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Memorandum

Date: March 7, 2025

To: City of Brea

From: Jason Brandman, Senior Vice President
FirstCarbon Solutions (FCS)

Subject: Addendum Memorandum for Modified Site Plan to the Brea Plaza Expansion Project Environmental Impact Report (SCH #2020079022)

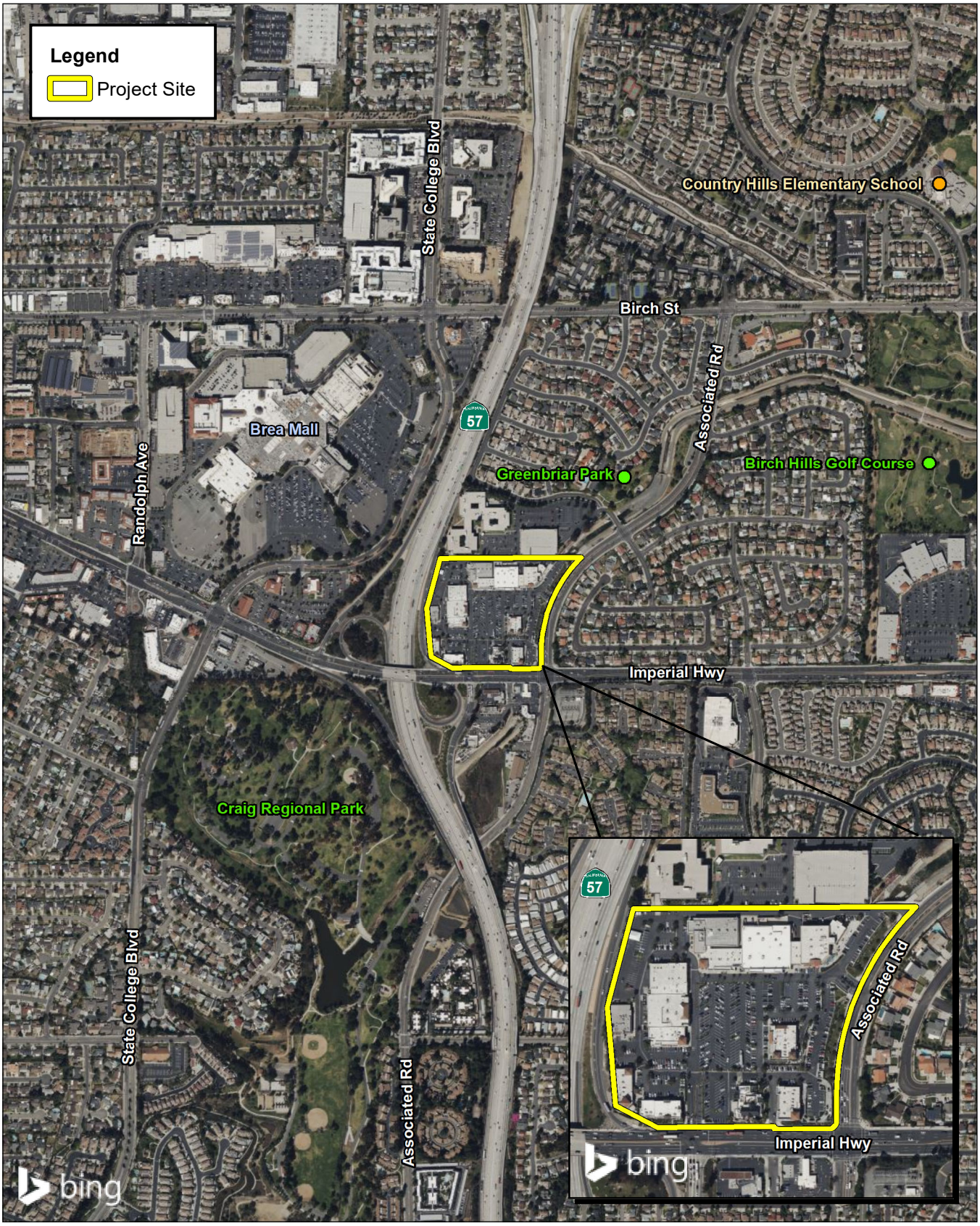
Project Location

The Project Site is the existing approximately 15.58-acre Brea Plaza Shopping Center (Brea Plaza), located at 1639 East Imperial Highway in the City of Brea (City), Orange County, California (Exhibit 1), with redevelopment proposed only on the approximately 1.7-acre area located in the northwest corner of the shopping center. The Project Site is associated with Assessor's Parcel Numbers (APNs) 319-391-01, 319-391-02, 319-391-03, and 319-391-04. The Project Site is bound by Greenbriar Lane and a vacant office building to the north, residential uses separated by Fullerton Creek drainage channel and South Associated Road to the east, Imperial Highway to the south, and State Route (SR) 57 to the west.

General Plan and Zoning

Brea Plaza features a mix of retail, restaurants, and service-oriented businesses. The Project Site has a General Plan Land Use designation of General Commercial and is zoned as General Commercial (C-G) with a Precise Development (PD) overlay by the City of Brea Zoning Map.[1] Surrounding zoning designations include C-G with a PD overlay to the north, Single-Family Residential (R-1) (across the Fullerton Creek drainage channel and South Associated Road) to the east, City of Fullerton (across Imperial Highway) to the south, and Mixed-Use I (MU-I) and Major Shopping Center (C-C) (across SR-57) to the west.

[1] City of Brea. 2024. Brea Zoning and Land Use. Website: https://brea.maps.arcgis.com/apps/webappviewer/index.html?id=d45bc07b4dc74935827c9c0b2d11de31. Accessed January 6, 2024.



Source: Bing Aerial Imagery, Orange County.

1,000 500 0 1,000 Feet

Exhibit 1
Local Vicinity Map

Procedural History

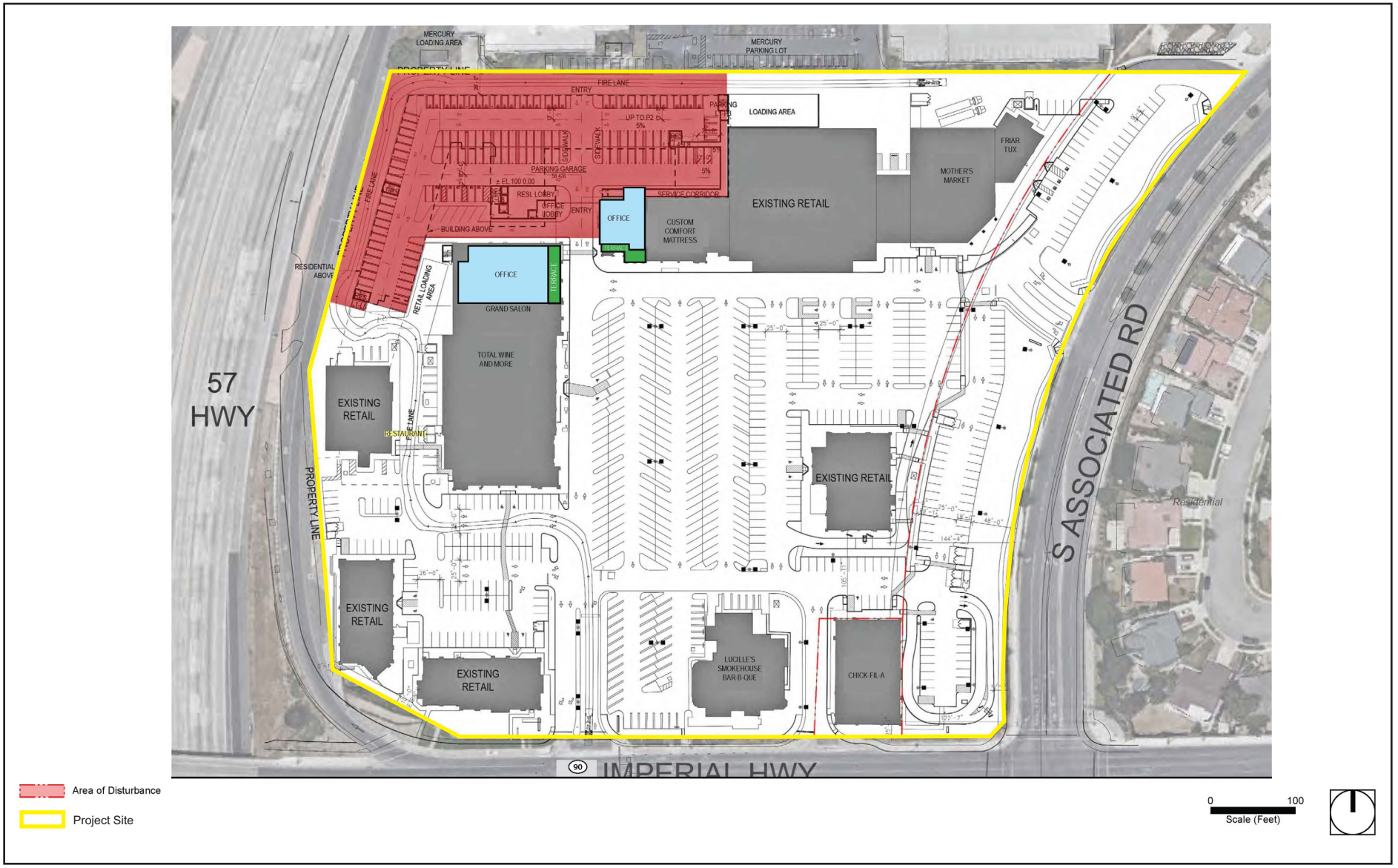
On April 19, 2022, the City of Brea certified the Brea Plaza Expansion Project Final Environmental Impact Report (certified FEIR) (State Clearinghouse [SCH] #2020079022)[2] by Resolution No. 2022-030 and approved Precise Development No. 2021-03 under Resolution No. 2022-031 of an approximately 187,477-square-foot mixed-use building comprising 189 residential units, 21,355 square feet of commercial space, and a parking garage (Exhibit 2). In addition, the City also approved a proposed modification of off-street parking requirements through Conditional Use Permit No. 2021-18 (Resolution No. 2022-032). The certified FEIR analyzed the demolition of the then-existing 18,450-square-foot Brea Plaza 5 Cinemas (1,110 seats), 139 surface parking spaces, and 21,355 square feet of office space and subsequent development of a new 5-story residential building atop a 3-story parking structure on approximately 1.7 acres in the northwestern portion of the approximately 16-acre Brea Plaza Shopping Center. Additional details regarding the Project evaluated in the certified FEIR are provided in Table 1 below.

On May 3, 2022, the City Council approved Resolution No. 2022-033 and adopted Ordinance No. 1226 for the mixed-use Project at Brea Plaza. Resolution No. 2022-033 approved General Plan Amendment No. 2021-04 to change the land use designation of the site from C-G to Mixed-Use II (MU-II). Ordinance No. 1226 approved Zone Change No. 2021-02 to change the zoning designation of the site from C-G to MU-II.

Opposition to the City's approvals was raised by the Brea Resident Advocacy PAC, which filed a referendum petition against Resolution No. 2022-033; following signature verification by the County Registrar of Voters, the City Clerk certified the petition's sufficiency. On July 19, 2022, the City Council reconsidered Resolution No. 2022-033 as required by Elections Code Sections 9237 and 9240. At that meeting, the City Council also considered a July 19, 2022, letter submitted by the Applicant requesting that the Brea Plaza Shopping Center be returned to its previous commercial zoning. Accordingly, the City Council adopted Resolution No. 2022-053 to repeal Resolution No. 2022-033 and rescind approval of General Plan Amendment No. 2021-04.

On August 16, 2022, the City Council adopted Ordinance No. 1231 repealing Ordinance No. 1226 to rescind approval of Zone Change No. ZC 2021-02 and approved Resolution No. 2022-062 repealing Resolution Nos. 2022-031 and 2022-032 to rescind approval of Precise Development No. 2021-03, Conditional Use Permit No. 2021-17, and Conditional Use Permit No. 2021-18. However, Resolution No. 2022-030, which certified the FEIR, was not repealed, and as such, the certification of the certified FEIR is still in place.

[2] California Environmental Quality Act (CEQA) State Clearinghouse (SCH). 2024. SCH Number 2020079022. Website: https://ceqanet.opr.ca.gov/Project/2020079022. Accessed February 11, 2025.



Source: PlaceWorks, 2021 & Architects Orange, 2021

Exhibit 2
Approved Project

On August 9, 2023, the Brea Planning Commission approved Precise Development No. 2022-02 (PC Resolution No. 2023-08) to allow the demolition of an existing 21,460-square-foot movie theater (Building F) and remodeling of Buildings E & G for retail ground floor use and new second floors for office use with outdoor patios. With the proposed addition of 14,827 square-foot, Building E will result in a 25,412-square-foot building with 18,372 square feet of first floor, and 7,040 square feet of second floor tenant space with a 3,028-square-foot outdoor patio. Building G would result in 8,480 square feet of second floor tenant space with a 1,048-square-foot outdoor patio (2023 Commercial Remodel). This approval for the 2023 Commercial Remodel on 2.2 acres of the Project site, was based on a finding that the action was exempt from CEQA pursuant to State CEQA Guidelines Section 15332 (Class 32). Construction is currently underway for a commercial addition to Building E only and parking lot reconfiguration.

Since the certification of the certified FEIR, the Project evaluated in the certified FEIR has been modified (Modified Project). An application for the Modified Project was submitted on March 19, 2024. The Modified Project includes General Plan Amendment No. 2024-01; Zone Change No. 2024-01; Density Bonus No. 2024-01; Precise Development No. 2024-01; and Conditional Use Permits Nos. 2024-03, 2024-04, and 2025-05. Additional details for the commercial area changes for the Project Site since the Certified FEIR as the result of 2023 Commercial Remodel project (Precise Development No. 2022-02) are included in Table 1 below and show a net reduction of 653 sq. ft. in commercial area at Brea Plaza compared to the Certified FEIR. It should be noted that with the Modified Project, 8,480 square-foot addition to Building G approved as part of the 2023 Commercial Remodel project will not occur and the Building G.

Table 1: Project History Commercial Square Footage Change

	Certified FEIR (approximate)	2023 Commercial Remodel (approximate)	Modified Project (approximate)	2023 Commercial Remodel Plus Modified Project
Commercial Addition	21,355 square feet	23,307 square feet Buildings E and G*	0	23,307 square feet
Commercial Demolition	(18,450 square feet) Building F–Brea Plaza 5 Cinemas**	(21,460 square feet) Building F–Brea Plaza 5 Cinemas**	(2,500 square feet) Building K	(23,960 square feet)
Total Change in Commercial Square Footage	2,905 square feet	1,847 square feet	(2,500 square feet)	(653 square feet)

Notes:

* With the Modified Project, 8,480 square-foot addition Building G will not occur.

** The difference in the square footage of Building F being demolished is due to the existing 3,010 square foot mezzanine space not being captured under Certified FEIR analysis.

Source: City of Brea March 2025

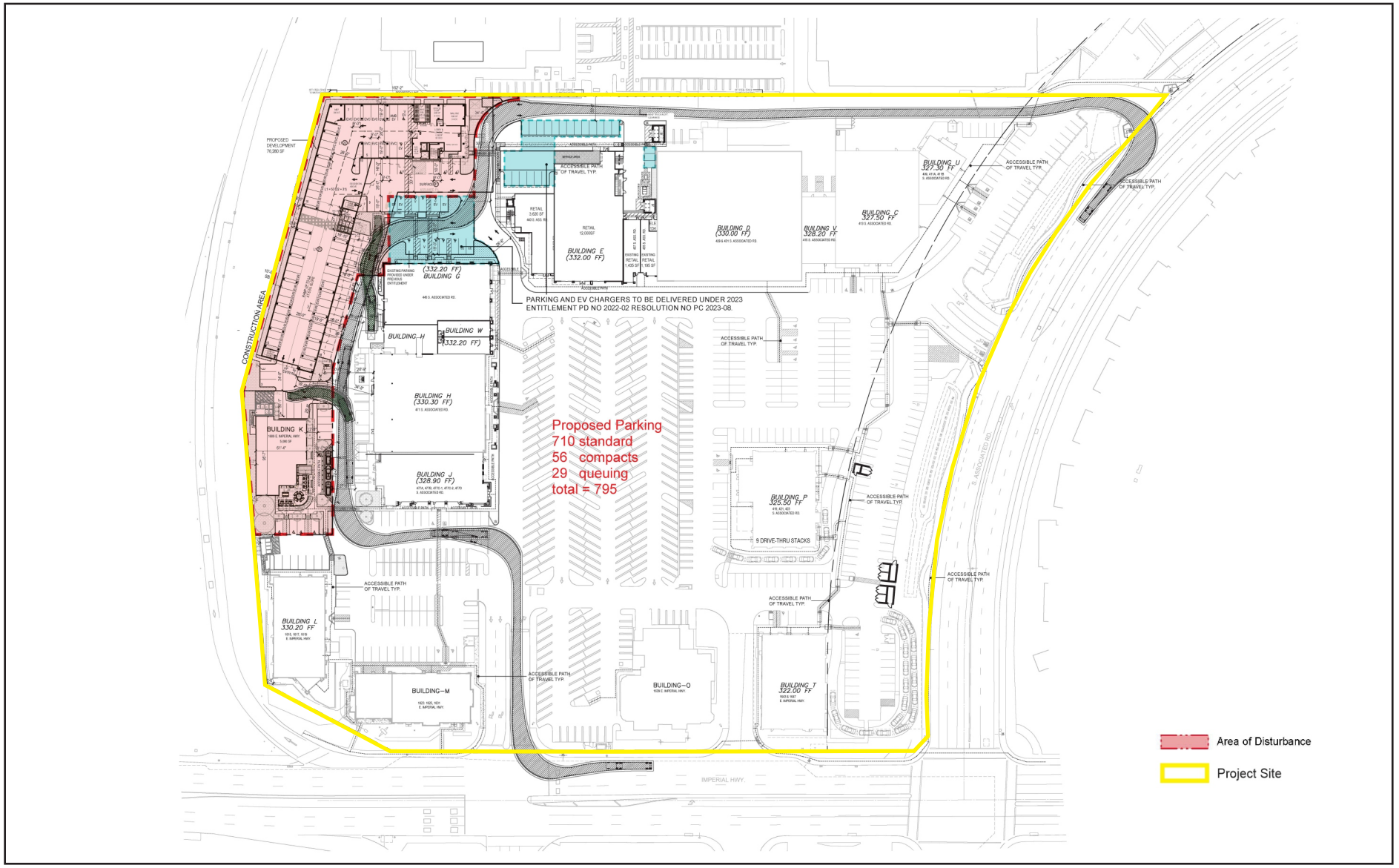
This Addendum Memorandum specifically compares the Modified Project (Exhibit 3) with the Project evaluated in the certified FEIR and analyzes whether the Modified Project would require further review under Section 15162 of the California Environmental Quality Act (CEQA) Guidelines. Pursuant to Section 15162, once an EIR has been certified for a project, “no subsequent EIR shall be prepared for that project unless,” based on substantial evidence:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or ND [Negative Declaration] due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or ND due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the ND was adopted shows any of the following:
    A. The project will have one or more significant effects not discussed in the previous EIR or ND;
    B. Significant effects previously examined will be substantially more severe than shown in the previous EIR or ND;
    C. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
    D. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR or ND would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative (CEQA Guidelines § 15162 (a); see also PRC § 21166).

Section 15164 (a) states that “The lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred.”

This Addendum Memorandum addresses the conclusions regarding impacts evaluated in the certified FEIR relative to the Modified Project and constitutes substantial evidence supporting the conclusion that preparation of a supplemental or subsequent EIR or ND is not required.

The following information summarizes the modified site plan and describes the reduced environmental impacts associated with the reduction in size and scope.



Source: AO Architects, 01/10/2025.

Exhibit 3
Modified Site Plan

Description of Modified Site Plan

This Addendum Memorandum includes a comparison of the Project evaluated in the certified FEIR and the Modified Project to determine whether the Modified Project is addressed in the certified FEIR. The following information summarizes the Modified Project.

The Modified Project includes the construction of a 4-story apartment building consisting of 120 units atop a 2-story aboveground parking structure. Units would consist of a mix of studio, one-bedroom, and two-bedroom units. The apartment building would also include a main lobby and office, mailroom, bike room, fitness center, community room, and outdoor terrace located on the top floor. The 2-story parking structure would include 95 parking stalls. The Modified Project would also include 76 electric vehicle (EV) capable, ready, and charging stations.[3]

As explained in this Addendum Memorandum, the changes reflected in the Modified Project constitute a reduction from the size and scope of the Project evaluated in the certified FEIR in terms of overall building size, footprint of disturbed area, unit count, and parking stalls. Overall, the proposed modifications would reduce impacts in multiple environmental topic areas. However, the evaluation of potential impacts in the certified FEIR remains accurate and none of the proposed changes would result in new significant impacts or an increase in the severity of any previously identified impacts or otherwise trigger the need for subsequent environmental review pursuant to Section 15162.

Table 2 presents a comparison of the key Project components associated with the Project evaluated in the certified FEIR and Modified Project.

Table 2: Comparison of Key Project Components

Component	Certified FEIR (approximate)	Modified Project (approximate)	% Change from Certified EIR (approximate)
Overall footprint of disturbed area (square feet)	95,832[1]	76,280	20.4% decrease
Total Square Footage	404,555[2]	162,071[3]	59.9% decrease
Total Residential Area (square feet)	222,447	118,620	46.7% decrease
Building Height to Stairs	89’0”	72’-4’’	18.7% decrease
Building Height to Parapet	89’0”	68’4”	23.2% decrease
Building Height to Top of Roof	89’0”	64’4”	27.7% decrease
Number of Floors	8[4]	6[5]	25.0% decrease
Office Space (square feet)	21,355	0	100% decrease

[3] Parking and Electric Vehicle chargers were processed under 2023 Precise Development No. 2022-02 Resolution No. PC 2023-08.

Component	Certified FEIR (approximate)	Modified Project (approximate)	% Change from Certified EIR (approximate)
Number of Residential Units	189[6]	120[7]	36.5% decrease
Parking Structure (square feet)	182,108	43,451	76.1% decrease
Total Parking Stalls	997	795	20.3% decrease
Parking Structure Parking Stalls	397	95	76.1% decrease
Electric Vehicle Capable, Ready, and Charging Stations	0	76	Added sustainable design feature

Notes:

[1] 2.2 acres noted in the certified FEIR equates to 95,832 square feet. The Modified Project would impact approximately 1.7 acres or 74,052 square feet.

[2] 222,447 square feet of residential + 182,108 square feet of parking garage (from certified FEIR).

[3] Includes 5,000 square feet of new restaurant rebuild.

[4] The certified FEIR evaluated a 5-story residential structure atop a 3-story parking structure.

[5] The Modified Project consists of four levels of residential (Levels 3-6) atop a 2-story parking structure.

[6] 15 of the units evaluated in the certified FEIR were three- and four-bedroom co-living bedrooms. The certified FEIR notes that co-living bedrooms are not generally counted as individual apartments. However, if the co-living unit bedrooms were counted as individual units, then the total apartment count goes to 229. The certified FEIR and associated technical analysis conservatively analyzed the impact of 229 units.

[7] Of the total 120 units, 6 are proposed to be affordable – Extremely Low-Income.

Sources: City of Brea. 2021.
BOSC Realty Advisors. 2024.

As shown in Table 2, the proposed modifications include an approximately 46.7 percent reduction in the total residential area to approximately 118,620 square feet (as compared 222,447 square feet) and a significant reduction in the total square footage (an approximately 59.9 percent decrease) attributable, in part, to a shift from a 5-story mixed-use building containing residential uses and a leasing office atop a 3-story parking structure, to a 4-story residential building atop a 2-story parking structure. Furthermore, the Modified Project would include a 36.5 percent decrease in the number of residential units proposed compared to the 189 units evaluated in the certified FEIR and a 47.6 percent decrease if compared to the 229 units conservatively analyzed by the certified FEIR.

The Modified Project also includes a full rebuild of the existing 7,500-square-foot building currently occupied by Buca di Beppo (referred to as Building K in the certified FEIR), including demolition of the existing 7,500-square-foot structure and construction of a smaller 5,000-square-foot building. The surrounding roadways and parking lot would also be modified. The restaurant would include three new Americans with Disabilities Act (ADA) parking stalls along its southern border, as well as four new parking stalls on its northeastern border.

The Modified Project would require the approval of General Plan Amendment No. 2024-01; Zone Change No. 2024-01; Density Bonus No. 2024-01; Precise Development No. 2024-01; and Conditional Use

Permit Nos. 2024-03, 2024-04, and 2025-05, to amend the General Plan and Zoning Designation for the approximately 15.58-acre Brea Plaza from C-G to MU-II.

The Project Applicant is also proposing a modification of the off-street parking requirements based on a shared parking analysis and a comprehensive sign program amendment to allow a building-mounted freeway-oriented sign for major shopping center tenants. Accordingly, while new entitlements for the Modified Project are needed because prior entitlements for the approved Project were rescinded at the Applicant's request, none of the changes proposed for the Modified Project would entail the intensification of development on any part of the Project Site; therefore, the analysis disclosed in the certified FEIR continues to apply to the Project as modified. Accordingly, under Section 15162, subsequent environmental review is not required.

State Density Bonus Law

California Government Code Section 65915 (California Senate Bill [SB] 1818, Chapter 928) (State Density Bonus Law) includes provisions requiring local governments to provide developers with a density increase over otherwise maximum allowable residential density (density bonus) and other incentives in exchange for the developer reserving sufficient units affordable to lower- or moderate-income households, as explained in Section 65915 (b) of the Government Code.

Per the City of Brea City Code (BCC) Section 20.258.010, Mixed-Use Zoning Districts, the MU-II zone allows a base residential density of 40 dwelling units per acre (du/ac). The affected parcels are together approximately 15.58 acres in size, yielding a maximum allowed density of 624 units.[4] Given the proposed 120 units as part of the Modified Project, the Modified Project would be well below the maximum allowable density. The Modified Project would provide six units as affordable to Extremely Low-Income residents, representing approximately 5 percent of the total units, which would qualify the Modified Project for the benefits and protections of the State Density Bonus Law, including an unlimited number of waivers from development standards that would physically preclude the Modified Project at the proposed density and one "concession or incentive" under Government Code Section 65915(k). As an incentive, the Applicant has requested exemption from the Brea Art in Public Places requirement that would otherwise apply to the Modified Project. Finally, the State Density Bonus Law allows qualifying projects to use a lower parking ratio, which the Applicant proposes using for the Modified Project.

The City has a local program that is also intended to encourage the development of affordable housing by offering "incentives" in exchange for reserving a sufficient percentage of units for lower- or moderate-income households. The Modified Project qualifies for this local program in addition to the State Density Bonus Law. Under the local program, the Applicant is requesting the following incentives:

- Deferral of development impact fees to Certificate of Occupancy

[4] The MU-II zone allows density to be applied across the Project Site rather than to the individual parcels. Therefore, given the 15.58 acre Project Site, the Modified Project's 120 units would equate to approximately 7.7 dwelling units per acre (du/acre), well below the maximum allowed of 40 du/acre. The 15.58 acre Project Site x 40 du/acre totals a maximum allowable density of 624 units.

Summary of the Brea Plaza Expansion Project FEIR Findings and Modified Project Impacts

The following is a brief summary of environmental impact areas and an evaluation regarding how the impacts identified in the certified FEIR would remain consistent or be reduced through implementation of the Modified Project. As noted further below in this memorandum, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impact, and it would not otherwise trigger the need for additional environmental review pursuant to Section 15162. Rather, the Modified Project would result in substantial reductions in construction-related and operational impacts in multiple environmental topic areas. Unless specifically noted, all mitigation identified in the certified FEIR would be applicable to the Modified Project (Attachment A).

Aesthetics, Light, and Glare

The Modified Project would be located within the same site as evaluated in the certified FEIR. The modified site plan shifts the orientation of the proposed building within the Project Site, but the Project Site would remain in the same location. The changes in the modified site plan reflect a reduction in the overall building size, height, and footprint as compared to the Project evaluated in the certified FEIR. The Modified Project would promote a similar aesthetic to that already evaluated in the certified FEIR with light beige, light and dark gray, and white stucco; wood and metal panels; as well as metal and glass railings, and the reduced building size and footprint of the modified site plan (Table 2) would harmonize the Modified Project with the surrounding development and ensure an appropriate scale and land use compatibility. The Modified Project would include a significant reduction in building height, from 89 feet to 69 feet and 4 inches, where development standards for the MU-II zoning district allow a maximum allowable building height of 100 feet.

The certified FEIR indicated that there are no scenic resources in the area that might be affected by the Project, so no impacts were identified. The certified FEIR determined a less than significant impact on scenic vistas, public views of the site and surroundings, and light and glare. The height, size, and footprint reduction of the Modified Project would further reduce an already less than significant impact. Moreover, despite this reduction, for purposes of a conservative analysis, the impact conclusions reflected in the certified FEIR would remain the same (Table 3). In accordance with the analysis in the certified FEIR, the Modified Project would use lighting consistent with the development standards and design guidelines of the General Plan and the BCC. Additionally, the glass element of the building's design would be installed with a visibility of 0.65, which would reduce glare and reflectivity, and ensure impacts remain less than significant. Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Project have been adequately analyzed and disclosed in the certified FEIR. All potential impacts related to aesthetics, light, and glare would be less than significant. The Modified Project would not cause new significant impacts not previously identified in the Brea Plaza Expansion Project FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed and no new mitigation measures are

necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to aesthetics, light, and glare associated with the Modified Project.

In summary, as shown in Table 3, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further environmental review under Section 15162 is not required.

Table 3: Impact Comparison–Aesthetics, Light, and Glare

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold AES-1*: Have a substantial adverse effect on a scenic vista?	None	LTS	None	LTS	Reduction
Threshold AES-2*: Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	None	No Impact	None	No Impact	No Change
Threshold AES-3*: In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	None	LTS	None	LTS	Reduction

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold AES-4*: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	None	LTS	None	LTS	Reduction

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Agricultural and Forest Resources

The certified FEIR identified that the Project Site is zoned C-G with a PD overlay and is listed as Urban and Built Up Land according to the California Department of Conservation (DOC) Farmland Mapping and Monitoring Program (FMMP).[5] The entirety of the Project Site is occupied by the existing Brea Plaza shopping center and does not support agricultural or forest uses; therefore, no forestland or agricultural land would be lost. The certified FEIR did not identify any conflicts with an existing Williamson Act Contract due to the site's C-G zoning designation. The certified FEIR found no significant impacts related to agricultural resources or forest resources. The Modified Project would be located within the same Project Site evaluated in the certified FEIR and therefore would also result in no impacts to agricultural resources or forest resources.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the Brea Plaza Expansion Project FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to agricultural and forest resources associated with the Modified Project.

[5] California Department of Conservation (DOC). 2025. California Important Farmland Finder. Website: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed January 24, 2025.

In summary, as shown in Table 4, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 4: Impact Comparison–Agricultural and Forest Resources

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold AG-1*: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	None	No Impact	None	No Impact	No Change
Threshold AG-2*: Conflict with existing zoning for agricultural use, or a Williamson Act contract?	None	No Impact	None	No Impact	No Change
Threshold AG-3*: Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	None	No Impact	None	No Impact	No Change
Threshold AG-4*: Result in the loss of forest land or conversion of forest land to non-forest use?	None	No Impact	None	No Impact	No Change
Threshold AG-5*: Involve other changes in the existing	None	No Impact	None	No Impact	No Change

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?					

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Air Quality, Greenhouse Gas Emissions, and Energy

Consistent with the analysis in the certified FEIR, the Modified Project would not exceed the South Coast Air Quality Management District's (AQMD) regional significance thresholds for criteria air pollutants and its expected growth is consistent with regional growth projections. Therefore, the Modified Project would not interfere with South Coast AQMD's ability to achieve the long-term air quality goals identified in South Coast AQMD's Air Quality Management Plan (AQMP). The Modified Project would still be required to achieve the current California Building Energy and Efficiency Standards and would be required to conform to the regulations outlined in the California Green Building Standards Code (CALGreen), as well as California Code of Regulations Title 13 Section 2449, which requires that nonessential idling of construction equipment is restricted to 5 minutes or less. Additionally, the Modified Project would still be subject to the rules and regulations of the South Coast AQMD, including Rules 403, 402, and 1113, which restrict fugitive dust, harmful emissions, and volatile organic compounds (VOC) in architectural coatings.

The Modified Project consists of a significant decrease in building size, unit count, and expected number of tenants, as well as the removal of the proposed office space previously analyzed in the certified FEIR. As such, greenhouse gas (GHG) emissions during construction and operation of the Modified Project would be reduced compared to what was evaluated in the certified FEIR. The certified FEIR determined that there would be a decrease in GHG emissions produced by Brea Plaza due to the demolition of the 1,100-seat movie theater on-site. As such, no significant impacts were identified related to the generation of GHG emissions or conflicts with plans policies or regulations adopted for the purpose of reducing GHG emissions. The Modified Project would still include the removal of the existing movie theater and would produce fewer construction and operational emissions than what was analyzed and disclosed in the certified FEIR.

The Modified Project would result in similar impacts related to the consumption of energy resources and would not conflict with a State or local plan for renewable energy or energy efficiency. The Modified Project would consume less energy than conservatively assumed in the certified FEIR during construction because of the substantial reductions in the total building square footage, footprint, building height, and resulting construction activity. In addition, the Modified Project operations would result in less energy consumption due to the reduction in building space and resulting electricity and natural gas consumption, the removal of the proposed office space, and less potable water demand and solid waste generation. The Modified Project would also result in fewer vehicle trips and expected Vehicle Miles Traveled (VMT) due to the reduction in the number of anticipated tenants and employees. The Modified Project would still be required to achieve the current California Building Energy Efficiency Standards and comply with the CALGreen.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the Brea Plaza Expansion Project FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the Brea Plaza Expansion Project FEIR fully and adequately addresses the potential impacts to air quality, greenhouse gas emissions, and energy associated with the Modified Project.

In summary, as shown in Table 5, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 5: Impact Comparison–Air Quality, Greenhouse Gases Emissions, and Energy

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold AQ-1*: Conflict with or obstruct implementation of the applicable air quality plan?	None	LTS	None	LTS	Reduction
Threshold AQ-2*: Result in a cumulatively considerable net increase of any criteria pollutant for which the Project	None	LTS	None	LTS	Reduction

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
region is non-attainment under an applicable federal or state ambient air quality standard?					
Threshold AQ-3*: Expose sensitive receptors to substantial pollutant concentrations?	None	LTS	None	LTS	Reduction
Threshold AQ-4*: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	None	LTS	None	LTS	Reduction
Threshold GHG-1*: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	None	No Impact	None	No Impact	No Change
Threshold GHG-2*: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	None	LTS	None	LTS	Reduction
Threshold E-1*: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?	None	LTS	None	LTS	Reduction
Threshold E-2*: Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	None	LTS	None	LTS	Reduction

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Biological Resources

The certified FEIR did not identify any significant impacts related to biological resources. The Project Site is developed with an existing shopping center and consists of primarily paved surfaces with ornamental landscaping and trees dispersed throughout the parking lot. The City does not have an ordinance protecting biological resources on private property, although street trees are protected under BCC Chapter 12.20. Since the Project Site is private property and the trees on-site are not considered street trees, the certified FEIR determined that there were no impacts related to conflicts with any local policies or ordinances protecting biological resources. The Project Site is not within a natural community conservation plan or habitat conservation plan area. The certified FEIR identified that, according to the National Wetlands Mapper, there is a 0.24-acre freshwater emergent wetland and 0.21-acre riverine on the eastern boundary of Brea Plaza that traverses the parking lot from the northern to the southern boundary. However, the western portion of the Project Site – where the Project would occur – is paved and developed. As with the project analyzed in the certified FEIR, no development associated with the Modified Project would occur on the eastern portion of the Project Site or in undeveloped areas of the site. Additionally, the Modified Project would implement plans, programs, and policies (PPP) BIO-1, which requires that in accordance with the California Fish and Game Code, any on-site trees that were to be removed would be removed outside of nesting season, either prior to February 15 or after August 15. The Modified Project would also be consistent with the California Fish and Game Code (Attachment A). The Modified Project would be located within the same Project Site analyzed in the certified FEIR and, as such, would not be located within a natural community conservation plan or habitat conservation plan area, nor would it include development near any wetlands or riparian habitats.

Overall, based on an examination of the analysis, findings, and conclusions of the Brea Plaza Expansion Project FEIR, the potential environmental impacts associated with the Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are

necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to biological resources associated with the Modified Project.

In summary, as shown in Table 6, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 6: Impact Comparison–Biological Resources

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold BIO-1*: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	None	No Impact	None	No Impact	No Change
Threshold BIO-2*: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	None	No Impact	None	No Impact	No Change
Threshold BIO-3*: Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	None	No Impact	None	No Impact	No Change

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold BIO-4*: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	None	No Impact	None	No Impact	No Change
Threshold BIO-5*: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	None	No Impact	None	No Impact	No Change
Threshold BIO-6*: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	None	No Impact	None	No Impact	No Change

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential “impacts” and “thresholds.” For purposes of this analysis, and to provide a thorough evaluation of the City’s thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Cultural Resources and Tribal Cultural Resources

While the Modified Project would result in substantially reduced overall square footage for the proposed structure, the Project Site would remain the same as evaluated in the certified FEIR. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential cultural and Tribal cultural resources (TCRs) due to ground disturbance impacts associated with the modified site plan.

According to the Cultural Resources Records Search conducted in support of the certified FEIR (Attachment B), no historical or archaeological resources were discovered in or around the Project Site. From as early as 1938 the Project Site was undeveloped, until 1976 when the existing retail center was constructed. The retail center experienced major renovations during the early to the mid-1990s consisting of the demolition of several of the original buildings, which were replaced with new buildings. In 2010, four additional buildings were constructed in the retail center. The certified FEIR indicated that no impacts would occur to historical resources and no mitigation measures required. The likelihood of disturbing archaeological resources was determined by the certified FEIR to be low, but since development of the site would require excavations below the current foundations, subsurface archaeological resources may be encountered. As such, the certified FEIR implemented Mitigation Measure (MM) CUL-1, which requires a qualified Archaeologist to evaluate any cultural resources that may be uncovered during ground-disturbing activities. With regard to human remains, the certified FEIR required compliance with California Health and Safety Code, Section 7050.5; CEQA Section 15064.5; and Public Resources Code, Section 5097.98, which mandate the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery. As such this impact was found to be less than significant.

In accordance with Senate Bill 18 (SB 18) and Assembly Bill 52 (AB 52), which require tribal consultation, the City contacted the 13 tribes identified by the Native American Heritage Commission (NAHC) as tribes potentially having local knowledge, about the approved project. Responses were received from the Gabrieleno Band of Mission Indians–Kizh Nation, Juaneño Band of Mission Indians Acjachemen Nation-Belardes, Agua Caliente Band of Cahuilla Indians, and Rincon Band of Luiseño Indians. Although the certified FEIR evaluated development within an existing shopping center and the likelihood of discovering significant TCRs would be low, development would involve ground-disturbing activities which may uncover previously undiscovered TCRs. As a result, the certified FEIR implemented mitigation measures MM TCR-1 and MM TCR-2, which require a Tribal monitor to be present on-site during ground-disturbing activities and set forth procedures to be taken in the event TCRs are discovered during construction.

The Modified Project would be located on the same Project Site as analyzed in the certified FEIR. Although the Modified Project would result in significantly reduced square footage as compared to what the certified FEIR conservatively analyzed, the Modified Project would still involve ground-disturbing activities that may uncover previously undiscovered cultural resources or TCRs during construction. Therefore, the impact determinations identified in the certified FEIR would remain relevant to the Modified Project and all mitigation measures implemented by the certified FEIR relating to cultural resources would be implemented by the Modified Project. In accordance with SB 18 and AB 52, an updated tribal consultation was conducted for the Modified Project, with responses received from the Gabrielino Tongva Indians of California and the Gabrieleno Band of Mission Indians–Kizh Nation. This consultation resulted in refinements to the wording of mitigations measures MM TCR-1 and MM TCR-2. Revisions were made to include an additional tribal monitor approved by the Gabrieleno Tongva Indians of California, and to provide guidance in the event that agreement cannot be reached between the consulting tribes as to the disposition of Tribal cultural materials should any be uncovered.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to cultural resources and Tribal cultural resources associated with the Modified Project.

In summary, as shown in Table 7, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 7: Impact Comparison–Cultural and Tribal Cultural Resources

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold C-1*: Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	None	No Impact	None	No Impact	No Change
Threshold C-2*: Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	CUL-1	LTS	CUL-1	LTS	Reduction
Threshold C-3*: Disturb any human remains, including those interred outside of dedicated cemeteries?	None	LTS	None	LTS	Reduction
Threshold TCR-1*: Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in	CUL-1, TCR-1, TCR-2	LTS	CUL-1, TCR-1, TCR-2	LTS	Reduction

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?					
Threshold TCR-2*: Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	CUL-1, TCR-1, TCR-2	LTS	CUL-1, TCR-1, TCR-2	LTS	Reduction

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Geology and Soils

According to the certified FEIR, there are no active faults in the vicinity of the Project Site and it is not located in a liquefaction zone or an area susceptible to landslides. Consistent with the analysis in the certified FEIR, the Modified Project's adherence to the regulations of the California Building Standards Code (CBC) would ensure that potential impacts from seismic ground shaking, expansive soils, and seismic-related ground failure would be reduced to a less than significant level. The certified FEIR also determined that implementation of construction best management practices (BMPs) would reduce any impacts from erosion to less than significant. The Project Site location and boundaries of the Modified Project would be consistent with the scope of the site evaluated in the certified FEIR. Therefore, the geologic and soil features identified in the certified FEIR would apply to the Modified Project as well.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to geology and soils associated with the Modified Project.

In summary, as shown in Table 8, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 8: Impact Comparison–Geology and Soils

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold GEO-1*: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42? ii. Strong seismic ground shaking? iii. Seismic-related ground failure, including liquefaction? iv. Landslides?	None	LTS	None	LTS	No Change
Threshold GEO-2*: Result in substantial soil erosion or the loss of topsoil?	None	LTS	None	LTS	No Change
Threshold GEO-3*: Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	None	LTS	None	LTS	No Change

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold GEO-4*: Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	None	LTS	None	LTS	No Change
Threshold GEO-5*: Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	None	No Impact	None	No Impact	No Change
Threshold CUL-3[1]: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	CUL-2	LTS	CUL-2	LTS	No Change

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Hazards and Hazardous Materials

Development associated with the Modified Project would be consistent with the analysis in the certified FEIR, only on a much smaller scale. The Modified Project would also be located on the same Project Site analyzed by the certified FEIR. The certified FEIR determined that with the exercise of normal safety practices and adherence to federal, State, and local regulations for the management and disposal of hazardous materials, impacts related to the release, transport, use, or disposal of hazardous materials or harmful emissions, including within a quarter-mile proximity to any schools, would remain less than significant. Consistent with the analysis in the certified FEIR, the Modified Project would be subject to the National Pollution Discharge Elimination System (NPDES) permit, requiring adherence to a Stormwater Pollution Prevention Plan (SWPPP), which would ensure impacts related to hazards to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment would remain less than significant. According to the certified

FEIR, the Project Site is also not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, within an airport land use plan or within 2 miles of a public use airport, or within a Fire Hazard Severity Zone (FHSZ) or Very High Fire Hazard Severity Zone (VHFHSZ). The location and boundaries of the Modified Project would be consistent with the analysis in the certified FEIR. Consistent with the analysis in the certified FEIR, the Applicant would be required to demonstrate compliance with zoning, building, and fire code requirements on final building plans for the Modified Project. Therefore, the Modified Project would have a less than significant impact on hazardous materials and hazardous materials sites, emergency response, or evacuation of wildfires.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to hazards and hazardous materials associated with the Modified Project.

In summary, as shown in Table 9, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 9: Impact Comparison–Hazards and Hazardous Materials

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold HAZ-1*: Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?	None	LTS	None	LTS	No Change
Threshold HAZ-2*: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of	None	LTS	None	LTS	No Change

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
hazardous materials into the environment?					
Threshold HAZ-3*: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	None	LTS	None	LTS	No Change
Threshold HAZ-4*: Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	None	LTS	None	LTS	No Change
Threshold HAZ-5*: For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles or a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project site?	None	No Impact	None	No Impact	No Change
Threshold HAZ-6*: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	None	LTS	None	LTS	Reduction
Threshold HAZ-7*: Expose people or structures, either directly or indirectly, to a	None	No Impact	None	No Impact	No Change

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
significant risk of loss, injury or death involving wildland fires?					

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Hydrology and Water Quality

Development associated with the Modified Project would be similar to that conservatively analyzed in the certified FEIR, only on a smaller scale. The Modified Project would also be located on the same Project Site analyzed by the certified FEIR. The Modified Project would include a similar storm drainage system to that analyzed in the certified FEIR. According to the Hydrology Report prepared in support of the certified FEIR (Attachment C), the proposed storm drain system would be able to convey the 2-year, 25-year, and 100-year storms while limiting outlet flows and satisfying all drainage requirements. Consistent with the analysis in the certified FEIR, the Modified Project would be required to adhere to existing programs and regulations related to water quality and would implement a SWPPP, as well as the BMPs detailed in the preliminary Water Quality Management Plan (WQMP) (Attachment D), thus reducing potential impacts related to runoff, stormwater system capacity, alteration of drainage patterns, or violation of water quality standards or waste discharge requirements. The Project Site is fully developed as a shopping center, and consistent with the analysis in the certified FEIR, the Modified Project does not propose groundwater wells that would extract groundwater from an aquifer, nor would the Modified Project affect recharge capabilities for the Coastal Plain of Orange County subbasin. Thus, a less than significant impact on groundwater recharge would occur. According to the certified FEIR, the Project Site is within Federal Emergency Management Agency (FEMA) Flood Insurance Map Zone "X," indicating a low risk of flood hazard occurring. The Project Site is also not within an area susceptible to tsunami, seiches, or mudflows and would not conflict with any water quality control plans or sustainable groundwater management plans.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to

reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to hydrology and water quality associated with the Modified Project.

In summary, as shown in Table 10, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 10: Impact Comparison–Hydrology and Water Quality

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold HYD-1*: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	None	LTS	None	LTS	No Change
Threshold HYD-2*: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	None	LTS	None	LTS	No Change
Threshold HYD-3*: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i. Result in a substantial erosion or siltation on- or off-site; ii. Substantially increase the rate or amount of surface runoff in a manner which	None	LTS	None	LTS	No Change

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
would result in flooding on- or off-site; iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv. Impede or redirect flood flows?					
Threshold HYD-4*: In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	None	LTS	None	LTS	No Change
Threshold HYD-5*: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	None	LTS	None	LTS	No Change

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Land Use and Planning

The Modified Project would ensure that any land use impacts remain less than significant by, among other things, further enhancing land use compatibility with surrounding uses and assuring consistency with relevant plans and policies. The Modified Project would provide a similar aesthetic to that analyzed in the certified FEIR but at a reduced height and scale. The Modified Project would still be located within the same site analyzed in the certified FEIR and, therefore, would not physically divide an established

community as the Project Site encompasses the existing Brea Plaza shopping center and the Modified Project does not propose any new structures that may block circulation to the surrounding areas.

The Modified Project would still include a zoning change and General Plan amendment to re-designate the Project Site to MU-II, which allows for a diverse range of complementary land uses in close proximity to one another. Either vertical or horizontal integration of uses is permitted, with an emphasis on tying together the uses with pedestrian linkages. The Modified Project includes similar uses to those evaluated in the certified FEIR, only on a smaller scale. As such, the Modified Project would still be consistent with the proposed land use designation and zoning for the Project Site. The Modified Project would also not conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental effects, considering all the changes in the Modified Project constitute a reduction in scale, overall footprint, height, and number of residential units.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to land use and planning associated with the Modified Project.

In summary, as shown in Table 11, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 11: Impact Comparison–Land Use and Planning

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold LU-1*: Physically divide an established community?	None	LTS	None	LTS	Reduction
Threshold LU-2*: Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	None	LTS	None	LTS	Reduction

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Mineral Resources

The certified FEIR identified no impacts associated with mineral resources. The Project Site is within mineral resource zone MRZ-1, which is an area in which adequate information indicates that no significant mineral deposits are present or likely to be present. Additionally, no mining sites are identified in the City of Brea General Plan, so development of the Modified Project would not cause a loss of availability of a mining site. The Modified Project would be within the same Project Site analyzed in the certified FEIR and, as such, would not result in any new impacts related to mineral resources.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to mineral resources associated with the Modified Project.

In summary, as shown in Table 12, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 12: Impact Comparison–Mineral Resources

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold M-1*: Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	None	No Impact	None	No Impact	No Change
Threshold M-2*: Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	None	No Impact	None	No Impact	No Change

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Noise

The Modified Project would result in similar construction and operational noise and vibration impacts compared to the analysis in the certified FEIR. Because the Modified Project would still consist of developing the same Project Site, the Modified Project would require a similar amount of grading and soil hauling from import and export of soils compared to what was assumed in the certified FEIR. However, because of the substantial reductions in the total building square footage, footprint, building height, shortened construction period associated with a smaller Project, and a corresponding reduction in construction equipment operation, the Modified Project would result in similar or reduced construction-related noise impacts. In terms of operational impacts, the reduced Project size, the removal of the proposed office space resulting in fewer employees, and a net decrease in vehicle trips would result in reduced ambient and transportation noise impacts compared to the Project analyzed in the certified FEIR.

In addition, because of the substantial reductions in the total building square footage, footprint, building height, unit count, shortened construction period associated with a smaller Project, and a corresponding reduction in construction equipment operation, the Modified Project would result in similar construction-related groundborne vibration impacts. And consistent with the analysis in the certified FEIR, the Modified Project would not create or cause any significant vibration impacts due to Project operations.

The Modified Project would result in the same impacts related to airport noise because the Project Site would not change locations, and the Modified Project would still be approximately 6.25 miles northeast of the closest airport.

As shown in Table 13, the Modified Project would not result in any new significant impacts nor would it increase the severity of any previously identified impacts. Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to noise associated with the Modified Project.

Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to noise associated with the Modified Project and further review under Section 15162 of the CEQA Guidelines is not required.

Table 13: Impact Comparison–Noise

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold N-1*: Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	None	LTS	None	LTS	Reduced
Threshold N-2*: Generation of excessive groundborne vibration or groundborne noise levels?	None	LTS	None	LTS	No Change
Threshold N-3*: For a Project located within the vicinity of a private airstrip or an airport	None	No Impact	None	No Impact	No Change

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, if the Project would expose people residing or working in the Project area to excessive noise levels?					

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Population and Housing

The certified FEIR evaluated development that would include 189 new housing units and add approximately 405 new residents and 49 new employees. The certified FEIR found that development would not induce substantial population growth in the area but would serve growth already projected in the City's General Plan. The Modified Project includes fewer housing units than evaluated in the certified FEIR and a reduced overall square footage and scale. As such, the Modified Project would also result in fewer residents and fewer employees than disclosed in the certified FEIR. Consistent with the analysis in the certified FEIR, the Modified Project would also not result in the displacement of people or housing since the Modified Project would be located on the same Project Site and would increase the available housing inventory within the City.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to population and housing associated with the Modified Project.

In summary, as shown in Table 14, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 14: Impact Comparison–Population and Housing

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold P-1*: Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	None	LTS	None	LTS	Reduction
Threshold P-2*: Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	None	No Impact	None	No Impact	No Change

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Public Services and Recreation

The certified FEIR found that any proposed population increase associated with the Project would be consistent with the projections of the City's General Plan and that impacts to fire protection, police protection, schools, parks, and other facilities would be less than significant with implementation of PPPs. These would include payment of development impact fees (PPP PS-2, PPP PS-6, PPP PS-8), payment of park development fees (PPP REC-1), offsetting costs associated with increased school capacity (PPP PS-9), adding design features to the Project to improve security and fire safety (PPP PS-5, PPP PS-7), review of Project plans by the City of Brea Fire Department (PPP PS-3), and compliance with the California Health and Safety Code and the BCC (PPP PS-1, PPP PS-4). The Modified Project would implement the same regulatory requirements and standard conditions of approval identified in the certified

FEIR and would include fewer housing units and commensurately lower population increase compared to the assumptions evaluated in the certified FEIR. Also consistent with the analysis in the certified FEIR regarding the Project, the Modified Project would not require mitigation measures. Thus, the Modified Project would reflect a reduction in severity of impacts related to the provision of public services.

The certified FEIR evaluated the development of an amenity deck and other recreational facilities on-site, which would reduce off-site recreational needs. The certified FEIR found these recreational facilities would have a less than significant impact on the environment. The Modified Project would include a 59.9 percent decrease in overall square footage, which would result in a smaller recreational area being constructed compared to what was previously analyzed in the certified FEIR. However, since the expected number of new residents would be significantly reduced as well, the Modified Project would correspond to a similar reduction in demand for recreation facilities and, therefore, would also result in fewer potential impacts to the environment as a result of the Modified Project. The Modified Project would still be required to pay park development impact fees as a condition of approval.

In summary, as shown in Table 15, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts. While the Modified Project's impact conclusions—less than significant—would remain the same as those disclosed in the certified FEIR, overall impact severity would be reduced.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to public services and recreation associated with the Modified Project.

Table 15: Impact Comparison–Public Services and Recreation

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold FP-1*: Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically	None	LTS	None	LTS	Reduction

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection services?					
Threshold PP-1*: Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection services?	None	LTS	None	LTS	Reduction
Threshold SS-1*: Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for school services?	None	LTS	None	LTS	Reduction

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold LS-1*: Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for library services?	None	LTS	None	LTS	Reduction
Threshold R-1*: Would increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	None	LTS	None	LTS	Reduction
Threshold R-2*: Includes recreational facilities or requires the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	None	LTS	None	LTS	Reduction

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential “impacts” and “thresholds.” For purposes of this analysis, and to provide a thorough evaluation of the City’s thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Transportation

The reduction in the overall square footage of the proposed building would result in a corresponding reduction in expected residents and full-time employees, which in turn would lead to a reduction in project-related trip generation and vehicle miles traveled (VMT) compared to that evaluated in the certified FEIR. The Traffic Circulation Assessment prepared in support of the certified FEIR analysis (Attachment E) found that the development would result in 7,283 daily trips, with 302 trips produced in the AM peak-hour and 516 trips produced in the PM peak-hour on a typical weekday, and 10,362 daily trips with 772 trips produced in the midday peak-hour on a typical Saturday.

With respect to the residential portion of the Project, the certified FEIR identified part of the trip counts for the proposed residential totaled 1,246 daily trips with 82 trips produced in the AM peak-hour and 101 trips produced in the PM peak-hour on a typical weekday, and 1,124 daily trips with 101 daily trips produced in the midday peak-hour on a typical Saturday. The certified FEIR also determined that there would be a less than significant impact related to VMT (Attachment F).

In 2023, the City considered the construction of 23,307 square feet of shopping center use on the Project site (2023 Commercial Remodel). To accompany this revision, and to support approval of this aspect of the Project, a memorandum to the traffic analysis prepared for the Project was completed by LSA (Attachment E). The memorandum concludes that no traffic impact would occur and that vehicle trips would be reduced compared to the existing Brea Plaza Shopping Center, as a result of the 2023 Commercial Remodel. Consistent with the conclusions regarding traffic associated with the 2023 Remodel, the Modified Project would result in similar impacts with respect to the Project site as those disclosed in the certified FEIR. However, because the Modified Project would include a reduction of 69 residential units and a reduction in commercial square footage than what was assessed in the Certified EIR, project-related trip generation and VMT impacts would be reduced compared to what the certified FEIR disclosed.

The certified FEIR analyzed potential development's consistency with the City's General Plan Circulation element, which contains policies promoting alternative transportation and adequate access to main roads, and determined that the Project would have a less than significant impact. The mix of horizontally integrated uses on the Project Site as reflected in the 2023 Remodel and the Modified Project, would de-emphasize the use of automobiles, and would connect residents, visitors and employees to opportunities to use public transportation through connection with sidewalks and bicycle lanes to the broader bus network. The Modified Project would protect and expand the existing pedestrian system in Brea Plaza and would provide bicycle parking on-site. As such, impacts related to potential conflicts with a program, plan, ordinance, or policy addressing the circulation system would remain less than significant.

Consistent with the analysis in the certified FEIR, the Modified Project would also ensure proper emergency access and would not include any design features of the internal circulation system that may result in hazardous conditions through standard permit review processes and approval by the City of Brea Fire Department. Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts

not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses and discloses the potential impacts to transportation associated with the Modified Project.

In summary, as shown in Table 16, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 16: Impact Comparison–Transportation

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold T-1*: Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	None	LTS	None	LTS	Reduction
Threshold T-2*: Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	None	LTS	None	LTS	Reduction
Threshold T-3*: Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	None	LTS	None	LTS	Reduction
Threshold T-4*: Result in inadequate emergency access?	None	LTS	None	LTS	Reduction

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential “impacts” and “thresholds.” For purposes of this analysis, and to provide a thorough evaluation of the City’s thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Utilities and Service Systems

The approximate 59.9 percent reduction in the overall square footage of the proposed building associated with the Modified Project and the 36.5 percent reduction in proposed residential units, compared to what was evaluated in the certified FEIR, would result in a corresponding reduction in utility demands, including, among others, water usage, stormwater, and solid waste generation. According to the Sewer Study incorporated into the certified FEIR (Attachment G.1), Brea Plaza currently produces a total of 75,446 gallons per day (gpd) of wastewater at the Project Site, and the proposed apartment and office uses would generate approximately 49,660 gpd. The certified FEIR determined that existing sewer and wastewater treatment facilities would have adequate capacity to support the new demand evaluated in the certified FEIR. Similarly, according to the Sewer Study prepared for the Modified Project (Attachment G.2), all existing sewer and wastewater treatment facilities would have adequate capacity to support the Modified Project. According to the Sewer Study prepared for the Modified Project, Brea Plaza currently produces a total of 66,598 gallons per day (gpd) of wastewater at the Project Site, and the new proposed development would add approximately 33,342 gpd to the existing sewer system. However, since the existing Buca di Beppo would be demolished, the 12,084 gpd it produces would be deducted, for a net total of an additional approximately 21,258 gpd (compared to the approximately 49,660 gpd analyzed in the certified EIR). As such, the Modified Project would result in reduced flows compared to what was previously evaluated in the certified FEIR. Additionally, the Applicant would still be required to pay Sanitary Sewer Connection fees.

Consistent with the analysis in the certified FEIR, the Modified Project would include the installation of new water lines on the Project Site which would connect to existing City water infrastructure. The proposed system would be constructed in accordance with the City's requirements for pipe sizing, flows, pressure, and flow duration. Furthermore, the City has established water rates to cover costs of purchasing water supplies to operate and maintain the water distribution system. The City is also projected to meet all water demands through the year 2045, and the growth induced by the Modified Project would be within projected demand. Also consistent with the analysis in the certified FEIR, the Modified Project would employ structural and nonstructural BMPs to reduce impacts associated with stormwater runoff and would include a storm drainage system able to convey the 2-year, 25-year, and 100-year storms while limiting outlet flows and satisfying drainage requirements (see Attachment C, Hydrology Report). The certified FEIR disclosed that development would produce solid waste within the capacity of the Olinda Alpha Landfill, which serves the area. The Modified Project would produce less waste than the certified FEIR evaluated due to the reduced building size and would also comply with solid waste disposal requirements, including requirements to divert solid waste from landfills through recycling, reuse on the Project, or salvage for future use or sale.

Overall, based on an examination of the analysis, findings, and conclusions of certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to

reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to utilities and service systems associated with the Modified Project.

In summary, as shown in Table 17, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 17: Impact Comparison–Utilities and Service Systems

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold U-1*: Would exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	None	LTS	None	LTS	Reduction
Threshold U-2*: Would require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	None	LTS	None	LTS	Reduction
Threshold U-3*: Would require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	None	LTS	None	LTS	Reduction
Threshold U-4*: Would not have sufficient water supplies available to serve the Project from existing entitlements and resources, and new and/or expanded entitlements would be needed?	None	LTS	None	LTS	Reduction

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold U-5*: Would result in a determination by the wastewater treatment provider which serves or may serve the Project that has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	None	LTS	None	LTS	Reduction
Threshold U-6*: Would be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs?	None	LTS	None	LTS	Reduction
Threshold U-7*: Would not comply with federal, state, and local statutes and regulations related to solid waste?	None	LTS	None	LTS	Reduction

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Wildfire

The certified FEIR found less than significant impacts related to wildfire associated with the Project Site. The Project Site was not found to be within any FHSZs or State Responsibility Areas (SRAs). The certified FEIR determined that development on the Project Site was not found to pose a risk of exposing occupants to wildfire risk due to slope, prevailing winds, and other factors since the Project Site is within a relatively flat, urbanized area and would not impact weather or topography. As such, the Project Site was also not found to expose people or structures to landslide risks or downslope flooding. Furthermore, the certified FEIR determined that development on the Project Site was not found to impact any emergency response plans or to require the installation or maintenance of infrastructure that would exacerbate fire risk.

The Modified Project would be located within the same Project Site previously analyzed in the certified FEIR. The Modified Project would also include similar development to that evaluated in the certified FEIR but with reduced building height, scale, and total square footage. As such, the Modified Project would not result in any new or more severe impacts.

Overall, based on an examination of the analysis, findings, and conclusions of the certified FEIR, the potential environmental impacts associated with the Modified Project have been adequately analyzed and disclosed in the certified FEIR. The Modified Project would not cause new significant impacts not previously identified in the certified FEIR and would not result in a substantial increase in the severity of previously identified significant impacts. The Modified Project would result in the same, or reduced, impacts compared to what was already analyzed, and no new mitigation measures are necessary to reduce significant impacts. Thus, the evaluation in the certified FEIR fully and adequately addresses the potential impacts to wildfire associated with the Modified Project.

In summary, as shown in Table 18, the Modified Project would not result in any new significant impacts, nor would it increase the severity of any previously identified impacts, and further review under Section 15162 is not required.

Table 18: Impact Comparison–Wildfire

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
Threshold W-1*: Substantially impair an adopted emergency response plan or emergency evacuation plan?	None	LTS	None	LTS	Reduction
Threshold W-2*: Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	None	LTS	None	LTS	Reduction
Threshold W-3*: Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources,	None	LTS	None	LTS	Reduction

Impact	Brea Plaza Expansion Project FEIR		Modified Project		Overall Change in Impact Severity
	Mitigation Measure	Level of Significance After Mitigation	Mitigation Measure	Level of Significance After Mitigation	
power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?					
Threshold W-4*: Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	None	LTS	None	LTS	Reduction

Notes:
LTS = Less than significant impact
* The certified FEIR identifies both potential "impacts" and "thresholds." For purposes of this analysis, and to provide a thorough evaluation of the City's thresholds of significance with respect to the Modified Project, potential impacts will be evaluated using the thresholds identified in the certified FEIR.

Conclusion

The discussion above confirms that the Modified Project has been fully and adequately evaluated for significant impacts pursuant to CEQA in a certified FEIR and none of the conditions for preparation of a subsequent EIR in accordance with Section 15162 apply. Additionally, as discussed throughout this Addendum Memorandum, all applicable mitigation measures as detailed in the project-specific MMRP (Attachment A), regulatory requirements, standard conditions of approval, and Project design features identified in the certified FEIR to avoid and reduce impacts would be integrated into the Modified Project and, with the integration of these measures, the Modified Project would not substantially degrade the quality of the environment, have impacts that are individually limited but cumulatively considerable, or have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly.

Since the April 19, 2022, certification of the certified FEIR, no substantial changes have occurred in the circumstances under which the Project would be implemented that would change the severity of the project's physical impacts, as explained above. No new information of substantial importance meeting the criteria listed in State CEQA Guidelines Section 15162 has been identified. Furthermore, as demonstrated

in this Addendum Memorandum, the Modified Project would not result in any new significant environmental impacts, result in any substantial increases in the significance of previously identified effects, or necessitate implementation of additional or considerably different mitigation measures than those identified in the certified FEIR, nor would the Modified Project render feasible any mitigation measures or alternatives previously found not to be feasible. The effects of the Modified Project would be substantially the same or less than those reported in the certified FEIR. The Modified Project would not contribute considerably to cumulative effects that were not already accounted for in the certified FEIR. Overall, the findings made by the City in certifying the certified FEIR remain applicable to the Modified Project. Consistent with Section 15162, the analysis presented in this Addendum Memorandum, combined with the certified FEIR's analysis and evaluation, demonstrates that the Modified Project's impacts have been considered in the certified FEIR that was reviewed and certified by the City Council and the certified FEIR provides a sufficient and adequate analysis of the environmental impacts of the Modified Project. As such, further analysis of the Modified Project for purposes of CEQA is not required.

Attachments:

Attachment A–Mitigation Monitoring and Reporting Program
Attachment B–Cultural Resources Records Search
Attachment C–Hydrology Report
Attachment D–Water Quality Management Plan
Attachment E–Traffic Circulation Assessment
Attachment F–VMT Assessment
Attachment G–Sewer Studies
- G.1–FEIR Sewer Study
- G.2–Modified Project Sewer Study

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Mitigation Monitoring and Reporting Program

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Mitigation Monitoring and Reporting Program for the Modified Site Plan to the Brea Plaza Expansion Project Environmental Impact Report City of Brea, Orange County, California

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PREFACE

Section 21081.6 of the California Environmental Quality Act (CEQA) and CEQA Guidelines Section 15097 require a Lead Agency to adopt a Mitigation Monitoring and Reporting Program (MMRP) whenever it certifies an Environmental Impact Report (EIR) in conjunction with a project approval. The purpose of the MMRP is to ensure compliance with the mitigation measures occurs during project implementation.

Pursuant to CEQA Guidelines Public Resources Code Section 21000, *et seq*., an EIR was certified and a MMRP was adopted by the City of Brea (City) on April 19, 2022 (Brea Plaza Expansion Project Final Environmental Impact Report, State Clearinghouse [SCH] No. 2020079022).

The Addendum Memorandum prepared for the proposed modified site plan (modified project) concluded that project implementation would be consistent with the development evaluated in the EIR and further identified relevant mitigation measures required by the EIR that are applicable to the modified project. This project-specific MMRP documents how and when the relevant mitigation measures adopted by the Lead Agency as part of the MMRP for the EIR, as well as certain project-specific enforceable conditions of approval and/or refinements to related aspects of implementation for the same, will be implemented for the modified project and ensures that potential environmental impacts associated with the proposed project are consistent with the impact conclusions set forth in the EIR as identified and explained more fully in the Addendum Memorandum.

This document does not discuss those subjects that the environmental analysis demonstrates would result in less than significant impacts and for which no applicable mitigation was proposed in the EIR, nor does it address mitigation measures in the EIR that are not applicable to the proposed project.

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Table 1: Modified Project Mitigation Monitoring and Reporting Program

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
I. Aesthetics, Light, and Glare						
PPP AES-1	The proposed project is required to provide a minimum landscaped coverage of 15 percent of the net site area in accordance with municipal code Section 20.258.020, General Development Standards for the Mixed-Use Zoning Districts.	Project Applicant	Prior to issuance of building permits.	City of Brea Planning Division		
PPP AES-2	For parking areas, the proposed project is required to maintain an equivalent of one foot-candle of illumination on the average throughout the parking area. The lighting is required to be on a timeclock or photo-sensor system. The lighting shall be designed to confine direct rays to the premises. No spillover beyond the property line shall be permitted in accordance with municipal code Section 20.08.040(C)(5), Lighting.	Project Applicant	Prior to issuance of building permits.	City of Brea Planning Division		
PPP AES-3	All lighting, interior and exterior, shall be designed and located so as to confine all direct rays to the premises in accordance with municipal code Section 20.220.040(L), Lighting. Lighting for nonresidential uses shall be appropriately designed, located, and shielded to ensure that they do not negatively impact the residential uses in compliance with Section 20.08.040(C)(5).	Project Applicant	Prior to issuance of building permits.	City of Brea Planning Division		
PPP AES-4	Signs shall be located in a manner to ensure that sight distance is not impaired at any locations for vehicular traffic to and from the premises, in accordance with municipal code Section 20.28, Signs. The Brea Plaza comprehensive sign program will be amended, subject to Planning Commission approval. The proposed signage for the Brea Plaza Shopping Center on the residential building requires review by the Planning Commission to ensure that its size, location, content, coloring, or manner of illumination does not constitute a traffic hazard or a detriment to traffic safety by obstructing the vision of drivers, or detracting from the visibility of any official traffic control device, or by diverting or tending to divert the attention of drivers of moving vehicles from the traffic movement on the public streets and highway. Pursuant to Municipal Code Section 20.28.230, Sign Illumination, the approval of any illuminated sign shall not be final until 30 days after installation, during which period the Community Development Director or his or her designee may order the dimming of any illumination found to be excessively brilliant.	Project Applicant	Prior to issuance of building permits.	City of Brea Planning Division		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
PPP AES-5	Loading areas for nonresidential uses shall be located as far as possible from residential units and shall be completely screened from view from the residential portion of the project and streets, in compliance with subsections 20.236.040(E), Walls and Fences, and 20.220.040(F), Fences, Walls, and Hedges, and subparagraph K. Screening and buffering standards for loading areas shall be compatible in architectural design and details with the overall project. The location and design of loading areas shall mitigate nuisances from odors when residential uses might be impacted, in accordance with subsection 20.258.030(I)(3), Loading Areas.	Project Applicant	Prior to issuance of building permits.	City of Brea Planning Division		
PPP AES-6	Recycling and refuse storage facilities for nonresidential uses shall be as far as possible from residential units and shall be completely screened from view from the residential portion of the project and streets in compliance with the standards in subsections 20.236.040(E), Walls and Fences, and 20.220.040(F), Fences, Walls, and Hedges, and subparagraph K, Screening and Buffering. Recycling and refuse storage facilities for nonresidential uses should be compatible in architectural design and details with the overall project. The location and design of trash enclosures shall mitigate nuisances from odors when residential uses might be impacted, in accordance with the standards in subsection 20.258.030(J), Recycling and Refuse Storage Facilities.	Project Applicant	Prior to issuance of building permits.	City of Brea Planning Division		
PPP AES-7	In accordance with Section 20.258.030(D), Specific Development Standards for all Mixed-Use Projects, of the Brea Municipal Code, the architectural style and use of quality materials shall be consistent throughout the entire project; however, differences in architectural details and/or materials may occur to differentiate between the nonresidential and residential portions of the project.	Project Applicant	Prior to issuance of building permits.	City of Brea Planning Division		
PPP AES-8	In accordance with Section 20.258.030(D)(3.F), Specific Development Standards for all Mixed-Use Projects, of the Brea Municipal Code, the design of the residential portion of the project shall be consistent with the design guidelines for multi-family residential development. In accordance with Section 20.258.030(A)(2), Specific Development Standards for all Mixed-Used Projects MU-I Zoning Districts, of the Brea Municipal Code, nonresidential and residential uses shall be vertically integrated whenever possible; however, stand-alone residential projects and stand-alone nonresidential projects are allowed when planned and designed as an integrated element of a larger mixed-use development area.	Project Applicant	Prior to issuance of building permits.	City of Brea Planning Division		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
II. Air Quality						
PPP AIR-1	New buildings are required to achieve the current California Building Energy and Efficiency Standards (Title 24, Part 6) and California Green Building Standards Code (CALGreen) (Title 24, Part 11). The 2022 Building and Energy Efficiency Standards became effective January 1, 2023. The Building Energy and Efficiency Standards and CALGreen are updated tri-annually with a goal for nonresidential buildings to achieve zero net energy by 2030.	Project Applicant	Prior to issuance of building permits.	City of Brea Building and Safety Division		
PPP AIR-2	New buildings are required to adhere to the California Green Building Standards Code (CALGreen) requirement to provide bicycle parking for new buildings, or meet local bicycle parking ordinances, whichever is stricter .	Project Applicant	Prior to issuance of building permits.	City of Brea Building and Safety Division		
PPP AIR-3	New buildings are required to adhere to the applicable California Green Building Standards Code (CALGreen) mandatory measures for indoor air quality and to provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a Minimum Efficiency Reporting Value (MERV) of MERV 13 filters as deemed necessary and/or in effect at the time of building permit issuance.	Construction contractor	During construction activities	City of Brea Building and Safety Division		
PPP AIR-4	Construction activities will be conducted in compliance with California Code of Regulations Title 13 Section 2449, which requires that nonessential idling of construction equipment is restricted to five minutes or less.	Construction contractor	During construction activities	City of Brea Building and Safety Division		
PPP AIR-5	Construction activities will be conducted in compliance with any applicable South Coast Air Quality Management District rules and regulations, including but not limited to: • Rule 403, Fugitive Dust, for controlling fugitive dust and avoiding nuisance. • Rule 402, Nuisance, which states that a project shall not "discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property." • Rule 1113, which limits the volatile organic compound content of architectural coatings.	Construction contractor	During construction activities	City of Brea Building and Safety Division		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
III. Biological Resources						
PPP BIO-1	In compliance with the California Fish and Game Code, birds and their active nests are protected; therefore, the trees on-site would be removed outside of the nesting season, either prior to February 15 or after August 15.	Project Applicant	During site preparation and grading activities.	City of Brea Building and Safety Division		
IV. Cultural Resources						
PPP CUL-1	Native American historical and cultural resources and sacred sites are protected under PRC Sections 5097.9 to 5097.991, which require that descendants be notified when Native American human remains are discovered and provide for treatment and disposition of human remains and associated grave goods.	Qualified Archaeologist and Project Applicant	Prior to issuance of grading permits and during construction activities	City of Brea Planning Division		
PPP CUL-3	Adverse impacts to paleontological resources from developments on public lands (state, county, city, and district) require reasonable mitigation. (PRC Section 5097.5)	Qualified Archaeologist and Project Applicant	Prior to issuance of grading permits and during construction activities	City of Brea Planning Division		
PPP CUL-4	If human remains are discovered within a project site, disturbance of the site must stop until the coroner has investigated and made recommendations for the treatment and disposition of the human remains to the person responsible for the excavation, or to his or her authorized representative. If the coroner has reason to believe the human remains are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission. (California Health and Safety Code Section 7050.5)	Tribal Monitor, Qualified Archaeologist, and Project Applicant	During site-grading activities	City of Brea Planning Division, Project Applicant		
CUL-1	If cultural resources are encountered during ground-disturbing activities, work in the immediate area shall cease, and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service 1983) shall be contacted immediately to evaluate the find(s). If the discovery proves to be significant under CEQA, additional work, such as data recovery excavation and the preparation of an Archaeological Resources	Qualified Archaeologist and Project Applicant	During ground disturbing activities	City of Brea Planning Division		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
	Treatment Plan prepared by the qualified archaeologist in consultation with the City, may be warranted and will be reported to the City.					
V. Energy						
PPP E-1	New buildings are required to achieve the current California Building Energy Efficiency Standards (Title 24, Part 6) and California Green Building Standards Code (CALGreen) (Title 24, Part 11). The 2022 Building Energy Efficiency Standards became effective on January 1, 2023. The Building Energy Efficiency Standards and CALGreen are updated tri-annually with a longer-term goal to achieve zero net energy.	Project Applicant	Prior to issuance of building permits	City of Brea Engineering Division		
PPP E-2	New buildings are required to adhere to the California Green Building Standards Code (CALGreen) requirement to provide bicycle parking for new non-residential buildings, or meet local bicycle parking ordinances, whichever is stricter (CALGreen Sections 5.106.4.1, 14.106.4.1, and 5.106.4.1.2).	Project Applicant	Prior to issuance of building permits	City of Brea Building and Safety Division		
PPP E-3	California's Green Building Standards Code (CALGreen) requires the recycling and/or salvaging for reuse at minimum of 65 percent of the nonhazardous construction and demolition waste generated during most "new construction" projects (CALGreen §§ 4.408 and 5.408). Construction contractors are required to submit a construction waste management plan that identifies the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project, or salvaged for future use or sale and the amount (by weight or volume).	Project Applicant	Prior to issuance of building permits and during construction.	City of Brea Engineering Division		
PPP E-4	Construction activities are required to adhere to Title 13 California Code of Regulations Section 2499, which requires that nonessential idling of construction equipment is restricted to five minutes or less.	Project Applicant	Prior to issuance of building permits	City of Brea Building and Safety Division		
PPP E-5	New buildings are required to adhere to the California Green Building Standards Code and Water Efficient Landscape Ordinance requirements to increase water efficiency and reduce urban per capita water demand.	Project Applicant	Prior to issuance of building permits	City of Brea Building and Safety Division		
VI. Geology and Soils						
PPP CUL-2	The removal, without permission, of any paleontological site or feature is prohibited from lands under the jurisdiction of the state or any city, county, district, authority, or public corporation or any agency thereof (PRC Section	Qualified Archaeologist	Prior to issuance of grading permits and	City of Brea Planning Division		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
	5097.5). This applies to agencies' own activities, including construction and maintenance, and permit actions by others.	and Project Applicant	during construction activities			
CUL-2	Monitoring of mass grading and excavation activities in the areas identified as likely to contain paleontological resources by a qualified paleontologist who meets the standards of the Society of Vertebrate Paleontology. A paleontologist shall be on call in the event that paleontological resources are found during ground-disturbing activities. The paleontologist shall be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments that are likely to contain the remains of small fossils. The paleontologist shall be empowered to temporarily halt or divert equipment to allow for the removal of abundant or large specimens in a timely manner, and comply with the standard procedures listed by the Society of Vertebrate Paleontology Impact Mitigation Guidelines Revision Committee.	Qualified Archaeologist and Project Applicant	During ground disturbing activities	City of Brea Planning Division		
VII. Greenhouse Gas Emissions						
PPP GHG-1	New buildings are required to achieve the current California Building Energy Efficiency Standards (Title 24, Part 6) and California Green Building Standards Code (CALGreen) (Title 24, Part 11). The 2022 Building Energy Efficiency Standards will become effective on January 1, 2023. The Building Energy Efficiency Standards and CALGreen are updated tri-annually with a longer-term goal to achieve zero net energy.	Project Applicant	Prior to issuance of building permits.	City of Brea Engineering Division		
PPP GHG-2	New buildings are required to adhere to the California Green Building Standards Code (CALGreen) requirement to provide bicycle parking for new buildings, or meet local bicycle parking ordinances, whichever is stricter. Development of the project would require provision of anchored bicycle racks and long-term secured bicycle parking.	Project Applicant	Prior to issuance of building permits.	City of Brea Engineering Division		
PPP GHG-3	California's Green Building Standards Code (CALGreen) requires the recycling and/or salvaging for reuse at minimum of 65 percent of the nonhazardous construction and demolition waste generated during most "new construction" projects (CALGreen §§ 4.408 and 5.408). Construction contractors are required to submit a construction waste management plan that identifies the construction and demolition waste materials to be diverted from disposal by	Project Applicant	Prior to issuance of building permits and during construction.	City of Brea Engineering Division		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
	recycling, reuse on the project, or salvaged for future use or sale and the amount (by weight or volume).					
PPP GHG-4	Construction activities are required to adhere to California Code of Regulations, Title 13, Section 2449, which requires that nonessential idling of construction equipment be restricted to five minutes or less.	Project Applicant and Project Construction Contractor	During construction and operations	City of Brea Engineering Division		
PPP GHG-5	New buildings are required to adhere to the California Green Building Standards Code and Water Efficient Landscape Ordinance requirements to increase water efficiency and reduce urban per capita water demand.	Project Applicant	Prior to issuance of building permits.	City of Brea Building and Safety Division		
VII. Land Use and Planning						
PPP LU-1	As part of the project review process, the City of Brea is requiring that the project applicant prepare a parking study.	Project Applicant	Prior to issuance of building permits.	City of Brea Building and Safety Division		
VIII. Noise						
PPP NOI-1	Project-related construction activity will be limited to the hours of 7:00 am to 7:00 pm on weekdays and Saturdays. Construction is prohibited on Sundays.	Project Applicant	During construction activities	City of Brea Building and Safety Division		
PPP NOI-2	The project will comply with City of Brea's stationary exterior noise standards.	Project Applicant	During operation	City of Brea Building and Safety Division		
PPP NOI-3	The project will comply with the City of Brea's vibration standards of 70 VdB at the property line of the sensitive receptor.	Project Applicant	During operation	City of Brea Building and Safety Division		
PPP NOI-4	The residential development will comply with the California Building Code (CBC), Title 24, Part 2, Volume 1, Chapter 12, Interior Environment, Section 1207.11.2, Allowable Interior Noise Levels. Nonresidential development will comply with the CBC, Title 24, Building Standards Administrative Code, Part 11, CALGreen.	Project Applicant	During operation	City of Brea Building and Safety Division		
PPP NOI-5	Outdoor nonresidential uses in mixed-use projects shall be prohibited from operating between the hours of 10:00 p.m. and 7:00 a.m. in accordance with Section 20.258.030 (H)(1) Hours of Operation of the Brea Municipal Code.	Project Applicant	During operation	City of Brea Planning		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
				Division, Police Department		
PPP NOI-6	The covenants, conditions, and restrictions of a mixed-use project shall indicate the times when the loading and unloading of goods may occur on the street, provided that in no event shall loading or unloading take place after 10:00 p.m. or before 7:00 a.m. on any day of the week in accordance with Section 20.258.030 (H)(3) Loading and Unloading Activities, of the Brea Municipal Code.	Project Applicant	During operation	City of Brea Planning Division		
PPP NOI-7	Residents of a mixed-use development project shall be notified in writing before taking up residence that they will be living in an urban type of environment and that the noise levels may be higher than a typical residential area. The covenants, conditions, and restrictions of a mixed-use project shall require that the residents acknowledge their receipt of the written noise notification. Their signatures shall confirm receipt and understanding of this information in accordance with Section 20.258.030 (H)(4) Noise Notification, of the Brea Municipal Code.	Project Applicant	Prior to issuance of an occupancy permit. During leasing.	City of Brea Building Division, Project Applicant		
PPP NOI-8	Residential dwelling units shall be designed to be sound attenuated against present and future project noise. New projects or new nonresidential uses in existing projects shall provide an acoustical analysis report, by an acoustical engineer, describing the acoustical design features of the structure required to satisfy the exterior and interior noise standards in accordance with Section 20.258.030 (H)(6) Sound Mitigation, of the Brea Municipal Code.	Project Applicant	Prior to issuance of a building permit	City of Brea Building and Safety Division		
PPP NOI-9	Noise-generating equipment. Noise-generating equipment (e.g., refrigeration units, air conditioning, exhaust fans, etc.) shall require special consideration in their location and screening in order to avoid creating a nuisance in accordance with Section 20.258.030 (K)(3) Noise Generating Equipment.	Project Applicant	Prior to issuance of a building permit and during operation	City of Brea Building and Safety Division		
IX. Population and Housing						
PPP POP-1	The project is required to adhere the City's Affordable Housing Ordinance (Municipal Code Chapter 20.40), which requires developers of residential projects with 10 or more units to provide a percentage of 5-30% affordable units depending on provided affordability level of required units or pay an in-lieu fee.	Project Applicant	Prior to issuance of an occupancy permit. During leasing.	City of Brea Planning Division, Project Applicant		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
X. Public Services						
PPP PS-1	New buildings are required to meet the fire regulations outlined in California Health and Safety Code (Sections 13000 et seq.).	Project Applicant	Prior to issuance of a building permit	City of Brea Fire Department		
PPP PS-2	The project applicant is required to pay development impact fees (dispatch impact fees, fire impact fees, fire service fees).	Project Applicant	Prior to issuance of a building permit	City of Brea Building and Safety Division		
PPP PS-3	As part of the project review process, the City of Brea Fire Department will require approval of Building Plan Check for Site Plan and Emergency Access as well as approval of Fire Master Plan. Additional design features to address the City of Brea Fire Department's requirements will be incorporated as conditions of approval for the project.	Project Applicant	Prior to issuance of a building permit	City of Brea Fire Department		
PPP PS-4	The project will be designed, built, and operated in accordance with the City of Brea's Municipal Code Chapter 15.08 Building Code and Chapter 16.04 Brea Fire Code.	Project Applicant	Prior to issuance of a building permit	City of Brea Building and Safety Division and City of Brea Fire Department		
PPP PS-5	As part of the project review process, the City of Brea Fire Department may require project design features for fire safety. Additional design features to address the City of Brea Fire Department's service standards will be incorporated as conditions of approval for the project, such as funding for a new ladder truck to responsibly maintain its response requirements, provide adequate protection for this project and its intended residents, and aid in the overall execution of the Brea Fire Department's mission.	Project Applicant	Prior to issuance of an occupancy permit	City of Brea Police Department		
PPP PS-6	The project applicant is required to pay dispatch impact fees.	Project Applicant	Prior to issuance of a building permit	City of Brea Building and Safety Division		
PPP PS-7	As part of the project review process, the City of Brea Police Department may require project design features to improve security. Additional design features to address the City of Brea Police Department's service standards will be incorporated as conditions of approval for the project, such as:	Project Applicant	Prior to issuance of a building permit	City of Brea Police Department		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
	• ALPR (license plate reader system), • Fiber optic cable to connect to existing fiber network, • Funding for mixed mounted cameras for a citywide camera system which is currently under development.					
PPP PS-8	Pursuant to AB 2926, new development is required to pay development impact fees to assist in providing school facilities to serve students generated by new development.	Project Applicant	Prior to issuance of a building permit	City of Brea Building and Safety Division		
PPP PS-9	Pursuant to SB 50, new development is required to offset the costs associated with increasing school capacity, where the funds collected go to acquiring school sites, constructing new school facilities, and modernizing existing school facilities.	Project Applicant	Prior to issuance of a building permit	City of Brea Building and Safety Division		
XI. Recreation						
PPP REC-1	The proposed project is required to comply with Brea Municipal Code Section 18.64.080 that establishes the subdivision regulations for the provision of park and recreational facilities through land dedication, installation of improvements, payment of in-lieu fee thereof, or a combination. New development is required to fund park and recreational development and improvements through the payment of park development fees.	Project Applicant	Prior to issuance of a building permit	City of Brea Building and Safety Division		
XII. Transportation						
PPP TRAF-1	The proposed project is required to pay development impact fees to the City of Brea pursuant to the City's AB 1600 Transportation Improvement Nexus Program (Ordinance 996). Based on a transportation improvement nexus program study conducted in 2011, the City Council adopted Resolution 2011-096, which updated the impact fees, effective February 4, 2012. Fair-share fees offset or mitigate the cumulative traffic impacts caused by new development. The program ensures all future development in the City of Brea contributes on a fair-share basis.	Project Applicant	Prior to issuance of a building permit	City of Brea Engineering Division		
PPP TRAF-2	Modifications to the roadway network, including driveways, curbs, and sidewalks, are subject to approval of the City of Brea. Construction work within the right-of-way of a public roadway requires the issuance of a permit by the City of Brea.	Project Applicant	Prior to issuance of a building permit	City of Brea Engineering Division		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
PPP TRAF-3	The proposed project is required to implement the following bicycle safety improvements as a condition of approval. The project shall restripe the west leg of the intersection of South Associated Road at Birch Street to provide an exclusive east-bound right-turn pocket. To implement this improvement, the existing traffic signal at South Associated Road and Birch Street shall be modified to allow for an eastbound right-turn overlap phase. In addition, the existing R73- 5(CA) sign for the northbound left-turn lanes shall be replaced with a R73-6(CA) sign to restrict U-turns in the northbound direction.	Project Applicant and City of Brea Public Works Department	Prior to issuance of an occupancy permit	City of Brea Public Works Department		
XIII. Tribal Cultural Resources						
PPP TCR-1	Pursuant to California Health and Safety Code Section 7050.5, if human remains are discovered on the project site, disturbance of the site shall halt and remain halted until the coroner has conducted an investigation. If the coroner determines that the remains are not subject to his or her authority and has reason to believe that they are those of a Native American, he or she shall contact the NAHC by telephone within 24 hours.	Tribal Monitor, Qualified Archaeologist, and Project Applicant	During site-grading activities	City of Brea Planning Division, Project Applicant		
TCR-1	Prior to the commencement of any ground disturbing activity within the Project area, the Applicant shall retain two total Native American Monitors, each approved by the tribes that consulted on this Project pursuant to Assembly Bill 52 and Senate Bill 18 (the "Tribe" or the "Consulting Tribe"), and in concurrence with the City of Brea as the CEQA lead agency. The Applicant shall coordinate with each of the Consulting Tribes to develop an executed contract to pay for tribal monitors to be present during ground-disturbing activities. Prior to the issuance of any permit necessary to commence a ground-disturbing activity, a copy of the executed contract shall be submitted to the City of Brea Community Development Department. • The Tribal monitors will only be present on-site and on off-site portions of the area included as part of the Project grading or improvement permits during the construction phases that involve ground-disturbing activities. Ground-disturbing activities are defined by the Tribes as activities that may include, but are not limited to, pavement removal, potholing or auguring, grubbing, tree removals, boring, grading, excavation, drilling, and trenching, within the Project area.	Tribal Monitor and Project Applicant	Prior to issuance of grading permit	City of Brea Planning Division, Project Applicant		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
	• The Tribal Monitors shall complete daily monitoring logs that provide descriptions of the day's activities, including construction activities, locations, soil, and any cultural materials identified. • The monitoring shall be concluded when all ground-disturbing activities within the Project area are completed, or when the Tribal Representatives and Tribal Monitors have indicated that all upcoming ground-disturbing activities have little to no potential for impacting Tribal Cultural Resources.					
TCR-2	If tribal cultural resources are inadvertently discovered during ground disturbing activities for this Project. The following procedures will be carried out for treatment and disposition of the discoveries: • Upon discovery of any Tribal Cultural Resources, construction activities shall cease in the immediate vicinity of the find (not less than the surrounding 100 feet) until the find can be assessed. • All Tribal Cultural Resources unearthed by Project activities shall be evaluated by the qualified archaeologist and Tribal monitors approved by the Consulting Tribes. If the resources are Native American in origin, Consulting Tribes will share finds with one another and will retain it/them in the form and/or manner the Tribes deems appropriate, for educational, cultural and/or historic purposes. If agreement cannot be reached as to the disposition of cultural materials, they shall be curated at Western Science Center by default. • If human remains and/or grave goods are discovered or recognized at the Project Site, all ground disturbance shall immediately cease within 100 feet of the discovery, and the county coroner shall be notified per Public Resources Code Section 5097.98, and Health & Safety Code Section 7050.5. Human remains and grave/burial goods shall be treated alike per California Public Resources Code section 5097.98(d)(1) and (2). • Work may continue on other parts of the Project Site while evaluation and, if necessary, mitigation takes place (CEQA Guidelines Section 15064.5[f]). If a non-Native American resource is determined by the qualified archaeologist to constitute a "historical resource" or "unique archaeological resource," time allotment and funding sufficient to allow for implementation of avoidance measures, or appropriate mitigation, must be available. The treatment plan established for the resources shall be in accordance with CEQA Guidelines	Project Applicant and Qualified Archaeologist	During ground disturbing activities	City of Brea Planning Division, Project Applicant		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
	Section 15064.5(f) for historical resources and PRC Sections 21083.2(b) for unique archaeological resources. • Preservation in place (i.e., avoidance) is the preferred manner of treatment. If preservation in place is not feasible, treatment may include implementation of archaeological data recovery excavations to remove the resource along with subsequent laboratory processing and analysis. Any historic archaeological material that is not Native American in origin shall be curated at a public, non-profit institution with a research interest in the materials, such as the Natural History Museum of Los Angeles County or the Fowler Museum, if such an institution agrees to accept the material. If no institution accepts the archaeological material, it shall be offered to a local school or historical society in the area for educational purposes.					
XIV. Utilities and Service Systems						
PPP USS-1	The project will pay the Sanitary Sewer Connection Fees collected by the City of Brea, which contribute to maintenance and installation of sewer improvements in the OCSD in accordance with Section 3.32.040, Sewer Service Fees and Charges, of the Brea Municipal Code.	Project Applicant	Prior to issuance of a building permit	City of Brea Engineering Division		
PPP USS-2	The project will pay the water impact fees and water connection fees collected by the City of Brea, which covers costs to purchase water supplies and to operate and maintain the water distribution system in accordance with Ordinance 967.	Project Applicant	Prior to issuance of a building permit	City of Brea Engineering Division		
PPP USS-3	Landscaping installed on-site shall conform to the California Green Building Standards Code and Water Efficient Landscape Ordinance requirements to increase landscape water efficiency.	Project Applicant	Prior to issuance of a building permit and during construction	City of Brea Building and Safety, Planning Division		
PPP USS-4	Plumbing fixtures installed on-site shall conform to California Green Building Standards Code requirements to increase water efficiency and reduce urban per capita water demand.	Project Applicant	Prior to issuance of a building permit and during construction	City of Brea Building and Safety		

PPP #	Mitigation Measures	Responsible for Implementation	Timing	Responsible for Monitoring	Verification of Completion	
					Date	Initial
PPP USS-5	The project would comply with the City's water conservation program during a drought or emergency situation, in accordance with Chapter 13.20, Water Management Program, of the City's Municipal Code.	Project Applicant	Prior to issuance of a building permit and during construction	City of Brea Engineering Division		
PPP USS-6	The project will be constructed and operated in accordance with the Santa Ana Regional Water Quality Control Board Municipal Stormwater (MS4) Permit for Orange County. The MS4 Permit requires the proposed project to prepare and implement a WQMP to: • Control release of contaminants into storm drain systems. • Educate the public about stormwater impacts. • Detect and eliminate illicit discharges. • Control runoff from construction sites. • Implement BMPs and site-specific runoff controls and treatments.	Project Applicant	Prior to issuance of a building permit and during construction	City of Brea Engineering Division		
PPP USS-7	California's Green Building Standards Code (CALGreen) requires the recycling and/or salvaging for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste generated during most "new construction" projects (CALGreen Sections 4.408 and 5.408). Construction contractors are required to submit a construction waste management plan that identifies the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project, or salvage for future use or sale and the amount (by weight or volume).	Project Applicant	Prior to issuance of a building permit and during construction	City of Brea Engineering Division		
PPP USS-8	The project will abide by AB 341 and AB 1826. The project will store and collect recyclable materials in compliance with AB 341. Green waste will be handled in accordance with AB 1826.	Project Applicant	Prior to issuance of a building permit and during construction	City of Brea Engineering Division		
Notes: Any PPPs that are not applicable to the proposed project are not addressed in this table.						

FCS
An ADEC Innovation

[redacted]

Cultural Resources Records Search

[redacted]

South Central Coastal Information Center
California State University, Fullerton
Department of Anthropology MH-426
800 North State College Boulevard
Fullerton, CA 92834-6846
657.278.5395
California Historical Resources Information System
Los Angeles, Orange, Ventura and San Bernardino Counties
sccic@fullerton.edu

9/17/2020 SCCIC File #: 21583.7795

Jasmine A. Osman
PLACEWORKS
3 MacArthur Place, Suite 1100
Santa Ana, CA 92707

Re: Record Search Results for the Brea Plaza Shopping Center – 1639 East Imperial Highway in the City of Brea

The South Central Coastal Information Center received your records search request for the project area referenced above, located on the La Habra and Yorba Linda, CA USGS 7.5' quadrangles. The following summary reflects the results of the records search for the project area and a ½-mile radius. The search includes a review of all recorded archaeological and built-environment resources as well as a review of cultural resource reports on file. In addition, the California Points of Historical Interest (SPHI), the California Historical Landmarks (SHL), the California Register of Historical Resources (CAL REG), the National Register of Historic Places (NRHP), and the California State Built Environment Resources Directory (BERD) listings were reviewed for the above referenced project site and a ¼-mile radius. Due to the sensitive nature of cultural resources, archaeological site locations are not released.

RECORDS SEARCH RESULTS SUMMARY

Archaeological Resources* (*see Recommendations section)	Within project area: 0 Within project radius: 2
Built-Environment Resources	Within project area: 0 Within project radius: 0
Reports and Studies	Within project area: 2 Within project radius: 12
OHP Built Environment Resources Directory (BERD) 2019	Within project area: 0 Within ¼-mile radius: 0
California Points of Historical Interest (SPHI) 2019	Within project area: 0 Within ¼-mile radius: 0
California Historical Landmarks (SHL) 2019	Within project area: 0 Within ¼-mile radius: 0
California Register of Historical Resources (CAL REG) 2019	Within project area: 0 Within ¼-mile radius: 0
National Register of Historic Places (NRHP) 2019	Within project area: 0 Within ¼-mile radius: 0
Archaeological Determinations of Eligibility (ADOE): 2012	Within project area: 0 Within project radius: 0

HISTORIC MAP REVIEW - Anaheim, CA (1896, 1942) 15' USGS historic maps indicate that in 1896 there was no visible development within the project area or the project search radius. In 1942, there was still no visible development within the project area. There were several roads and buildings within the project search radius which was located within the historic place name of Brea. The Fullerton Reservoir was located south of the project area.

RECOMMENDATIONS

*When we report that no archaeological resources are recorded in your project area or within a specified radius around the project area; that does not necessarily mean that nothing is there. It may simply mean that the area has not been studied and/or that no information regarding the archaeological sensitivity of the property has been filed at this office. The reported records search result does not preclude the possibility that surface or buried artifacts might be found during a survey of the property or ground-disturbing activities.

The archaeological sensitivity of the project location is unknown because there are no previous studies for the subject property. Additionally, the natural ground-surface appears to be obscured by urban development; consequently, surface artifacts would not be visible during a survey. While there are currently no recorded archaeological sites within the project area, buried resources could potentially be unearthed during project activities. Therefore, customary caution and a halt-work condition should be in place for all ground-disturbing activities. In the event that any evidence of cultural resources is discovered, all work within the vicinity of the find should stop until a qualified archaeological consultant can assess the find and make recommendations. Excavation of potential cultural resources should not be attempted by project personnel. It is also recommended that the Native American Heritage Commission be consulted to identify if any additional traditional cultural properties or other sacred sites are known to be in the area. The NAHC may also refer you to local tribes with particular knowledge of potential sensitivity. The NAHC and local tribes may offer additional recommendations to what is provided here and may request an archaeological monitor.

For your convenience, you may find a professional consultant**at www.chrisinfo.org. Any resulting reports by the qualified consultant should be submitted to the South Central Coastal Information Center as soon as possible.

**The SCCIC does not endorse any particular consultant and makes no claims about the qualifications of any person listed. Each consultant on this list self-reports that they meet current professional standards.

If you have any questions regarding the results presented herein, please contact the office at 657.278.5395 Monday through Thursday 9:00 am to 3:30 pm. Should you require any additional information for the above referenced project, reference the SCCIC number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System,

Stacy St. James

Stacy St. James

Digitally signed by Stacy St. James
Date: 2020.11.02 09:19:41 -08'00'

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the California Historical Resources Information System (CHRIS) Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

FCS
An ADEC Innovation

Attachment C:

Hydrology Report

CA ENGINEERING, INC.

Planning • Engineering • Surveying

PRELIMINARY HYDROLOGY REPORT

FOR

Brea Plaza Apartments
1639 E. Imperial Highway
Brea, CA 92821

Preparation Date: January 8, 2025
Revision Date: February 20, 2025

PLANS PREPARED UNDER THE SUPERVISION OF:

2-20-25

Fred Cornwell, P.E. - R.C.E 45591 Date

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1.0 SITE

1.1 Description

Existing Site

The existing site is a retail center consisting of eight buildings and associated drive aisles and parking lots. The drainage for the project generally surface flows from the northwest to the southeast before being collected and conveyed by an on-site storm drain system to the Loftus Channel located along the eastern side of the site. A previous redevelopment of the center in 2011 constructed four concrete box culverts that replace the previous open trapezoidal channel allowing parking lots to be constructed over the box culverts. The site is currently under construction reconfiguring a couple of buildings and the associated perking fields.

The low flows for the new construction are collected in low flow grates and conveyed to a Modular Wetlands system that filters the low flows and then conveys them to the overall site BMP's.

These BMP's consist of by 12" grated area drains at each catch basin location, and are then conveyed to vegetated swales located along the eastern boundary. These low flows are bio-treated by the vegetated swales and then directed to a drainage inlet that discharges to the Loftus box channel. Flows that exceed design storm flows are collected by the catch basins and conveyed directly to the Loftus Channel.

There are off-site flows coming onto the existing shopping center from the northerly property. The roof tributary areas have been determined by aerial imagery since access was denied.

Proposed Site

The proposed project consists of redeveloping 1.77 acres of the approximately 13.7 acre existing retail site known as the Brea Plaza. The proposed project will involve the demolition of An existing restaurant (Buca Di Beppo) as well as the asphalt drive aisles/parking areas, concrete walkways, and landscaped planters within the project area, and the construction of one apartment building, a restaurant and the associated parking lot.

The drainage patterns will remain consistent with the existing drainage patterns. There will be a new low flow area drain system that will capture the flows leaving the new construction area. This system will convey the flows to a Modular Wetland system to treat the flows. This unit will treat the flows and then will be connected to an existing drain pipe that connects to catch basin located to the southeast in the middle of the existing shopping center.

1.2 Methodology

The hydrologic calculations for the study were completed using AES software based on the Orange County Hydrology Manual methods. The Rational Method was used to determine the peak discharges for the pre- and post-developed conditions.

In the hydrology calculations, we determined the flows for both the existing and proposed conditions. The sub areas and combined flows are shown on the hydrology maps in Exhibits A & B, while the output results are included in Appendix A & B of this report.

The existing hydrology map shows Point A that is downstream of the proposed redevelopment. This point as shown on the existing hydrology map correlates to node 3 as shown on the proposed hydrology map.

In addition, the catch basin inlet filters will be sized to meet Water Quality Management Plan (WQMP) requirements.

1.3 Results

Hydrology Calculations

The values below are for the 2, 25 and 100 year storm events at the previously mentioned common downstream point "A"

Point "A"	2 Year	25 year	100 Year
Existing	9.61 CFS	21.34 CFS	27.61 CFS
Proposed	9.19 CFS	20.47 CFS	26.51 CFS
Decrease (CFS) / %	0.42CFS / 4.4%	0.87 CFS / 4.1%	1.10 CFS / 4.0%

The proposed conditions result in a decrease of flows at Point "A" due to the increase of the flow path.

The low flows will be filtered through the Modular Wetlands and then connected to the existing catch basin. This will increase the time of concentration resulting in a reduction of flows so they will not be included in the analysis.

Low flow / catch basin calculations

We will analyze the pre and post flows at this point to determine the impact the proposed redevelopment will have on the existing drainage.

To determine the flows to the Low flow inlets we determined the on and off site tributary sub-areas to each inlet. The sub-areas are shown on the hydrology map. We will calculate the 1 year / 1 hour flows to each inlet to confirm the inlet filters have the capacity. These sub-areas are S1= 2.12 ac & S2= 1.50 ac.

Flows to each inlet can be calculated by the equation Q=CIA where:
C=(0.75 * 90% impervious) + 0.15 = 0.825
I = 0.457 in/hr (NAOO output)
INLET 1: Q=(0.825 * 0.457*2.12) = 0.80 CFS
INLET 2: Q=(0.825 * 0.457*1.50) = 0.57 CFS

The proposed inlet filters (FloGard Plus FGP 21F & FloGard Plus FGP 18F) have a filter capacity of 1.0 cfs (inlet 1) & 0.7 cfs (inlet 2) respectively which exceeds the treatment flows. For more information on the catch basin filters and modular wetlands BMPs, see the separate WQMP report.

Hydromodification

For projects in North Orange County, Appendix I.4 of the Technical Guidance Document states that:

"Hydrologic Conditions of Concerns (HCOCs) are considered to exist if any streams located

downstream from the project are determined to be potentially susceptible to hydromodification impacts and either of the following conditions exists:

- Post-development runoff volume for the 2-yr, 24-hr storm exceeds that of the pre-development[4] condition by more than 5 percent

OR

- Time of concentration of post-development runoff for the 2-yr, 24-hr storm event is greater[5] than the time of concentration of the pre-development condition by more than 5 percent."

Appendix I.4 of the Technical Guidance Document further provides that if excess runoff volume from the 2-yr, 24-hr runoff event cannot feasibly be retained, the project shall "implement on-site or regional hydromodification controls such that the post- development runoff 2-yr, 24-hr peak flow rate is no greater than 110 percent of the pre- development runoff 2-yr, 24-hr peak flow rate."

With respect to the proposed project, not all of the downstream conveyance channels from the point of connection are "engineered, hardened, and regularly maintained to ensure design flow capacity." Therefore, the project has the potential for an HCOC. However, as set forth in the table below, the post-development run-off volume and time of concentration are within 105% of these values for the pre-development condition when assessing compliance at the location where runoff leaves the project site. These values were obtained utilizing the WinTR-55 Program (as required by Appendix IV.2 of the TGD). Copies of the WinTR-55 Program Hydrologic Analysis Reports are included in Appendix C.

[4] In North Orange County (Order R8-2009-0030), predevelopment is defined as the existing conditions immediately prior to Project WQMP submittal.

[5] The North County Permit (Order R8-2009-0030), as adopted, provides the option of reducing Tc to less than the existing condition Tc (within 5 percent) as part of the primary and preferred option for mitigating HCOCs. However, a longer Tc is generally associated with natural conditions than urban conditions, and a longer Tc nearly universally results in lower concern for hydromodification impacts. In addition, it is not physically possible for a project to implement BMPs consistent with LID provisions of the permit without substantially increasing the Tc of the site. The use of retention BMPs results in water not discharged under design conditions, while the use of biotreatment BMPs general results in water not immediately discharged. Therefore, it would not generally be possible to mitigate HCOCs using the primary option for compliance described above while complying with LID requirements. This TGD therefore interprets this provision such that increases in Tc would be acceptable and reduction in Tc of more than 5 percent would not be acceptable. This interpretation is consistent with the overall goal of the permit to protect receiving waters from stormwater impacts to the MEP.

2-Yr / 24-Hr Storm	Runoff Volume	Time of Concentration (Tc)	Peak Flowrate
Pre-Development	15,024 CF	0.075 Hr (4.50 Minutes)	3.30 CFS
Post-Development	15,015 CF	0.129 Hr (7.74 Minutes)	3.15 CFS
Difference / %	-9 CF / -0.001%	0.054 Hr / 72%	0.15 CFS / -4.55%

The proposed project will decrease the 2-yr, 24-hr flows and will increase the time of concentration.

1.4 Conclusion

To summarize, low flows from the 1.77 acres of proposed new development will be captured in drains as it leaves the project area and conveyed to the Modular Wetlands facilities to be treated before entering the existing storm drain. The higher flows will bypass the inlets and flow in their historical drainage patterns with minimal increase or decrease to the downstream flows.

APPENDICES

APPENDIX A: EXISTING HYDROLOGY CALCULATIONS - RATIONAL METHOD (2, 25 & 100 YEAR STORM EVENTS)

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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              Ver. 15.0  Release Date: 04/01/2008  License ID 1420

                           Analysis prepared by:

                               CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


  ************************** DESCRIPTION OF STUDY **************************
 * EXISTING CONDITION                                                     *
 * 2 YR STORM                                                             *
 *                                                                        *
  ************************************************************************

   FILE NAME: 487-5EX.DAT
   TIME/DATE OF STUDY: 16:16 01/08/2025
 ============================================================================
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ============================================================================
                      --*TIME-OF-CONCENTRATION MODEL*--

   USER SPECIFIED STORM EVENT(YEAR) =    2.00
   SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
   *DATA BANK RAINFALL USED*
   *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

   *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
      HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
      WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.    (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

   GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
     1. Relative Flow-Depth =  0.00 FEET
        as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
     2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
   *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

 ************************************************************************
   FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
 ----------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ============================================================================
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   288.00
   ELEVATION DATA: UPSTREAM(FEET) =    345.00  DOWNSTREAM(FEET) =    339.80

   Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
   SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.536
```

```
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.941
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.56      0.20     0.100    57    6.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.97
  TOTAL AREA(ACRES) =      0.56   PEAK FLOW RATE(CFS) =      0.97

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    339.80
  DOWNSTREAM NODE ELEVATION(FEET) =    321.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1269.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.150
  PAVEMENT LIP(FEET) =  0.050   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   1.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.308
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        7.73      0.20     0.100    57
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      5.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.27
  AVERAGE FLOW DEPTH(FEET) =   0.33   FLOOD WIDTH(FEET) =   16.20
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   6.46   Tc(MIN.) =   13.00
  SUBAREA AREA(ACRES) =    7.73       SUBAREA RUNOFF(CFS) =    8.96
  EFFECTIVE AREA(ACRES) =    8.29     AREA-AVERAGED Fm(INCH/HR) =   0.02
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =       9.61

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOOD WIDTH(FEET) =   21.98
  FLOW VELOCITY(FEET/SEC.) =   3.50   DEPTH*VELOCITY(FT*FT/SEC) =   1.36
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1557.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        8.3  TC(MIN.) =     13.00
  EFFECTIVE AREA(ACRES) =      8.29  AREA-AVERAGED Fm(INCH/HR)=  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =       9.61
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
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                           Analysis prepared by:

                               CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* EXISTING CONDITION                                                    *
* 25 YR STORM                                                           *
*                                                                       *
 ************************************************************************

  FILE NAME: 487-5EX.DAT
  TIME/DATE OF STUDY: 16:15 01/08/2025
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====== =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   288.00
  ELEVATION DATA: UPSTREAM(FEET) =    345.00  DOWNSTREAM(FEET) =    339.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.536
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.145
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  COMMERCIAL                  D        0.56      0.20     0.100    75    6.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.08
  TOTAL AREA(ACRES) =      0.56   PEAK FLOW RATE(CFS) =      2.08

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    339.80
  DOWNSTREAM NODE ELEVATION(FEET) =    321.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1269.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.150
  PAVEMENT LIP(FEET) =  0.050   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   1.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.881
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  D        7.73      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     11.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.59
  AVERAGE FLOW DEPTH(FEET) =   0.41   FLOOD WIDTH(FEET) =   24.17
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   5.89   Tc(MIN.) =   12.43
  SUBAREA AREA(ACRES) =    7.73       SUBAREA RUNOFF(CFS) =   19.90
  EFFECTIVE AREA(ACRES) =    8.29     AREA-AVERAGED Fm(INCH/HR) =   0.02
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =      21.34

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOOD WIDTH(FEET) =   31.67
  FLOW VELOCITY(FEET/SEC.) =   3.99   DEPTH*VELOCITY(FT*FT/SEC) =   1.94
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1557.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        8.3  TC(MIN.) =     12.43
  EFFECTIVE AREA(ACRES) =      8.29  AREA-AVERAGED Fm(INCH/HR)=  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      21.34
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
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                          Analysis prepared by:

                              CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* EXISTING CONDITION                                                    *
* 100 YR STORM                                                          *
*                                                                       *
 ************************************************************************

  FILE NAME: 487-5EX.DAT
  TIME/DATE OF STUDY: 16:14 01/08/2025
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====== =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   288.00
  ELEVATION DATA: UPSTREAM(FEET) =    345.00  DOWNSTREAM(FEET) =    339.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.536
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.307
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  COMMERCIAL                  D        0.56      0.20     0.100    91    6.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.66
  TOTAL AREA(ACRES) =      0.56   PEAK FLOW RATE(CFS) =      2.66

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    339.80
  DOWNSTREAM NODE ELEVATION(FEET) =    321.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1269.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.150
  PAVEMENT LIP(FEET) =  0.050   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.721
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  D        7.73      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.77
  AVERAGE FLOW DEPTH(FEET) =   0.44   FLOOD WIDTH(FEET) =   26.98
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   5.61   Tc(MIN.) =   12.15
  SUBAREA AREA(ACRES) =    7.73       SUBAREA RUNOFF(CFS) =   25.75
  EFFECTIVE AREA(ACRES) =    8.29     AREA-AVERAGED Fm(INCH/HR) =   0.02
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =      27.61

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOOD WIDTH(FEET) =   35.27
  FLOW VELOCITY(FEET/SEC.) =   4.22   DEPTH*VELOCITY(FT*FT/SEC) =   2.20
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1557.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        8.3  TC(MIN.) =     12.15
  EFFECTIVE AREA(ACRES) =      8.29  AREA-AVERAGED Fm(INCH/HR)=  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      27.61
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX B: PROPOSED HYDROLOGY CALCULATIONS - RATIONAL METHOD (2, 25 & 100 YEAR STORM EVENTS)

```
 ************************************************************************
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              Ver. 15.0  Release Date: 04/01/2008  License ID 1420

                           Analysis prepared by:

                               CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


  ************************** DESCRIPTION OF STUDY **************************
 * PROPOSED CONDITION                                                     *
 * 2 YR STORM                                                             *
 *                                                                        *
  ************************************************************************

   FILE NAME: 487-5PR.DAT
   TIME/DATE OF STUDY: 16:21 01/08/2025
 ========================================================================
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                      --*TIME-OF-CONCENTRATION MODEL*--

   USER SPECIFIED STORM EVENT(YEAR) =    2.00
   SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
   *DATA BANK RAINFALL USED*
   *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

   *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
      HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
      WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.    (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

   GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
     1. Relative Flow-Depth =  0.00 FEET
        as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
     2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
   *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

 ************************************************************************
   FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
 ------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   288.00
   ELEVATION DATA: UPSTREAM(FEET) =    345.00  DOWNSTREAM(FEET) =    339.80

   Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
   SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.536
```

```
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.941
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.56      0.20     0.100    57    6.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.97
  TOTAL AREA(ACRES) =      0.56   PEAK FLOW RATE(CFS) =      0.97

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    339.80
  DOWNSTREAM NODE ELEVATION(FEET) =    321.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1402.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.150
  PAVEMENT LIP(FEET) =  0.050   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   1.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.252
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        7.73      0.20     0.100    57
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      5.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.12
  AVERAGE FLOW DEPTH(FEET) =   0.33   FLOOD WIDTH(FEET) =   16.36
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   7.50   Tc(MIN.) =   14.03
  SUBAREA AREA(ACRES) =    7.73       SUBAREA RUNOFF(CFS) =    8.57
  EFFECTIVE AREA(ACRES) =    8.29     AREA-AVERAGED Fm(INCH/HR) =   0.02
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =       9.19

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOOD WIDTH(FEET) =   22.14
  FLOW VELOCITY(FEET/SEC.) =   3.30   DEPTH*VELOCITY(FT*FT/SEC) =   1.29
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1690.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        8.3  TC(MIN.) =     14.03
  EFFECTIVE AREA(ACRES) =      8.29  AREA-AVERAGED Fm(INCH/HR)=  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =       9.19
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                              CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED CONDITION                                                    *
* 25 YR STORM                                                           *
*                                                                       *
 ************************************************************************

  FILE NAME: 487-5PR.DAT
  TIME/DATE OF STUDY: 16:22 01/08/2025
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====== =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   288.00
  ELEVATION DATA: UPSTREAM(FEET) =    345.00  DOWNSTREAM(FEET) =    339.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.536
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.145
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  COMMERCIAL                  D        0.56      0.20     0.100    75    6.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.08
  TOTAL AREA(ACRES) =      0.56   PEAK FLOW RATE(CFS) =      2.08

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    339.80
  DOWNSTREAM NODE ELEVATION(FEET) =    321.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1402.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.150
  PAVEMENT LIP(FEET) =  0.050   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   1.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.764
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  D        7.73      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     11.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.42
  AVERAGE FLOW DEPTH(FEET) =   0.41   FLOOD WIDTH(FEET) =   24.33
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   6.84   Tc(MIN.) =   13.38
  SUBAREA AREA(ACRES) =    7.73       SUBAREA RUNOFF(CFS) =   19.09
  EFFECTIVE AREA(ACRES) =    8.29     AREA-AVERAGED Fm(INCH/HR) =   0.02
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =      20.47

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOOD WIDTH(FEET) =   31.67
  FLOW VELOCITY(FEET/SEC.) =   3.83   DEPTH*VELOCITY(FT*FT/SEC) =   1.86
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1690.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        8.3  TC(MIN.) =     13.38
  EFFECTIVE AREA(ACRES) =      8.29  AREA-AVERAGED Fm(INCH/HR)=  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      20.47
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
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                          Analysis prepared by:

                              CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED CONDITION                                                    *
* 100 YR STORM                                                          *
*                                                                       *
 ************************************************************************

  FILE NAME: 487-5PR.DAT
  TIME/DATE OF STUDY: 16:22 01/08/2025
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====== =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   288.00
  ELEVATION DATA: UPSTREAM(FEET) =    345.00  DOWNSTREAM(FEET) =    339.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.536
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.307
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  COMMERCIAL                  D        0.56      0.20     0.100    91    6.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.66
  TOTAL AREA(ACRES) =      0.56   PEAK FLOW RATE(CFS) =      2.66

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    339.80
  DOWNSTREAM NODE ELEVATION(FEET) =    321.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1402.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.150
  PAVEMENT LIP(FEET) =  0.050   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.573
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  D        7.73      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.59
  AVERAGE FLOW DEPTH(FEET) =   0.44   FLOOD WIDTH(FEET) =   27.14
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   6.50   Tc(MIN.) =   13.04
  SUBAREA AREA(ACRES) =    7.73       SUBAREA RUNOFF(CFS) =   24.72
  EFFECTIVE AREA(ACRES) =    8.29     AREA-AVERAGED Fm(INCH/HR) =   0.02
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =      26.51

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOOD WIDTH(FEET) =   35.42
  FLOW VELOCITY(FEET/SEC.) =   4.01   DEPTH*VELOCITY(FT*FT/SEC) =   2.10
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1690.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        8.3  TC(MIN.) =     13.04
  EFFECTIVE AREA(ACRES) =      8.29  AREA-AVERAGED Fm(INCH/HR)=  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      26.51
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX C: WINTR-55 PROGRAM HYDROLOGIC ANALYSIS REPORTS

WinTR-55 Current Data Description

--- Identification Data ---

User:	487-5 WQMP	Date:	1/7/2025
Project:	Updated Brea Plaza Redevelop.	Units:	English
SubTitle:	Existing	Areal Units:	Acres
State:	California		
County:	Orange		
Filename:	S:\487-5 BREA PLAZA APARTMENTS\WQMP\WinTR-55 Existing Condition.w55		

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Total Area		Outlet	2.59	96	0.1

Total area: 2.59 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.05	.0	.0	.0	.0	.0	.0

Storm Data Source:	User-provided custom storm data
Rainfall Distribution Type:	Type I
Dimensionless Unit Hydrograph:	<standard>

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.05	.0	.0	.0	.0	.0	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: <standard>

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)
SUBAREAS	
Total Area	3.30
REACHES	
OUTLET	3.30

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)
SUBAREAS	
Total Area	3.30 9.93
REACHES	
OUTLET	3.30

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Total Area	2.59	0.100	96	Outlet	

Total Area: 2.59 (ac)

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Total Area							
SHEET	91	0.0330	0.011				0.019
SHALLOW	258	0.0039	0.025				0.056
					Time of Concentration		0.1

0.075 (rounded up to 0.1 by program)

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Total Area	Open space; grass cover > 75% (good)	D	.229	80
	Paved parking lots, roofs, driveways	D	2.361	98
	Total Area / Weighted Curve Number		2.59	96

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
Updated Brea Plaza Redevelop.
Existing

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.05 Type I 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

Updated Brea Plaza Redevelop.
Existing

Name of printed page file:
TR20.out

Existing 2-yr runoff volume = 1.598 inches x 2.59 acres x 43,560 sf/ac x 1 ft/12 inches = 15,024 cf

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
Total Area	0.004		1.598		9.93	3.30	815.42

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
4.928	0.05	0.05	0.05	0.05	0.05	0.05	0.05
4.972	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.016	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.060	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.105	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.149	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.193	0.05	0.05	0.05	0.05	0.05	0.05	0.06
5.237	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.281	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.326	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.370	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.414	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.458	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.502	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.547	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.591	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.635	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.679	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.723	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.768	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.812	0.06	0.06	0.06	0.06	0.06	0.07	0.07
5.856	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.900	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.945	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.989	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.033	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.077	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.121	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.166	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.210	0.07	0.07	0.07	0.08	0.08	0.08	0.08
6.254	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.298	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.342	0.08	0.08	0.08	0.08	0.08	0.08	0.08

6.387	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.431	0.08	0.08	0.08	0.08	0.08	0.09	0.09
6.475	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.519	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.563	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.608	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.652	0.09	0.09	0.09	0.10	0.10	0.10	0.10

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
6.696	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.740	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.785	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.829	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.873	0.11	0.11	0.11	0.11	0.11	0.11	0.11
6.917	0.11	0.11	0.11	0.11	0.11	0.11	0.11
6.961	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.006	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.050	0.11	0.11	0.11	0.11	0.12	0.12	0.12
7.094	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.138	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.182	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.227	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.271	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.315	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.359	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.403	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.448	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.492	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.536	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.580	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.625	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.669	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.713	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.757	0.13	0.13	0.13	0.13	0.14	0.14	0.14
7.801	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.846	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.890	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.934	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.978	0.14	0.14	0.14	0.14	0.14	0.14	0.14
8.022	0.14	0.14	0.14	0.14	0.14	0.14	0.15
8.067	0.15	0.15	0.15	0.15	0.15	0.15	0.15
8.111	0.15	0.15	0.15	0.15	0.15	0.15	0.16
8.155	0.16	0.16	0.16	0.16	0.16	0.16	0.16
8.199	0.16	0.16	0.17	0.17	0.17	0.17	0.17
8.243	0.17	0.17	0.17	0.17	0.18	0.18	0.18
8.288	0.18	0.18	0.18	0.18	0.18	0.18	0.18
8.332	0.19	0.19	0.19	0.19	0.19	0.19	0.19
8.376	0.20	0.20	0.20	0.20	0.20	0.20	0.20
8.420	0.20	0.20	0.20	0.21	0.21	0.21	0.21
8.465	0.21	0.21	0.21	0.22	0.22	0.22	0.22
8.509	0.22	0.22	0.22	0.22	0.22	0.22	0.23
8.553	0.23	0.23	0.23	0.23	0.23	0.23	0.23
8.597	0.24	0.24	0.24	0.24	0.24	0.24	0.24
8.641	0.24	0.24	0.25	0.25	0.25	0.25	0.25
8.686	0.25	0.25	0.25	0.25	0.26	0.26	0.26
8.730	0.26	0.26	0.26	0.26	0.26	0.27	0.27
8.774	0.27	0.27	0.27	0.27	0.27	0.27	0.27
8.818	0.27	0.28	0.28	0.28	0.28	0.28	0.28
8.862	0.28	0.29	0.29	0.29	0.29	0.29	0.29
8.907	0.29	0.29	0.29	0.29	0.30	0.30	0.30

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96 .1

STREAM REACH:

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
8.951	0.30	0.30	0.30	0.30	0.31	0.31	0.31
8.995	0.31	0.31	0.31	0.31	0.31	0.31	0.32
9.039	0.32	0.32	0.32	0.32	0.33	0.33	0.33
9.083	0.33	0.33	0.33	0.34	0.34	0.34	0.34
9.128	0.34	0.34	0.35	0.35	0.35	0.35	0.36
9.172	0.36	0.36	0.36	0.37	0.37	0.37	0.37
9.216	0.37	0.37	0.38	0.38	0.38	0.38	0.39
9.260	0.39	0.39	0.39	0.40	0.40	0.40	0.40
9.305	0.40	0.41	0.41	0.41	0.41	0.41	0.42
9.349	0.42	0.42	0.42	0.43	0.43	0.43	0.44
9.393	0.44	0.44	0.44	0.44	0.44	0.45	0.45
9.437	0.45	0.45	0.46	0.46	0.46	0.46	0.47
9.481	0.47	0.47	0.47	0.48	0.48	0.48	0.49
9.526	0.49	0.50	0.51	0.53	0.54	0.56	0.58
9.570	0.60	0.61	0.63	0.64	0.65	0.66	0.67
9.614	0.69	0.70	0.71	0.74	0.76	0.79	0.83
9.658	0.86	0.89	0.93	0.96	0.99	1.01	1.04
9.702	1.06	1.08	1.10	1.12	1.15	1.19	1.24
9.747	1.30	1.36	1.42	1.48	1.54	1.59	1.64
9.791	1.69	1.73	1.76	1.80	1.84	1.89	1.95
9.835	2.04	2.14	2.25	2.37	2.50	2.62	2.74
9.879	2.86	2.96	3.05	3.13	3.20	3.25	3.28
9.923	3.30	3.30	3.28	3.25	3.20	3.14	3.07
9.968	3.01	2.94	2.88	2.82	2.77	2.73	2.70

WinTR-20: Version 1.10
ed Brea Plaza Redevelop.
Existing

0 0 0.05 (continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

10.012	2.66	2.61	2.55	2.48	2.39	2.28	2.15
10.056	2.02	1.88	1.75	1.63	1.52	1.41	1.32
10.100	1.25	1.19	1.13	1.09	1.05	1.01	0.98
10.145	0.95	0.93	0.90	0.88	0.86	0.85	0.83
10.189	0.82	0.81	0.80	0.79	0.79	0.78	0.77
10.233	0.77	0.76	0.75	0.74	0.73	0.73	0.72
10.277	0.71	0.71	0.70	0.69	0.69	0.69	0.68
10.321	0.68	0.68	0.67	0.66	0.66	0.65	0.64
10.366	0.64	0.63	0.62	0.62	0.61	0.61	0.60
10.410	0.60	0.60	0.59	0.59	0.58	0.58	0.57
10.454	0.56	0.55	0.55	0.54	0.53	0.53	0.52
10.498	0.52	0.52	0.51	0.51	0.51	0.50	0.50
10.542	0.49	0.49	0.48	0.48	0.47	0.47	0.47
10.587	0.46	0.46	0.46	0.45	0.45	0.45	0.45
10.631	0.45	0.44	0.44	0.44	0.44	0.44	0.43
10.675	0.43	0.43	0.43	0.43	0.43	0.42	0.42
10.719	0.42	0.42	0.42	0.42	0.42	0.42	0.41
10.763	0.41	0.41	0.41	0.41	0.41	0.40	0.40
10.808	0.40	0.40	0.40	0.40	0.40	0.40	0.40
10.852	0.39	0.39	0.39	0.39	0.39	0.39	0.38
10.896	0.38	0.38	0.38	0.38	0.38	0.38	0.38
10.940	0.38	0.37	0.37	0.37	0.37	0.37	0.37
10.985	0.36	0.36	0.36	0.36	0.36	0.36	0.36
11.029	0.36	0.36	0.36	0.35	0.35	0.35	0.35
11.073	0.35	0.35	0.35	0.35	0.35	0.34	0.34
11.117	0.34	0.34	0.34	0.34	0.34	0.34	0.34
11.161	0.34	0.34	0.34	0.34	0.34	0.34	0.34

WinTR-20: Version 1.10 0 0 0.05 (continued)
ed Brea Plaza Redevelop.
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.206	0.34	0.33	0.33	0.33	0.33	0.33	0.33
11.250	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.294	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.338	0.33	0.33	0.32	0.32	0.32	0.32	0.32
11.382	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.427	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.471	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.515	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.559	0.31	0.31	0.31	0.31	0.31	0.31	0.30
11.603	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.648	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.692	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.736	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.780	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.825	0.29	0.29	0.29	0.29	0.29	0.29	0.28
11.869	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.913	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.957	0.28	0.28	0.28	0.28	0.27	0.27	0.27
12.001	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.046	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.090	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.134	0.27	0.26	0.26	0.26	0.26	0.26	0.26
12.178	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.222	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.267	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.311	0.26	0.26	0.26	0.26	0.26	0.25	0.25
12.355	0.25	0.25	0.25	0.25	0.25	0.25	0.25

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

12.399	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.443	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.488	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.532	0.25	0.25	0.25	0.24	0.24	0.24	0.24
12.576	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.620	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.665	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.709	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.753	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.797	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.841	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.886	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.930	0.23	0.23	0.23	0.23	0.22	0.22	0.22
12.974	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.018	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.062	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.107	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.151	0.22	0.21	0.21	0.21	0.21	0.21	0.21
13.195	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.239	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.283	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.328	0.21	0.21	0.21	0.21	0.20	0.20	0.20
13.372	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.416	0.20	0.20	0.20	0.20	0.20	0.20	0.20

Line
Start Time ---------- Flow Values @ time increment of 0.006 hr ----------

WinTR-20: Version 1.10 0 0 0.05 (continued)
ed Brea Plaza Redevelop.
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
13.460	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.505	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.549	0.20	0.19	0.19	0.19	0.19	0.19	0.19
13.593	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.637	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.681	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.726	0.19	0.19	0.19	0.19	0.19	0.18	0.18
13.770	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.814	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.858	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.902	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.947	0.18	0.17	0.17	0.17	0.17	0.17	0.17
13.991	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.035	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.079	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.123	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.168	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.212	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.256	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.300	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.345	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.389	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.433	0.17	0.16	0.16	0.16	0.16	0.16	0.16
14.477	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.521	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.566	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.610	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.654	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.698	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.742	0.16	0.16	0.16	0.16	0.16	0.16	0.16

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. Existing (continued)

STORM 2-Yr

SUB-AREA:
Total Area Outlet .00405 96. .1

STREAM REACH:

14.787	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.831	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.875	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.919	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.963	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.008	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.052	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.096	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.140	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.185	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.229	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.273	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.317	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.361	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.406	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.450	0.16	0.16	0.15	0.15	0.15	0.15	0.15
15.494	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.538	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.582	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.627	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.671	0.15	0.15	0.15	0.15	0.15	0.15	0.15

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
15.715	0.15	0.15	0.15	0.15	0.15	0.15	0.15

WinTR-20: Version 1.10 0 0 0.05 (continued)
ed Brea Plaza Redevelop.
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

15.759	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.803	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.848	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.892	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.936	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.980	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.025	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.069	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.113	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.157	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.201	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.246	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.290	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.334	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.378	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.422	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.467	0.15	0.14	0.14	0.14	0.14	0.14	0.14
16.511	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.555	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.599	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.643	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.688	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.732	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.776	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.820	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.865	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.909	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.953	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.997	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.041	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.086	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.130	0.14	0.14	0.14	0.14	0.14	0.14	0.14

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

17.174	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.218	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.262	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.307	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.351	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.395	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.439	0.14	0.14	0.14	0.14	0.14	0.13	0.13
17.483	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.528	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.572	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.616	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.660	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.705	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.749	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.793	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.837	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.881	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.926	0.13	0.13	0.13	0.13	0.13	0.13	0.13

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
17.970	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.014	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.058	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.102	0.13	0.13	0.13	0.13	0.13	0.13	0.13

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

18.147	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.191	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.235	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.279	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.323	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.368	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.412	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.456	0.13	0.13	0.12	0.12	0.12	0.12	0.12
18.500	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.545	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.589	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.633	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.677	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.721	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.766	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.810	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.854	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.898	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.942	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.987	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.031	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.075	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.119	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.163	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.208	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.252	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.296	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.340	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.385	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.429	0.12	0.12	0.12	0.12	0.12	0.11	0.11
19.473	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.517	0.11	0.11	0.11	0.11	0.11	0.11	0.11

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. Existing (continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

19.561	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.606	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.650	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.694	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.738	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.782	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.827	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.871	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.915	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.959	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.003	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.048	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.092	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.136	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.180	0.11	0.11	0.11	0.11	0.11	0.11	0.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
20.225	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.269	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.313	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.357	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.401	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.446	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.490	0.10	0.10	0.10	0.10	0.10	0.10	0.10

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

20.534	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.578	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.622	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.667	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.711	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.755	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.799	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.843	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.888	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.932	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.976	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.020	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.065	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.109	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.153	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.197	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.241	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.286	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.330	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.374	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.418	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.462	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.507	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.551	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.595	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.639	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.683	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.728	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.772	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.816	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.860	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.905	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10
ed Brea Plaza Redevelop.
Existing

0 0 0.05 (continued)

STORM 2-Yr

SUB-AREA:
Total Area Outlet .00405 96. .1

STREAM REACH:

21.949	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.993	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.037	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.081	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.126	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.170	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.214	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.258	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.302	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.347	0.09	0.09	0.09	0.09	0.09	0.09	0.08
22.391	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.435	0.08	0.08	0.08	0.08	0.08	0.08	0.08

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
22.479	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.523	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.568	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.612	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.656	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.700	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.745	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.789	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.833	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.877	0.08	0.08	0.08	0.08	0.08	0.08	0.08

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop.
Existing
(continued)

ST●RM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

22.921	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.966	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.010	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.054	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.098	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.142	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.187	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.231	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.275	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.319	0.08	0.08	0.08	0.08	0.08	0.08	0.07
23.363	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.408	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.452	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.496	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.540	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.585	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.629	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.673	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.717	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.761	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.806	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.850	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.894	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.938	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.982	0.07	0.07	0.07	0.07	0.07	0.07	0.07
24.027	0.06	0.06	0.06	0.05			

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
OUTLET	0.004		1.598		9.93	3.30	815.42

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
4.928	0.05	0.05	0.05	0.05	0.05	0.05	0.05
4.972	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.016	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.060	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
5.105	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.149	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.193	0.05	0.05	0.05	0.05	0.05	0.05	0.06
5.237	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.281	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.326	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.370	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.414	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.458	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.502	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.547	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.591	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.635	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

5.679	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.723	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.768	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.812	0.06	0.06	0.06	0.06	0.06	0.07	0.07
5.856	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.900	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.945	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.989	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.033	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.077	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.121	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.166	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.210	0.07	0.07	0.07	0.08	0.08	0.08	0.08
6.254	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.298	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.342	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.387	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.431	0.08	0.08	0.08	0.08	0.08	0.09	0.09
6.475	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.519	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.563	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.608	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.652	0.09	0.09	0.09	0.10	0.10	0.10	0.10
6.696	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.740	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.785	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.829	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.873	0.11	0.11	0.11	0.11	0.11	0.11	0.11
6.917	0.11	0.11	0.11	0.11	0.11	0.11	0.11
6.961	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.006	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.050	0.11	0.11	0.11	0.11	0.12	0.12	0.12

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

7.094	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.138	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.182	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.227	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.271	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.315	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
7.359	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.403	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.448	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.492	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.536	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.580	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.625	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.669	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.713	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.757	0.13	0.13	0.13	0.13	0.14	0.14	0.14
7.801	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.846	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.890	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.934	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.978	0.14	0.14	0.14	0.14	0.14	0.14	0.14
8.022	0.14	0.14	0.14	0.14	0.14	0.14	0.15

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

8.067	0.15	0.15	0.15	0.15	0.15	0.15	0.15
8.111	0.15	0.15	0.15	0.15	0.15	0.15	0.16
8.155	0.16	0.16	0.16	0.16	0.16	0.16	0.16
8.199	0.16	0.16	0.17	0.17	0.17	0.17	0.17
8.243	0.17	0.17	0.17	0.17	0.18	0.18	0.18
8.288	0.18	0.18	0.18	0.18	0.18	0.18	0.18
8.332	0.19	0.19	0.19	0.19	0.19	0.19	0.19
8.376	0.20	0.20	0.20	0.20	0.20	0.20	0.20
8.420	0.20	0.20	0.20	0.21	0.21	0.21	0.21
8.465	0.21	0.21	0.21	0.22	0.22	0.22	0.22
8.509	0.22	0.22	0.22	0.22	0.22	0.22	0.23
8.553	0.23	0.23	0.23	0.23	0.23	0.23	0.23
8.597	0.24	0.24	0.24	0.24	0.24	0.24	0.24
8.641	0.24	0.24	0.25	0.25	0.25	0.25	0.25
8.686	0.25	0.25	0.25	0.25	0.26	0.26	0.26
8.730	0.26	0.26	0.26	0.26	0.26	0.27	0.27
8.774	0.27	0.27	0.27	0.27	0.27	0.27	0.27
8.818	0.27	0.28	0.28	0.28	0.28	0.28	0.28
8.862	0.28	0.29	0.29	0.29	0.29	0.29	0.29
8.907	0.29	0.29	0.29	0.29	0.30	0.30	0.30
8.951	0.30	0.30	0.30	0.30	0.31	0.31	0.31
8.995	0.31	0.31	0.31	0.31	0.31	0.31	0.32
9.039	0.32	0.32	0.32	0.32	0.33	0.33	0.33
9.083	0.33	0.33	0.33	0.34	0.34	0.34	0.34
9.128	0.34	0.34	0.35	0.35	0.35	0.35	0.36
9.172	0.36	0.36	0.36	0.37	0.37	0.37	0.37
9.216	0.37	0.37	0.38	0.38	0.38	0.38	0.39
9.260	0.39	0.39	0.39	0.40	0.40	0.40	0.40
9.305	0.40	0.41	0.41	0.41	0.41	0.41	0.42
9.349	0.42	0.42	0.42	0.43	0.43	0.43	0.44
9.393	0.44	0.44	0.44	0.44	0.44	0.45	0.45
9.437	0.45	0.45	0.46	0.46	0.46	0.46	0.47

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

9.481	0.47	0.47	0.47	0.48	0.48	0.48	0.49
9.526	0.49	0.50	0.51	0.53	0.54	0.56	0.58
9.570	0.60	0.61	0.63	0.64	0.65	0.66	0.67

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
9.614	0.69	0.70	0.71	0.74	0.76	0.79	0.83
9.658	0.86	0.89	0.93	0.96	0.99	1.01	1.04
9.702	1.06	1.08	1.10	1.12	1.15	1.19	1.24
9.747	1.30	1.36	1.42	1.48	1.54	1.59	1.64
9.791	1.69	1.73	1.76	1.80	1.84	1.89	1.95
9.835	2.04	2.14	2.25	2.37	2.50	2.62	2.74
9.879	2.86	2.96	3.05	3.13	3.20	3.25	3.28
9.923	3.30	3.30	3.28	3.25	3.20	3.14	3.07
9.968	3.01	2.94	2.88	2.82	2.77	2.73	2.70
10.012	2.66	2.61	2.55	2.48	2.39	2.28	2.15
10.056	2.02	1.88	1.75	1.63	1.52	1.41	1.32
10.100	1.25	1.19	1.13	1.09	1.05	1.01	0.98
10.145	0.95	0.93	0.90	0.88	0.86	0.85	0.83
10.189	0.82	0.81	0.80	0.79	0.79	0.78	0.77
10.233	0.77	0.76	0.75	0.74	0.73	0.73	0.72
10.277	0.71	0.71	0.70	0.69	0.69	0.69	0.68
10.321	0.68	0.68	0.67	0.66	0.66	0.65	0.64
10.366	0.64	0.63	0.62	0.62	0.61	0.61	0.60
10.410	0.60	0.60	0.59	0.59	0.58	0.58	0.57

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

10.454	0.56	0.55	0.55	0.54	0.53	0.53	0.52
10.498	0.52	0.52	0.51	0.51	0.51	0.50	0.50
10.542	0.49	0.49	0.48	0.48	0.47	0.47	0.47
10.587	0.46	0.46	0.46	0.45	0.45	0.45	0.45
10.631	0.45	0.44	0.44	0.44	0.44	0.44	0.43
10.675	0.43	0.43	0.43	0.43	0.43	0.42	0.42
10.719	0.42	0.42	0.42	0.42	0.42	0.42	0.41
10.763	0.41	0.41	0.41	0.41	0.41	0.40	0.40
10.808	0.40	0.40	0.40	0.40	0.40	0.40	0.40
10.852	0.39	0.39	0.39	0.39	0.39	0.39	0.38
10.896	0.38	0.38	0.38	0.38	0.38	0.38	0.38
10.940	0.38	0.37	0.37	0.37	0.37	0.37	0.37
10.985	0.36	0.36	0.36	0.36	0.36	0.36	0.36
11.029	0.36	0.36	0.36	0.35	0.35	0.35	0.35
11.073	0.35	0.35	0.35	0.35	0.35	0.34	0.34
11.117	0.34	0.34	0.34	0.34	0.34	0.34	0.34
11.161	0.34	0.34	0.34	0.34	0.34	0.34	0.34
11.206	0.34	0.33	0.33	0.33	0.33	0.33	0.33
11.250	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.294	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.338	0.33	0.33	0.32	0.32	0.32	0.32	0.32
11.382	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.427	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.471	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.515	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.559	0.31	0.31	0.31	0.31	0.31	0.31	0.30
11.603	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.648	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.692	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.736	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.780	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.825	0.29	0.29	0.29	0.29	0.29	0.29	0.28

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.869	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.913	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.957	0.28	0.28	0.28	0.28	0.27	0.27	0.27
12.001	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.046	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.090	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.134	0.27	0.26	0.26	0.26	0.26	0.26	0.26
12.178	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.222	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.267	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.311	0.26	0.26	0.26	0.26	0.26	0.25	0.25
12.355	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.399	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.443	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.488	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.532	0.25	0.25	0.25	0.24	0.24	0.24	0.24
12.576	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.620	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.665	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.709	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.753	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.797	0.23	0.23	0.23	0.23	0.23	0.23	0.23

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

12.841	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.886	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.930	0.23	0.23	0.23	0.23	0.22	0.22	0.22
12.974	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.018	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.062	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.107	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.151	0.22	0.21	0.21	0.21	0.21	0.21	0.21
13.195	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.239	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.283	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.328	0.21	0.21	0.21	0.21	0.20	0.20	0.20
13.372	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.416	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.460	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.505	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.549	0.20	0.19	0.19	0.19	0.19	0.19	0.19
13.593	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.637	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.681	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.726	0.19	0.19	0.19	0.19	0.19	0.18	0.18
13.770	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.814	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.858	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.902	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.947	0.18	0.17	0.17	0.17	0.17	0.17	0.17
13.991	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.035	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.079	0.17	0.17	0.17	0.17	0.17	0.17	0.17

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:
Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
14.123	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.168	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.212	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.256	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.300	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.345	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.389	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.433	0.17	0.16	0.16	0.16	0.16	0.16	0.16
14.477	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.521	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.566	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.610	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.654	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.698	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.742	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.787	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.831	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.875	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.919	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.963	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.008	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.052	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.096	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.140	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.185	0.16	0.16	0.16	0.16	0.16	0.16	0.16

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop.
Existing
(continued)

STORM 2-Yr

SUB-AREA:
'Total AreaOutlet .00405 96. .1

STREAM REACH:

15.229	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.273	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.317	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.361	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.406	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.450	0.16	0.16	0.15	0.15	0.15	0.15	0.15
15.494	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.538	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.582	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.627	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.671	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.715	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.759	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.803	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.848	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.892	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.936	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.980	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.025	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.069	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.113	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.157	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.201	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.246	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.290	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.334	0.15	0.15	0.15	0.15	0.15	0.15	0.15

Updated Brea Plaza Redevelop.
Existing

WinTR-20: Version 1.10 0 0 0.05 (continued)
ed Brea Plaza Redevelop.
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:
Line
Start Time ---------- Flow Values @ time increment of 0.006 hr ----------
(hr) (cfs) (cfs) (cfs) (cfs) (cfs) (cfs) (cfs)

16.378	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.422	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.467	0.15	0.14	0.14	0.14	0.14	0.14	0.14
16.511	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.555	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.599	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.643	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.688	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.732	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.776	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.820	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.865	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.909	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.953	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.997	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.041	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.086	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.130	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.174	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.218	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.262	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.307	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.351	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.395	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.439	0.14	0.14	0.14	0.14	0.14	0.13	0.13
17.483	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.528	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.572	0.13	0.13	0.13	0.13	0.13	0.13	0.13

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

17.616	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.660	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.705	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.749	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.793	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.837	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.881	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.926	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.970	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.014	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.058	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.102	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.147	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.191	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.235	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.279	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.323	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.368	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.412	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.456	0.13	0.13	0.12	0.12	0.12	0.12	0.12
18.500	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.545	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.589	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

18.633	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.677	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.721	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.766	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.810	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.854	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.898	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.942	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.987	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.031	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.075	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.119	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.163	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.208	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.252	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.296	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.340	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.385	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.429	0.12	0.12	0.12	0.12	0.12	0.11	0.11
19.473	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.517	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.561	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.606	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.650	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.694	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.738	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.782	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.827	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.871	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.915	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.959	0.11	0.11	0.11	0.11	0.11	0.11	0.11

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

20.003	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.048	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.092	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.136	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.180	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.225	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.269	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.313	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.357	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.401	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.446	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.490	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.534	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.578	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.622	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.667	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.711	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.755	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.799	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.843	0.10	0.10	0.10	0.10	0.10	0.10	0.10

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
20.888	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.932	0.10	0.10	0.10	0.10	0.10	0.10	0.10

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

20.976	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.020	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.065	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.109	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.153	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.197	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.241	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.286	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.330	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.374	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.418	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.462	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.507	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.551	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.595	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.639	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.683	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.728	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.772	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.816	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.860	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.905	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.949	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.993	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.037	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.081	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.126	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.170	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.214	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.258	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.302	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.347	0.09	0.09	0.09	0.09	0.09	0.09	0.08

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

22.391	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.435	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.479	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.523	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.568	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.612	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.656	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.700	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.745	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.789	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.833	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.877	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.921	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.966	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.010	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.054	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.098	0.08	0.08	0.08	0.08	0.08	0.08	0.08

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
23.142	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.187	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.231	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.275	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.319	0.08	0.08	0.08	0.08	0.08	0.08	0.07

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

23.363	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.408	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.452	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.496	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.540	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.585	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.629	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.673	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.717	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.761	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.806	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.850	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.894	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.938	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.982	0.07	0.07	0.07	0.07	0.07	0.07	0.07
24.027	0.06	0.06	0.06	0.05			

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

Updated Brea Plaza Redevelop.
Existing

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
Total Area	0.004		3.30				
OUTLET	0.004		3.30				

WinTR-20: Version 1.10 0 0 0.05 (continued)
ed Brea Plaza Redevelop.
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

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WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

WinTR-55 Current Data Description

--- Identification Data ---

User:	487-5 WQMP	Date:	1/7/2025
Project:	Updated Brea Plaza Redevelop.	Units:	English
SubTitle:	Proposed	Areal Units:	Acres
State:	California		
County:	Orange		
Filename:	S:\487-5 BREA PLAZA APARTMENTS\WQMP\WinTR-55 Proposed Condition.w55		

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Total Area		Outlet	2.59	96	.129

Total area: 2.59 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.05	.0	.0	.0	.0	.0	.0

Storm Data Source:	User-provided custom storm data
Rainfall Distribution Type:	Type I
Dimensionless Unit Hydrograph:	<standard>

Updated Brea Plaza Redevelop.
Proposed
Orange County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.05	.0	.0	.0	.0	.0	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: <standard>

Updated Brea Plaza Redevelop.
Proposed
Orange County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)
SUBAREAS	
Total Area	3.15
REACHES	
OUTLET	3.15

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Proposed
Orange County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)
SUBAREAS	
Total Area	3.15 9.95
REACHES	
OUTLET	3.15

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Proposed
Orange County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Total Area	2.59	0.129	96	Outlet	

Total Area: 2.59 (ac)

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Proposed
Orange County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Total Area							
SHEET	58	0.0200	0.011				0.016
SHALLOW	253	0.0070	0.025				0.041
CHANNEL	407	0.0050	0.013	0.09	1.05	1.570	0.072
					Time of Concentration		.129

Updated Brea Plaza Redevelop.
Proposed
Orange County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Total Area	Open space; grass cover > 75% (good)	D	.324	80
	Paved parking lots, roofs, driveways	D	2.266	98
	Total Area / Weighted Curve Number		2.59	96

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

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Updated Brea Plaza Redevelop.
Proposed

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.05 Type I 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

Updated Brea Plaza Redevelop.
Proposed

Name of printed page file:
TR20.out

Proposed 2-yr runoff volume =
1.597 inches x 2.59 acres x 43,560 sf/ac x
1 ft/12 inches = 15,015 cf

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
Total Area	0.004		1.597		9.95	3.15	777.54

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
4.953	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.010	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.067	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.124	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.181	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.238	0.05	0.05	0.06	0.06	0.06	0.06	0.06
5.295	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.352	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.409	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.466	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.523	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.580	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.637	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.694	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.751	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.808	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.865	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.922	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.979	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.036	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.093	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.150	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.207	0.07	0.07	0.07	0.07	0.07	0.07	0.08
6.264	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.321	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.378	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.435	0.08	0.08	0.08	0.08	0.08	0.08	0.09
6.493	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.550	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.607	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.664	0.09	0.09	0.09	0.10	0.10	0.10	0.10
6.721	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.778	0.10	0.10	0.10	0.10	0.10	0.10	0.10

6.835	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.892	0.10	0.11	0.11	0.11	0.11	0.11	0.11
6.949	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.006	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.063	0.11	0.11	0.11	0.11	0.11	0.12	0.12
7.120	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.177	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
7.234	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.291	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.348	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.405	0.12	0.12	0.12	0.13	0.13	0.13	0.13
7.462	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.519	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.576	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.633	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.690	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.747	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.804	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.861	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.918	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.975	0.14	0.14	0.14	0.14	0.14	0.14	0.14
8.032	0.14	0.14	0.14	0.14	0.14	0.14	0.15
8.089	0.15	0.15	0.15	0.15	0.15	0.15	0.15
8.146	0.15	0.15	0.15	0.16	0.16	0.16	0.16
8.203	0.16	0.16	0.16	0.16	0.17	0.17	0.17
8.261	0.17	0.17	0.17	0.17	0.18	0.18	0.18
8.318	0.18	0.18	0.18	0.18	0.19	0.19	0.19
8.375	0.19	0.19	0.19	0.20	0.20	0.20	0.20
8.432	0.20	0.20	0.20	0.20	0.21	0.21	0.21
8.489	0.21	0.21	0.21	0.22	0.22	0.22	0.22
8.546	0.22	0.22	0.22	0.23	0.23	0.23	0.23
8.603	0.23	0.23	0.23	0.24	0.24	0.24	0.24
8.660	0.24	0.24	0.25	0.25	0.25	0.25	0.25
8.717	0.25	0.25	0.26	0.26	0.26	0.26	0.26
8.774	0.26	0.26	0.27	0.27	0.27	0.27	0.27
8.831	0.27	0.27	0.28	0.28	0.28	0.28	0.28
8.888	0.28	0.29	0.29	0.29	0.29	0.29	0.29
8.945	0.29	0.30	0.30	0.30	0.30	0.30	0.30
9.002	0.31	0.31	0.31	0.31	0.31	0.31	0.32
9.059	0.32	0.32	0.32	0.33	0.33	0.33	0.33
9.116	0.33	0.34	0.34	0.34	0.34	0.34	0.35
9.173	0.35	0.35	0.36	0.36	0.36	0.36	0.37
9.230	0.37	0.37	0.37	0.38	0.38	0.38	0.39
9.287	0.39	0.39	0.40	0.40	0.40	0.40	0.41
9.344	0.41	0.41	0.42	0.42	0.42	0.43	0.43
9.401	0.43	0.43	0.44	0.44	0.44	0.44	0.45
9.458	0.45	0.45	0.46	0.46	0.46	0.47	0.47
9.515	0.47	0.48	0.49	0.50	0.51	0.52	0.54
9.572	0.56	0.58	0.59	0.61	0.63	0.64	0.66
9.629	0.68	0.70	0.73	0.76	0.79	0.83	0.86
9.686	0.90	0.93	0.97	1.00	1.03	1.07	1.10
9.743	1.15	1.20	1.26	1.33	1.39	1.46	1.52
9.800	1.58	1.64	1.70	1.76	1.83	1.92	2.02
9.857	2.14	2.27	2.40	2.53	2.66	2.78	2.89
9.914	2.99	3.07	3.12	3.15	3.15	3.13	3.10
9.971	3.05	3.00	2.94	2.89	2.83	2.78	2.71
10.028	2.65	2.57	2.48	2.36	2.24	2.10	1.96
10.086	1.83	1.70	1.58	1.47	1.37	1.28	1.21

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
10.143	1.15	1.10	1.06	1.01	0.98	0.95	0.92
10.200	0.89	0.87	0.85	0.84	0.82	0.81	0.79
10.257	0.78	0.77	0.76	0.75	0.73	0.73	0.72
10.314	0.71	0.70	0.69	0.69	0.68	0.67	0.66
10.371	0.65	0.65	0.64	0.63	0.62	0.62	0.61
10.428	0.60	0.60	0.59	0.58	0.58	0.57	0.56
10.485	0.55	0.54	0.54	0.53	0.53	0.52	0.51
10.542	0.51	0.50	0.50	0.49	0.49	0.48	0.48
10.599	0.47	0.47	0.46	0.46	0.46	0.45	0.45
10.656	0.45	0.44	0.44	0.44	0.44	0.43	0.43
10.713	0.43	0.43	0.43	0.42	0.42	0.42	0.42
10.770	0.42	0.41	0.41	0.41	0.41	0.41	0.41
10.827	0.40	0.40	0.40	0.40	0.40	0.40	0.39
10.884	0.39	0.39	0.39	0.39	0.38	0.38	0.38
10.941	0.38	0.38	0.38	0.37	0.37	0.37	0.37
10.998	0.37	0.36	0.36	0.36	0.36	0.36	0.36
11.055	0.36	0.36	0.35	0.35	0.35	0.35	0.35
11.112	0.35	0.35	0.35	0.34	0.34	0.34	0.34
11.169	0.34	0.34	0.34	0.34	0.34	0.34	0.34
11.226	0.34	0.34	0.33	0.33	0.33	0.33	0.33
11.283	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.340	0.33	0.33	0.33	0.32	0.32	0.32	0.32
11.397	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.454	0.32	0.32	0.32	0.32	0.32	0.31	0.31

WinTR-20: Version 1.10
ed Brea Plaza Redevelop.
Proposed

0 0 0.05 (continued)

STORM 2-Yr

SUB-AREA:
Total Area Outlet .00405 96. .129

STREAM REACH:

11.511	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.568	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.625	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.682	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.739	0.30	0.30	0.29	0.29	0.29	0.29	0.29
11.796	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.853	0.29	0.29	0.29	0.29	0.28	0.28	0.28
11.911	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.968	0.28	0.28	0.28	0.28	0.28	0.27	0.27
12.025	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.082	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.139	0.27	0.27	0.27	0.26	0.26	0.26	0.26
12.196	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.253	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.310	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.367	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.424	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.481	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.538	0.25	0.25	0.25	0.25	0.24	0.24	0.24
12.595	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.652	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.709	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.766	0.24	0.23	0.23	0.23	0.23	0.23	0.23
12.823	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.880	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.937	0.23	0.23	0.23	0.23	0.23	0.22	0.22
12.994	0.22	0.22	0.22	0.22	0.22	0.22	0.22

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ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)						
13.051	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.108	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.165	0.22	0.21	0.21	0.21	0.21	0.21	0.21
13.222	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.279	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.336	0.21	0.21	0.21	0.21	0.21	0.20	0.20
13.393	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.450	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.507	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.564	0.20	0.19	0.19	0.19	0.19	0.19	0.19
13.621	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.679	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.736	0.19	0.19	0.19	0.19	0.19	0.18	0.18
13.793	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.850	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.907	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.964	0.18	0.17	0.17	0.17	0.17	0.17	0.17
14.021	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.078	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.135	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.192	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.249	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.306	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.363	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.420	0.17	0.17	0.17	0.17	0.17	0.16	0.16
14.477	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.534	0.16	0.16	0.16	0.16	0.16	0.16	0.16

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

14.591	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.648	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.705	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.762	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.819	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.876	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.933	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.990	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.047	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.104	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.161	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.218	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.275	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.332	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.389	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.446	0.16	0.16	0.16	0.16	0.16	0.15	0.15
15.504	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.561	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.618	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.675	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.732	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.789	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.846	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.903	0.15	0.15	0.15	0.15	0.15	0.15	0.15

Line
Start Time ---------- Flow Values @ time increment of 0.008 hr ----------

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
15.960	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.017	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.074	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.131	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.188	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.245	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.302	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.359	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.416	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.473	0.15	0.15	0.15	0.14	0.14	0.14	0.14
16.530	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.587	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.644	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.701	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.758	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.815	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.872	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.929	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.986	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.043	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.100	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.157	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.214	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.271	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.329	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.386	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.443	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.500	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.557	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.614	0.13	0.13	0.13	0.13	0.13	0.13	0.13

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. Proposed (continued)

STORM 2-Yr

SUB-AREA:
Total Area Outlet .00405 96. .129

STREAM REACH:

17.671	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.728	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.785	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.842	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.899	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.956	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.013	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.070	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.127	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.184	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.241	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.298	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.355	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.412	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.469	0.13	0.13	0.13	0.12	0.12	0.12	0.12
18.526	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.583	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.640	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.697	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.754	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.811	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
18.868	0.12	0.12	0.12	0.12	0.12	0.12	0.12

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

18.925	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.982	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.039	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.097	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.154	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.211	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.268	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.325	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.382	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.439	0.12	0.12	0.12	0.12	0.12	0.11	0.11
19.496	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.553	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.610	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.667	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.724	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.781	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.838	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.895	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.952	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.009	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.066	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.123	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.180	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.237	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.294	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.351	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.408	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.465	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.522	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.579	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.636	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.693	0.10	0.10	0.10	0.10	0.10	0.10	0.10

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. Proposed (continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

20.750	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.807	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.864	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.922	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.979	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.036	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.093	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.150	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.207	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.264	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.321	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.378	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.435	0.10	0.09	0.09	0.09	0.09	0.09	0.09
21.492	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.549	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.606	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.663	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.720	0.09	0.09	0.09	0.09	0.09	0.09	0.09

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)						
21.777	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.834	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.891	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.948	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

22.005	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.062	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.119	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.176	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.233	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.290	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.347	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.404	0.09	0.08	0.08	0.08	0.08	0.08	0.08
22.461	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.518	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.575	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.632	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.689	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.747	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.804	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.861	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.918	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.975	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.032	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.089	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.146	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.203	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.260	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.317	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.374	0.08	0.07	0.07	0.07	0.07	0.07	0.07
23.431	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.488	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.545	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.602	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.659	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.716	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.773	0.07	0.07	0.07	0.07	0.07	0.07	0.07

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

23.830	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.887	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.944	0.07	0.07	0.07	0.07	0.07	0.07	0.07
24.001	0.07	0.07	0.07	0.07	0.06	0.06	0.06
24.058	0.05						

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
OUTLET	0.004		1.597		9.95	3.15	777.54

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
4.953	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.010	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.067	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.124	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.181	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.238	0.05	0.05	0.06	0.06	0.06	0.06	0.06
5.295	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

5.352	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.409	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.466	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.523	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.580	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.637	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.694	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.751	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.808	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.865	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.922	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.979	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.036	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.093	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.150	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.207	0.07	0.07	0.07	0.07	0.07	0.07	0.08
6.264	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.321	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.378	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.435	0.08	0.08	0.08	0.08	0.08	0.08	0.09
6.493	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.550	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.607	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.664	0.09	0.09	0.09	0.10	0.10	0.10	0.10
6.721	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.778	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.835	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.892	0.10	0.11	0.11	0.11	0.11	0.11	0.11
6.949	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.006	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.063	0.11	0.11	0.11	0.11	0.11	0.12	0.12
7.120	0.12	0.12	0.12	0.12	0.12	0.12	0.12

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 ed Brea Plaza Redevelop. Proposed 0 0 0.05 (continued)

STORM 2-Yr

SUB-AREA:

	Total Area	Outlet					
			.00405	96.	.129		

STREAM REACH:

7.177	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.234	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.291	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.348	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.405	0.12	0.12	0.12	0.13	0.13	0.13	0.13
7.462	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.519	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.576	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.633	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.690	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.747	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.804	0.14	0.14	0.14	0.14	0.14	0.14	0.14

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
7.861	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.918	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.975	0.14	0.14	0.14	0.14	0.14	0.14	0.14
8.032	0.14	0.14	0.14	0.14	0.14	0.14	0.15
8.089	0.15	0.15	0.15	0.15	0.15	0.15	0.15
8.146	0.15	0.15	0.15	0.16	0.16	0.16	0.16
8.203	0.16	0.16	0.16	0.16	0.17	0.17	0.17
8.261	0.17	0.17	0.17	0.17	0.18	0.18	0.18
8.318	0.18	0.18	0.18	0.18	0.19	0.19	0.19
8.375	0.19	0.19	0.19	0.20	0.20	0.20	0.20

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

8.432	0.20	0.20	0.20	0.20	0.21	0.21	0.21
8.489	0.21	0.21	0.21	0.22	0.22	0.22	0.22
8.546	0.22	0.22	0.22	0.23	0.23	0.23	0.23
8.603	0.23	0.23	0.23	0.24	0.24	0.24	0.24
8.660	0.24	0.24	0.25	0.25	0.25	0.25	0.25
8.717	0.25	0.25	0.26	0.26	0.26	0.26	0.26
8.774	0.26	0.26	0.27	0.27	0.27	0.27	0.27
8.831	0.27	0.27	0.28	0.28	0.28	0.28	0.28
8.888	0.28	0.29	0.29	0.29	0.29	0.29	0.29
8.945	0.29	0.30	0.30	0.30	0.30	0.30	0.30
9.002	0.31	0.31	0.31	0.31	0.31	0.31	0.32
9.059	0.32	0.32	0.32	0.33	0.33	0.33	0.33
9.116	0.33	0.34	0.34	0.34	0.34	0.34	0.35
9.173	0.35	0.35	0.36	0.36	0.36	0.36	0.37
9.230	0.37	0.37	0.37	0.38	0.38	0.38	0.39
9.287	0.39	0.39	0.40	0.40	0.40	0.40	0.41
9.344	0.41	0.41	0.42	0.42	0.42	0.43	0.43
9.401	0.43	0.43	0.44	0.44	0.44	0.44	0.45
9.458	0.45	0.45	0.46	0.46	0.46	0.47	0.47
9.515	0.47	0.48	0.49	0.50	0.51	0.52	0.54
9.572	0.56	0.58	0.59	0.61	0.63	0.64	0.66
9.629	0.68	0.70	0.73	0.76	0.79	0.83	0.86
9.686	0.90	0.93	0.97	1.00	1.03	1.07	1.10
9.743	1.15	1.20	1.26	1.33	1.39	1.46	1.52
9.800	1.58	1.64	1.70	1.76	1.83	1.92	2.02
9.857	2.14	2.27	2.40	2.53	2.66	2.78	2.89
9.914	2.99	3.07	3.12	3.15	3.15	3.13	3.10
9.971	3.05	3.00	2.94	2.89	2.83	2.78	2.71
10.028	2.65	2.57	2.48	2.36	2.24	2.10	1.96
10.086	1.83	1.70	1.58	1.47	1.37	1.28	1.21
10.143	1.15	1.10	1.06	1.01	0.98	0.95	0.92
10.200	0.89	0.87	0.85	0.84	0.82	0.81	0.79

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

10.257	0.78	0.77	0.76	0.75	0.73	0.73	0.72
10.314	0.71	0.70	0.69	0.69	0.68	0.67	0.66
10.371	0.65	0.65	0.64	0.63	0.62	0.62	0.61
10.428	0.60	0.60	0.59	0.58	0.58	0.57	0.56
10.485	0.55	0.54	0.54	0.53	0.53	0.52	0.51
10.542	0.51	0.50	0.50	0.49	0.49	0.48	0.48
10.599	0.47	0.47	0.46	0.46	0.46	0.45	0.45
10.656	0.45	0.44	0.44	0.44	0.44	0.43	0.43
10.713	0.43	0.43	0.43	0.42	0.42	0.42	0.42

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
10.770	0.42	0.41	0.41	0.41	0.41	0.41	0.41
10.827	0.40	0.40	0.40	0.40	0.40	0.40	0.39
10.884	0.39	0.39	0.39	0.39	0.38	0.38	0.38
10.941	0.38	0.38	0.38	0.37	0.37	0.37	0.37
10.998	0.37	0.36	0.36	0.36	0.36	0.36	0.36
11.055	0.36	0.36	0.35	0.35	0.35	0.35	0.35
11.112	0.35	0.35	0.35	0.34	0.34	0.34	0.34
11.169	0.34	0.34	0.34	0.34	0.34	0.34	0.34
11.226	0.34	0.34	0.33	0.33	0.33	0.33	0.33
11.283	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.340	0.33	0.33	0.33	0.32	0.32	0.32	0.32
11.397	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.454	0.32	0.32	0.32	0.32	0.32	0.31	0.31

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

11.511	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.568	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.625	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.682	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.739	0.30	0.30	0.29	0.29	0.29	0.29	0.29
11.796	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.853	0.29	0.29	0.29	0.29	0.28	0.28	0.28
11.911	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.968	0.28	0.28	0.28	0.28	0.28	0.27	0.27
12.025	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.082	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.139	0.27	0.27	0.27	0.26	0.26	0.26	0.26
12.196	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.253	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.310	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.367	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.424	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.481	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.538	0.25	0.25	0.25	0.25	0.24	0.24	0.24
12.595	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.652	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.709	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.766	0.24	0.23	0.23	0.23	0.23	0.23	0.23
12.823	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.880	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.937	0.23	0.23	0.23	0.23	0.23	0.22	0.22
12.994	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.051	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.108	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.165	0.22	0.21	0.21	0.21	0.21	0.21	0.21
13.222	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.279	0.21	0.21	0.21	0.21	0.21	0.21	0.21

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

13.336	0.21	0.21	0.21	0.21	0.21	0.20	0.20
13.393	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.450	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.507	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.564	0.20	0.19	0.19	0.19	0.19	0.19	0.19
13.621	0.19	0.19	0.19	0.19	0.19	0.19	0.19

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)						
13.679	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.736	0.19	0.19	0.19	0.19	0.19	0.18	0.18
13.793	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.850	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.907	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.964	0.18	0.17	0.17	0.17	0.17	0.17	0.17
14.021	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.078	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.135	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.192	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.249	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.306	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.363	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.420	0.17	0.17	0.17	0.17	0.17	0.16	0.16
14.477	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.534	0.16	0.16	0.16	0.16	0.16	0.16	0.16

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

14.591	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.648	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.705	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.762	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.819	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.876	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.933	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.990	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.047	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.104	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.161	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.218	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.275	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.332	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.389	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.446	0.16	0.16	0.16	0.16	0.16	0.15	0.15
15.504	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.561	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.618	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.675	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.732	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.789	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.846	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.903	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.960	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.017	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.074	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.131	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.188	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.245	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.302	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.359	0.15	0.15	0.15	0.15	0.15	0.15	0.15

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

16.416	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.473	0.15	0.15	0.15	0.14	0.14	0.14	0.14
16.530	0.14	0.14	0.14	0.14	0.14	0.14	0.14

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
16.587	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.644	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.701	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.758	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.815	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.872	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.929	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.986	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.043	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.100	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.157	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.214	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.271	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.329	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.386	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.443	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.500	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.557	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.614	0.13	0.13	0.13	0.13	0.13	0.13	0.13

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

17.671	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.728	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.785	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.842	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.899	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.956	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.013	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.070	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.127	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.184	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.241	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.298	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.355	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.412	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.469	0.13	0.13	0.13	0.12	0.12	0.12	0.12
18.526	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.583	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.640	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.697	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.754	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.811	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.868	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.925	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.982	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.039	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.097	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.154	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.211	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.268	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.325	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.382	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.439	0.12	0.12	0.12	0.12	0.12	0.11	0.11

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Proposed

0 0 0.05

(continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
19.496	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.553	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.610	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.667	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.724	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.781	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.838	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.895	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.952	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.009	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.066	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.123	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.180	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.237	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.294	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.351	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.408	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.465	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.522	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.579	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.636	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.693	0.10	0.10	0.10	0.10	0.10	0.10	0.10

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ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

20.750	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.807	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.864	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.922	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.979	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.036	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.093	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.150	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.207	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.264	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.321	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.378	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.435	0.10	0.09	0.09	0.09	0.09	0.09	0.09
21.492	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.549	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.606	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.663	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.720	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.777	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.834	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.891	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.948	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.005	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.062	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.119	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.176	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.233	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.290	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.347	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:
Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
22.404	0.09	0.08	0.08	0.08	0.08	0.08	0.08
22.461	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.518	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.575	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.632	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.689	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.747	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.804	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.861	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.918	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.975	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.032	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.089	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.146	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.203	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.260	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.317	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.374	0.08	0.07	0.07	0.07	0.07	0.07	0.07
23.431	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.488	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.545	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.602	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.659	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.716	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.773	0.07	0.07	0.07	0.07	0.07	0.07	0.07

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

23.830	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.887	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.944	0.07	0.07	0.07	0.07	0.07	0.07	0.07
24.001	0.07	0.07	0.07	0.07	0.06	0.06	0.06
24.058	0.05						

WinTR-20: Version 1.10 0 0 0.05 (continued)
ed Brea Plaza Redevelop.
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
Total Area	0.004		3.15				
OUTLET	0.004		3.15				

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10
ed Brea Plaza Redevelop.
Proposed

0 0 0.05

(continued)

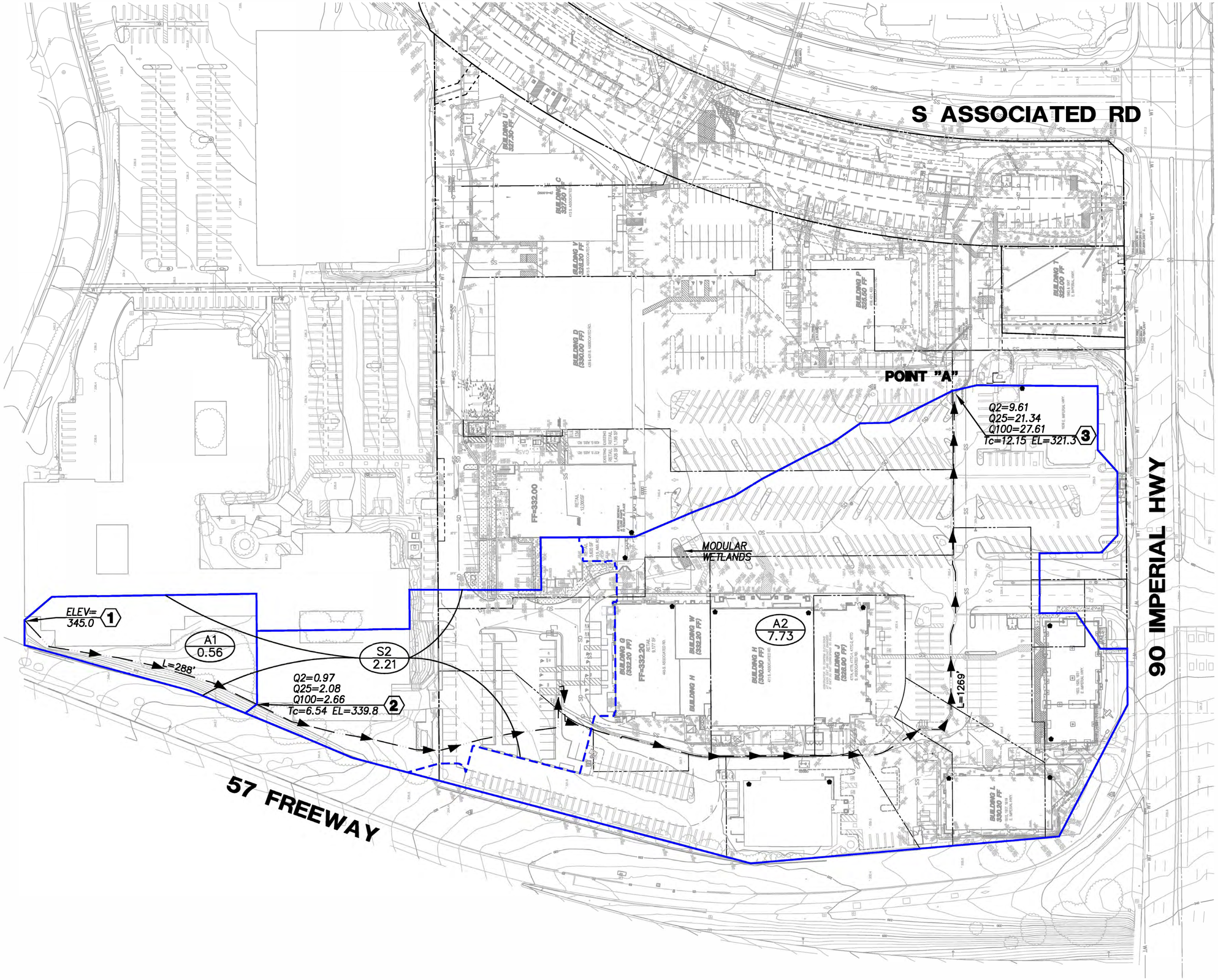
STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

EXHIBITS

EXHIBIT A: EXISTING CONDITION HYDROLOGY MAP



LEGEND:

- A3 / 0.58 — HYDROLOGY SUB-AREA
- S1 / 1.82 — INLET SUB-AREA
- DISCHARGE AT NODE (Q25 cfs): Q25=13.41; Tc=11.37 EL=527.8; NODE NUMBER 4; TIME OF CONCENTRATION; F.S. ELEVATION AT NODE(ft)
- SUBAREA BOUNDARY
- INLET SUBAREA BOUNDARY
- L=205' FLOWPATH
- A2 / 1.83 — SUBAREA DESIGNATION; TRIBUTARY AREA (AC.)
- SOIL TYPE: D
- 12" PVC PIPE
- 24" HDPE PIPE
- PROJECT AREA
- DOWN SPOUTS

NORTH

GRAPHIC SCALE

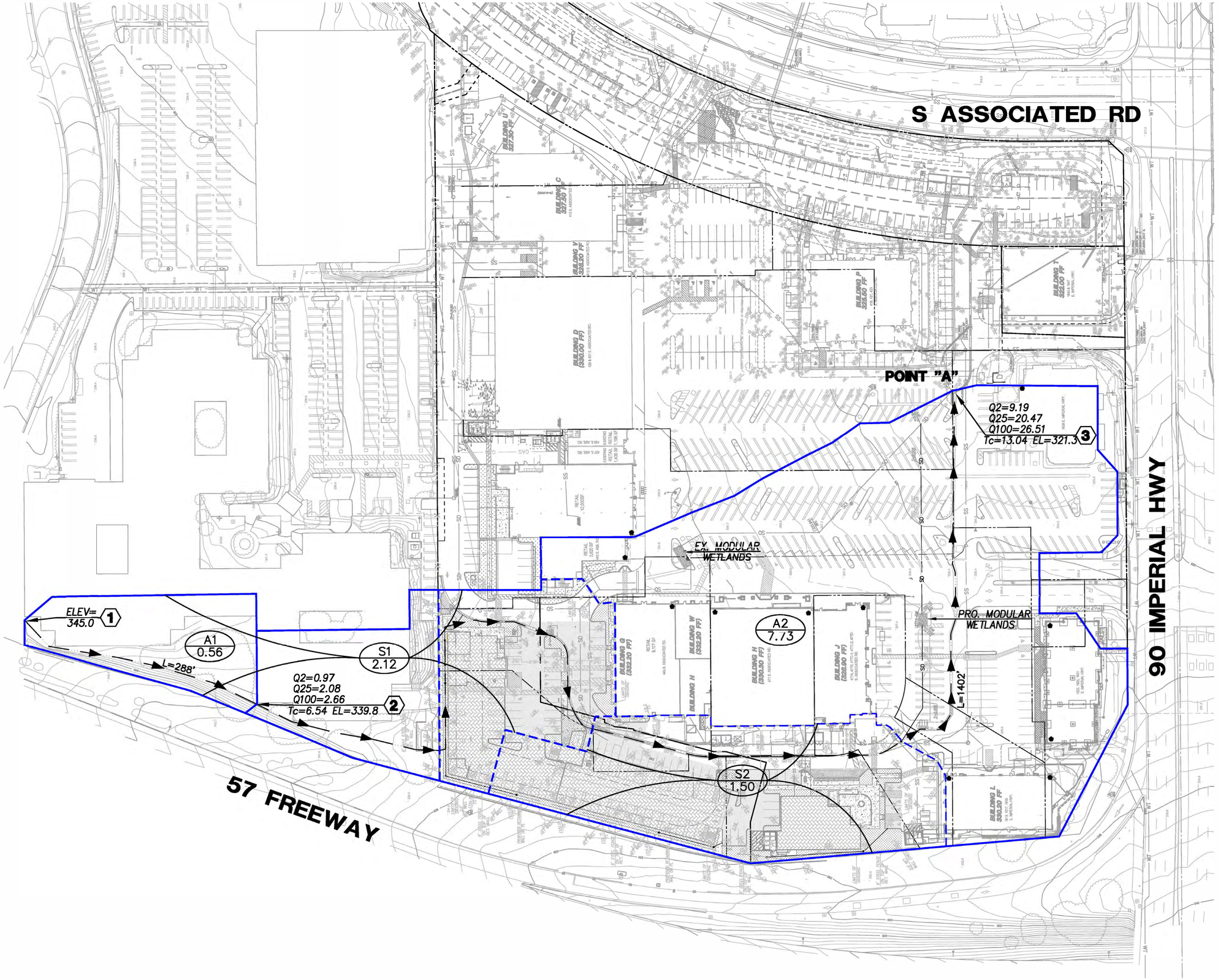
50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

CITY OF BREA

HYDROLOGY MAP (EXISTING CONDITION) BREA PLAZA IMPERIAL HIGHWAY

EXHIBIT B: PROPOSED CONDITION HYDROLOGY MAP



LEGEND:

- A3 / 0.58 — HYDROLOGY SUB-AREA
- S1 / 1.82 — INLET SUB-AREA
- DISCHARGE AT NODE (Q25 cfs): Q25=13.41
- TIME OF CONCENTRATION: Tc=11.37
- NODE NUMBER: 4
- F.S. ELEVATION AT NODE(ft): EL=527.8
- SUBAREA BOUNDARY
- INLET SUBAREA BOUNDARY
- L=205' FLOWPATH
- SUBAREA DESIGNATION
- TRIBUTARY AREA (AC.)
- SOIL TYPE: D
- 12" PVC PIPE
- 24" HDPE PIPE
- PROJECT AREA
- DOWN SPOUTS

NORTH

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

CITY OF BREA

HYDROLOGY MAP (PROPOSED CONDITION) BREA PLAZA IMPERIAL HIGHWAY

EXHIBIT C: SOILS MAP

Search

Properties and Qualities Ratings

Open All | Close All

- Soil Chemical Properties
- Soil Erosion Factors
- Soil Health Properties
- Soil Physical Properties
- **Soil Qualities and Features**
  - AASHTO Group Classification (Surface)
  - AASHTO Group Index
  - Depth to a Selected Soil Restrictive Layer
  - Depth to Any Soil Restrictive Layer
  - Drainage Class
  - Frost Action
  - Frost-Free Days
  - Hydrologic Soil Group

View Description | View Rating

View Options

Map ☑

Table ☑

Description of Rating ☑

Rating Options ☑

☐ Detailed Description

Advanced Options

Aggregation Method: Dominant Condition

Component Percent Cutoff:

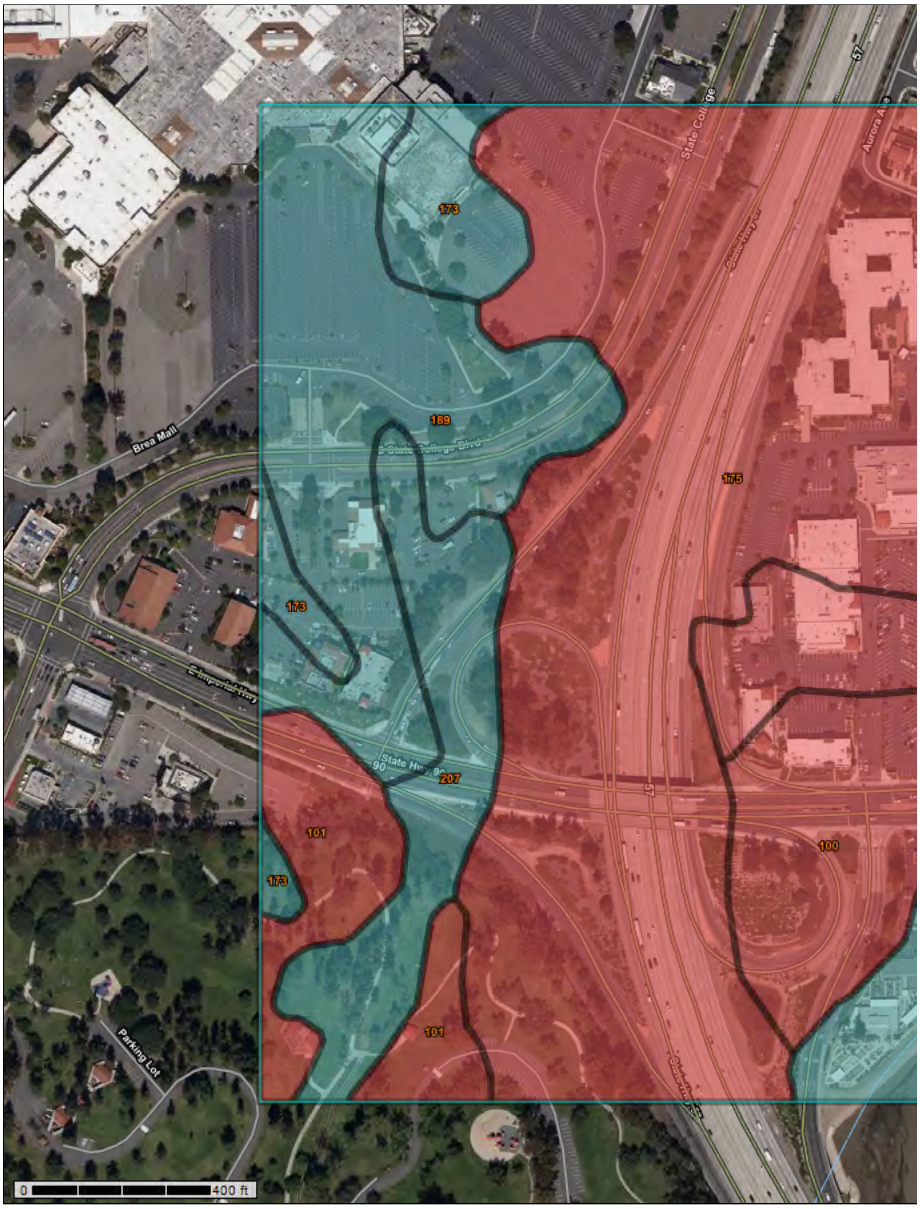
Tie-break Rule: ○ Lower ◉ Higher

View Description | View Rating

  - Map Unit Name
  - Parent Material Name
  - Representative Slope
  - Soil Slippage Potential
  - Unified Soil Classification (Surface)
- Water Features

Map — Hydrologic Soil Group

Scale (not to scale)



Warning: Soil Ratings Map may not be valid at this scale.

You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Ma
design of map units and the level of detail shown in the resulting soil map are dependent on that ma

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of map
been shown at a more detailed scale.

Tables — Hydrologic Soil Group — Summary By Map Unit

Summary by Map Unit — Orange County and Part of Riverside County, California (CA678)

Summary by Map Unit — Orange County and Part of Riverside County, California (CA678)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Totals for Area of Interest			**164.9**	**100.0%**

Summary by Map Unit — Orange County and Part of Riverside County, California (CA678)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
100	Alo clay, 9 to 15 percent slopes	D	34.0	20.7%
101	Alo clay, 15 to 30 percent slopes, dry	D	15.0	9.1%
173	Myford sandy loam, 2 to 9 percent slopes	C	3.7	2.2%
175	Myford sandy loam, 9 to 15 percent slopes	D	48.0	29.1%
189	Rincon clay loam, 9 to 15 percent slopes, MLRA 19	C	13.3	8.0%
207	Sorrento loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	C	25.7	15.6%
217	Xeralfic arents, loamy, 2 to 9 percent slopes		25.2	15.3%
Totals for Area of Interest			**164.9**	**100.0%**

Description — Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options — Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

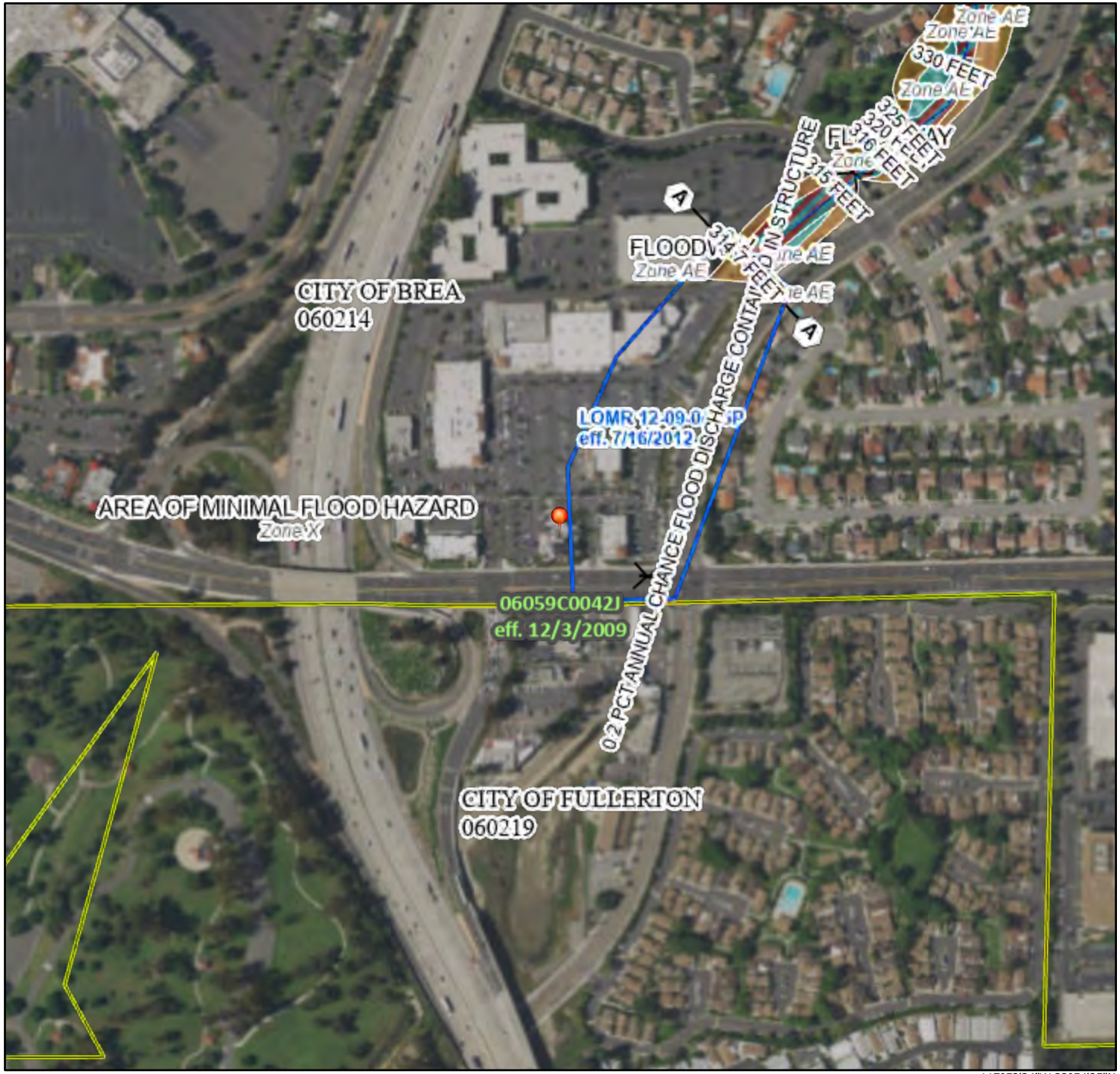
FOIA | Accessibility Statement | Privacy Policy | Non-Discrimination Statement | Information Quality | USA.gov | White House

EXHIBIT D: FIRM MAP

National Flood Hazard Layer FIRMette

FEMA

117°53'11"W 33°54'55"N



117°52'34"W 33°54'25"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

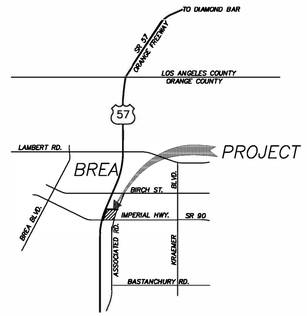
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/6/2023 at 4:32 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

EXHIBIT E: CONCEPTUAL GRADING PLAN SET

BREA PLAZA CONCEPTUAL GRADING PLAN #4

1639 E. IMPERIAL HIGHWAY
BREA, CA



VICINITY MAP

N.T.S.

LEGEND AND ABBREVIATIONS

- EXIST. CURB AND GUTTER
- EXIST. STORM DRAIN
- EXIST. CATCH BASIN
- EXIST. SEWER
- EXIST. WATER LINE
- EXIST. STREET LIGHT
- EXIST. FIRE HYDRANT
- EXIST. POWER POLE
- EXIST. SIGN
- PROP. CURB ONLY
- PROP. CURB & GUTTER
- PROP. BUILDING WALL
- PROP. RED CURB
- EXIST. FENCE
- LIMITS OF GRADING
- BOUNDARY
- PRO. LOT LINE
- EX. LOT LINE
- CENTERLINE
- ADA PATH
- (650) EX. CONTOUR
- GAS GAS GAS LINE
- WT WT PRO. WATER LINE
- SS PRO. SEWER LINE
- SD PRO. STORM DRAIN
- PRO. RETAINING WALL

(624.50) TC — EXISTING ELEVATION
2% — RATE/FLOW
D/W — DRIVEWAY
TC — TOP OF CURB
TYP. — TYPICAL
EVC — END VERTICAL CURVE
EXIST. — EXISTING
EX. — EXISTING
FL — FLOW LINE
FS — FINISH SURFACE
FG — FINISH GRADE
GB — GRADE BREAK
HP — HIGH POINT
LP — LOW POINT
PR./PRO. — PROPOSED
R/W — RIGHT OF WAY
PP — PROTECT IN PLACE
SW — SEWER
— ROOF DRAINS
X.X% — SURFACE GRADES
S=X.XXX — DRAINAGE SLOPE/GRADES
WV — WATER VALVE (WV)
WM — WATER METER (WM)
SIGN
SS — SEWER MANHOLE (SS MH)
FH — FIRE HYDRANT (FH)
PROPOSED LIGHT POLE (LP)

EARTHWORK ESTIMATE	QUANTITIES CUT	FILL
ROUGH GRADING	1,186	646 CY
OVER-EXCAVATION, WORK	11,306 CY	11,306 CY
SUBSIDENCE (0.1')	(283) CY	___CY
SHRINKAGE (9.5%)	(1,186) CY	___CY
SPOILS	___CY	___CY
SUBTOTAL PROJECT EARTHWORK QUANTITIES	11,023 CY	11,952 CY
		929 SHORT

BALANCE ON-SITE WITH SPOILS & CRUSHED A.C. & A.B.

NOTE: EARTHWORK PROVIDED FOR PERMIT COST PURPOSES ONLY. CONTRACTOR IS REQUIRED TO DETERMINE HIS OWN PAY QUANTITIES.

NOTE: SEE CONCEPTUAL UTILITY PLAN FOR SUMMARY OF STORM DRAIN, SEWER, WATER, & OTHER IMPROVEMENTS.

NORTH

CA

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

CERTIFICATION NOTE:

SELF-CERTIFICATIONS FROM A STATE LICENSED PROFESSIONAL ENGINEER OR THIRD-PARTY CERTIFICATIONS ARE REQUIRED OF ALL BMP'S CONSTRUCTED ON THIS PLAN OR FINAL CERTIFICATE OF OCCUPANCY WILL NOT BE GRANTED FROM THE CITY.

C1

FRED CORNWELL R.C.E. 45591

2/20/25
DATE

REGISTERED PROFESSIONAL ENGINEER FRED CORNWELL No. 45591 Exp. 12/31/26 CIVIL STATE OF CALIFORNIA

DATE	BY	REVISION

PREPARED BY:

CA ENGINEERING, INC.
Planning • Engineering • Surveying
4101 BIRCH STREET, STE 140
NEWPORT BEACH, CA 92660
949-724-9480 949-724-9484 FAX

PREPARED FOR:

BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
(248) 792-5071
CONTACT: WAAD J. NADHIR

LAST REV. Feb 20 2025

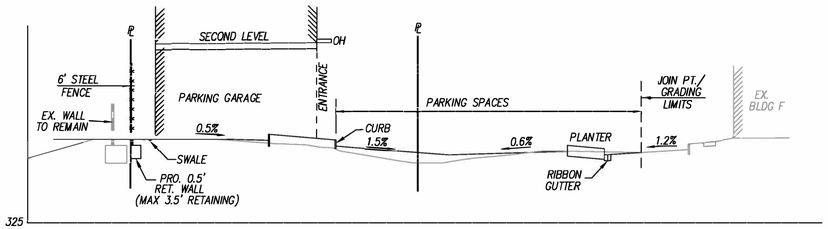
JOB NO. 487-5

Sht. 1 of 2

\\CA-SVR1\Shared\487-5 BREA PLAZA APARTMENTS\CON GRADE\ENG\ Last Modified: 20 Feb 2025 — 12:15pm
Plotted on: 20 Feb 2025 — 12:16pm by cwolf

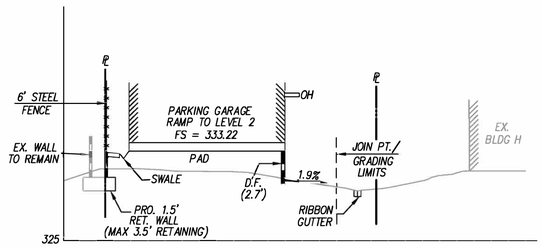
BREA PLAZA CONCEPTUAL GRADING PLAN #4 - SECTIONS

1639 E. IMPERIAL HIGHWAY
BREA, CA



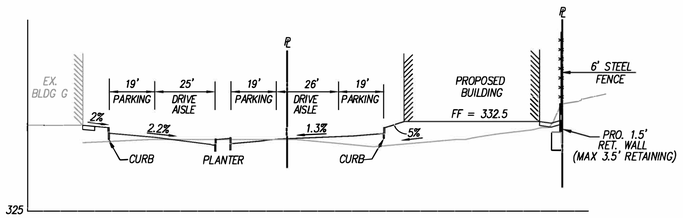
SECTION A-A

SCALE: HOR. 1"=30'; VERT. 1"=6'



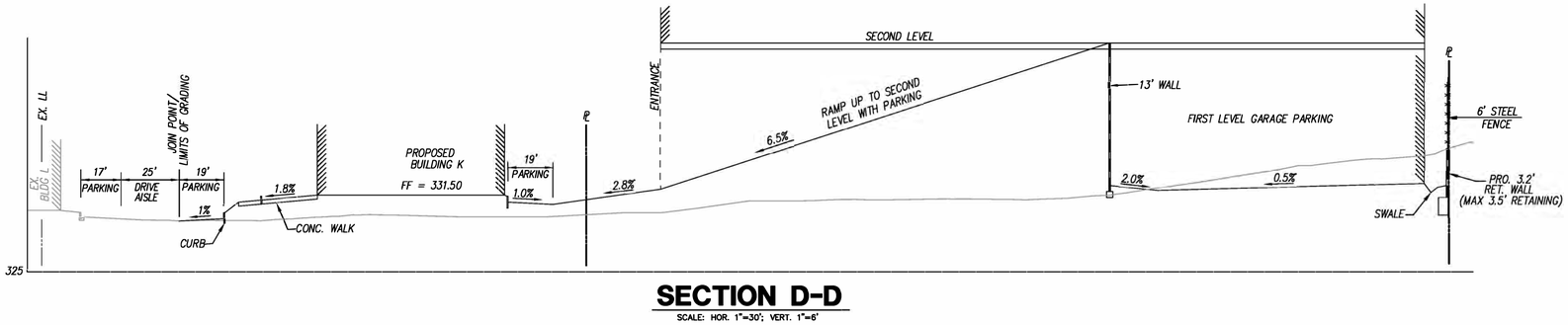
SECTION B-B

SCALE: HOR. 1"=30'; VERT. 1"=6'



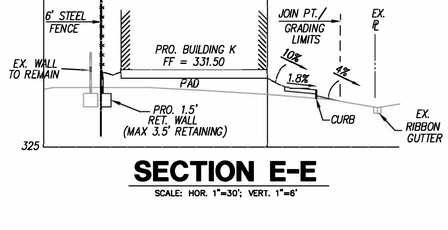
SECTION C-C

SCALE: HOR. 1"=30'; VERT. 1"=6'



SECTION D-D

SCALE: HOR. 1"=30'; VERT. 1"=6'



SECTION E-E

SCALE: HOR. 1"=30'; VERT. 1"=6'

C2

FRED CORNWELL R.C.E. 45591

2/20/25
DATE

REGISTERED PROFESSIONAL ENGINEER FRED CORNWELL No. 45591 Exp. 12/31/26 CIVIL STATE OF CALIFORNIA

DATE	BY	REVISION

PREPARED BY:

CA ENGINEERING, INC.
Planning • Engineering • Surveying
4101 BIRCH STREET, STE 140
NEWPORT BEACH, CA 92660
949-724-9480 949-724-9484 FAX

PREPARED FOR:

BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
(248) 792-5071
CONTACT: WAAD J. NADHIR

LAST REV. Feb 20 2025

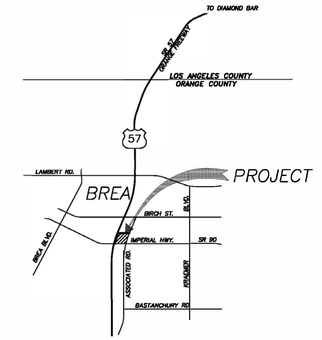
JOB NO. 487-5

Sht. 2 of 2

\\CA-SVR1\Shared\487-5 BREA PLAZA APARTMENTS\DOCS\GRADE\487-5 CON GRADE Last Modified: 20 Feb 2025 - 12:12pm
Modified by: 20 Feb 2025 - 12:04pm by sward

BREA PLAZA CONCEPTUAL UTILITY PLAN #2

1639 E. IMPERIAL HIGHWAY
BREA, CA



VICINITY MAP
N.T.S.

NOTE: ALL ON-SITE PUBLIC WATER EASEMENTS BETWEEN THE EXISTING METER/VAULTS AT THE NORTHERLY AND SOUTHERLY PROPERTY LINES ARE TO BE QUITCLAIMED PER SEPARATE INSTRUMENT.

NOTE: ALL ON-SITE PUBLIC WATER EASEMENTS BETWEEN THE EXISTING METER/VAULTS AT THE NORTHERLY AND SOUTHERLY PROPERTY LINES ARE TO BE QUITCLAIMED PER SEPARATE INSTRUMENT.

LEGEND AND ABBREVIATIONS

- EXIST. CURB AND GUTTER
- EXIST. CATCH BASIN
- EXIST. SEWER
- EXIST. WATER LINE
- EXIST. STREET LIGHT
- EXIST. FIRE HYDRANT
- EXIST. POWER POLE
- EXIST. SIGN
- PROP. CURB ONLY
- PROP. CURB & GUTTER
- PROPOSED BUILDING WALL
- PROPOSED SIDEWALK
- EXIST. FENCE
- PRO. FIRE HYDRANT
- PRO. RETAINING WALL

(624.50) TC — EXISTING ELEVATION
2% — RATE/FLOW
D/W — DRIVEWAY
TC — TOP OF CURB
FH — FIRE HYDRANT
TYP. — TYPICAL
EVC — END VERTICAL CURVE
EXIST. — EXISTING
EX. — EXISTING
FL — FLOW LINE
FS — FINISH SURFACE
FG — FINISH GRADE
GB — GRADE BREAK
HP — HIGH POINT
LP — LOW POINT
PR./PRO. — PROPOSED
R/W — RIGHT OF WAY
PP — PROTECT IN PLACE
SW — SEWER

- CENTERLINE
- (650) EX. CONTOUR
- BOUNDARY LINE
- PROP. LOT LINE

- SD — PROPOSED STORM DRAIN
- SD — EXISTING STORM DRAIN
- SS — PROPOSED SEWER
- SS — EXISTING SEWER
- WT — PROPOSED WATER
- WT — EXISTING WATER
- EXISTING ELECTRIC
- PROPOSED ELECTRIC
- EXISTING TELEPHONE
- PROPOSED MODULAR WETLANDS

NOTE: UTILITIES ARE PROVIDED FOR REFERENCE ONLY AND SEPARATE PERMITS MAY BE REQUIRED.

NOTE: SEE CONCEPTUAL GRADING PLAN FOR DRAINAGE IMPROVEMENTS.

NORTH

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

CERTIFICATION NOTE:

SELF-CERTIFICATIONS FROM A STATE LICENSED PROFESSIONAL ENGINEER OR THIRD-PARTY CERTIFICATIONS ARE REQUIRED OF ALL BMP'S CONSTRUCTED ON THIS PLAN OR FINAL CERTIFICATE OF OCCUPANCY WILL NOT BE GRANTED FROM THE CITY.

C3

FRED CORNWELL R.C.E. 45591

2/20/25
DATE

REGISTERED PROFESSIONAL ENGINEER FRED CORNWELL No. 45591 Exp. 12/31/26 CIVIL STATE OF CALIFORNIA

DATE	BY	REVISION

PREPARED BY:

CA ENGINEERING, INC.
Planning • Engineering • Surveying
13821 NEWPORT AVE., STE 110
TUSTIN, CA 92780
949-724-9480 949-724-9484 FAX

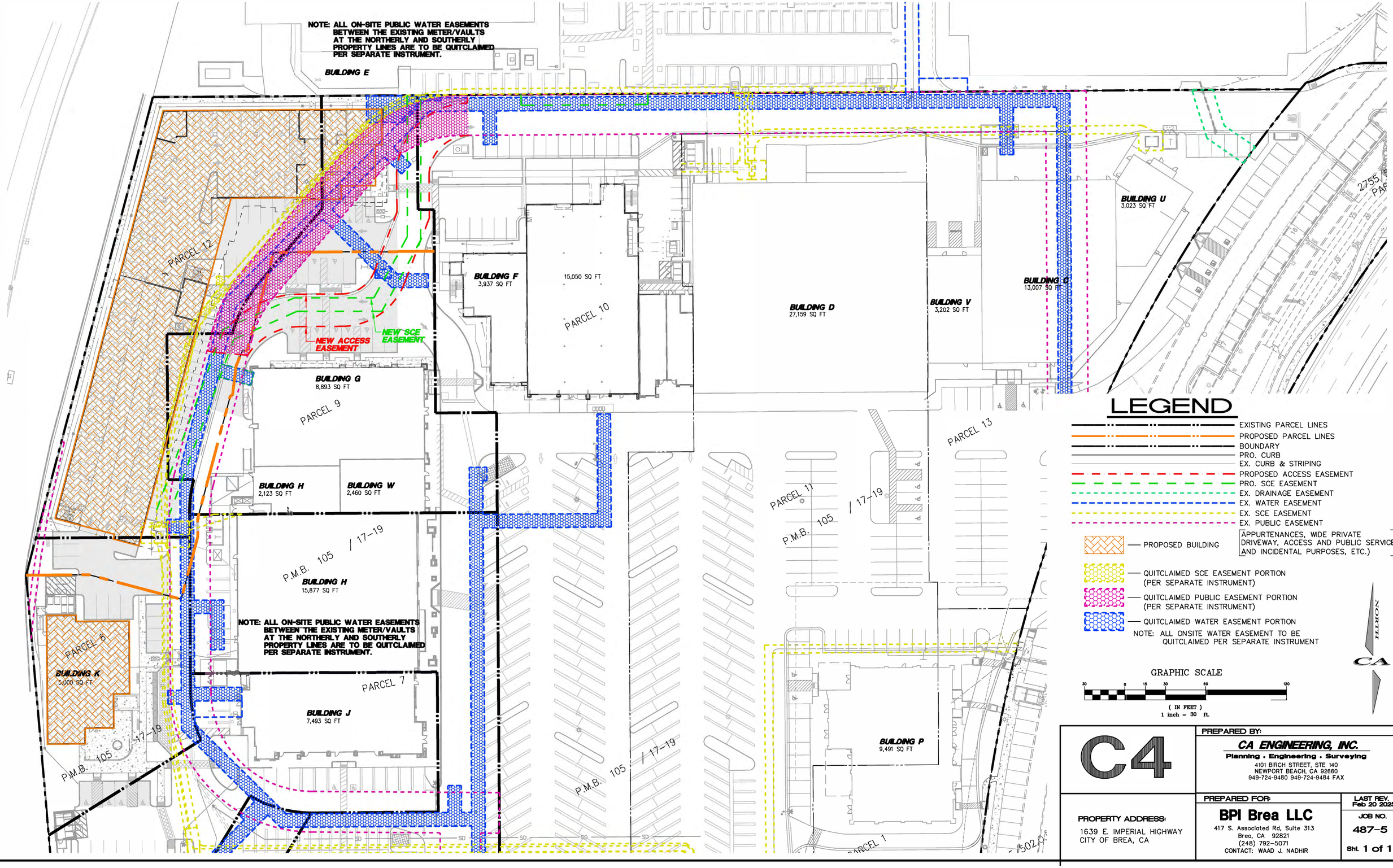
PREPARED FOR:

BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
(248) 792-5071
CONTACT: WAAD J. NADHIR

LAST REV. Feb 20 2025
JOB NO. 487-5
Sht. 1 of 1

\\CA-SVR1\Shared\487-5 BREA PLAZA APARTMENTS\CON GRAPHICS\CON UTILITY 1.dwg Last Modified: 20 Feb 2025 - 12:33pm
Plotted on: 20 Feb 2025 - 12:43pm by award

EASEMENT EXHIBIT



LEGEND

- EXISTING PARCEL LINES
- PROPOSED PARCEL LINES
- BOUNDARY
- PRO. CURB
- EX. CURB & STRIPING
- PROPOSED ACCESS EASEMENT
- PRO. SCE EASEMENT
- EX. DRAINAGE EASEMENT
- EX. WATER EASEMENT
- EX. SCE EASEMENT
- EX. PUBLIC EASEMENT

APPURTENANCES, WIDE PRIVATE DRIVEWAY, ACCESS AND PUBLIC SERVICE AND INCIDENTAL PURPOSES, ETC.)

- PROPOSED BUILDING
- QUITCLAIMED SCE EASEMENT PORTION (PER SEPARATE INSTRUMENT)
- QUITCLAIMED PUBLIC EASEMENT PORTION (PER SEPARATE INSTRUMENT)
- QUITCLAIMED WATER EASEMENT PORTION

NOTE: ALL ONSITE WATER EASEMENT TO BE QUITCLAIMED PER SEPARATE INSTRUMENT

NORTH

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

C4

PREPARED BY:
CA ENGINEERING, INC.
Planning • Engineering • Surveying
4101 BIRCH STREET, STE 140
NEWPORT BEACH, CA 92660
949-724-9480 949-724-9484 FAX

PROPERTY ADDRESS:
1639 E. IMPERIAL HIGHWAY
CITY OF BREA, CA

PREPARED FOR:
BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
(248) 792-5071
CONTACT: WAAD J. NADHIR

LAST REV. Feb 20 2025

JOB NO. 487-5

Sht. 1 of 1

FCS
An ADEC Innovation

Attachment D:

Water Quality Management Plan

CA ENGINEERING

UPDATED BREA PLAZA REDEVELOPMENT PROJECT

1639 E. Imperial Hwy
Brea, CA 92821

Preliminary Water Quality Management Plan

Prepared By:

CA Engineering, Inc.
4101 Birch Street, Suite 140
Newport Beach, CA 92660
949.724.9480 / fcornwell@ca-eng.net

Prepared For:

BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
248.792.5071

Date Prepared: January 7, 2025
Date Revised: February 19, 2025

County of Orange/Santa Ana Region Priority Project

Preliminary Water Quality Management Plan (P-WQMP)

Project Name:

UPDATED BREA PLAZA REDEVELOPMENT PROJECT
(PLN-2022-00078 & PLN-2024-00017)

APN 319-391-01

1639 E. IMPERIAL HIGHWAY
BREA, CA 92821

Prepared for:
BPI Brea LLC
417 S. Associated Road, Suite 313
Brea, CA 92821
248-792-5071

Prepared by:
CA Engineering, Inc.
Fred Cornwell, P.E.
4101 Birch Street, Suite 140
Newport Beach, CA 92660
949-724-9480 (x2012) / fcornwell@ca-eng.net

Date Prepared: January 7, 2025
Date Revised: February 19, 2025

Fred Cornwell, RCE #45591

Project Owner's Certification			
Planning Application No. (If applicable)	**PLN-2022-00078 & PLN-2024-00017**	Grading Permit No.	**BLD-2023-01327 for PLN-2022-00078**
Tract/Parcel Map and Lot(s) No.	**N/A**	Building Permit No.	**BLD-2023-01222 & 01316 for PLN-2022-00078**
Address of Project Site and APN (If no address, specify Tract/Parcel Map and Lot Numbers)			**1639 E. Imperial Hwy. Brea, CA 92821** **APN 319-391-01**

This Water Quality Management Plan (WQMP) has been prepared for BPI Brea LLC by CA Engineering, Inc. The WQMP is intended to comply with the requirements of the County of Orange NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan , including the ongoing operation and maintenance of all best management practices (BMPs), and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Owner:	**BPI Brea LLC**		
Name / Title	Waad J. Nadhir / Authorized Signatory of BOSC Inc.		
Company	BOSC Inc., Manager of BPI Brea LLC		
Address	417 S. Associated Road, Suite 313, Brea, California 92821		
Email	wnadhir@bosc.com		
Telephone #	248-792-5071		
I understand my responsibility to implement the provisions of this WQMP including the ongoing operation and maintenance of the best management practices (BMPs) described herein.			
Owner Signature		Date	

Preparer (Engineer): Fred Cornwell, P.E.			
Title	Principal	PE Registration #	45591
Company	CA Engineering, Inc.		
Address	4101 Birch Street, Suite 140, Newport Beach, CA 92660		
Email	fcornwell@ca-eng.net		
Telephone #	949-724-9480 (x2012)		

I hereby certify that this Water Quality Management Plan is in compliance with, and meets the requirements set forth in, Order No. R8-2009-0030/NPDES No. CAS618030, of the Santa Ana Regional Water Quality Control Board.

Preparer Signature		Date	2-19-2025
Place Stamp Here	REGISTERED PROFESSIONAL ENGINEER FRED CORNWELL NO. 45591 CIVIL STATE OF CALIFORNIA		

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Appendices

Appendix A.....Educational Materials

- .....The Ocean Begins at Your Front Door
- .....Responsible Pest Control
- .....Sewage Spill Reference Guide
- .....Tips for Landscape & Gardening
- .....Tips for Projects Using Paint
- .....Tips for the Food Service Industry
- .....Proper Maintenance Practices for Your Business

Appendix B**.....Post Construction BMP Fact Sheets**

- .....SD-10 Site Design & Landscape Planning
- .....SD-12 Efficient Irrigation
- .....SD-13 Storm Drain Signage
- .....SD-32 Trash Storage Areas
- .....SC-35 Safer Alternative Products
- .....SC-42 Building Repair and Construction
- .....IC3 Building Maintenance
- .....IC7 Landscape Maintenance
- .....IC15 Parking and Storage Area Maintenance
- .....IC17 Spill Prevention and Cleanup
- .....IC21 Waste Handling and Disposal
- .....IC22 Eating and Drinking Establishments

App**endix C**.....Susceptibility Analysis Map for San Gabriel-Coyote Creek Watershed

Appendix D.....Rainfall Zone Map for Orange County

Appendix E**.....**Southern California Geotechnical**, Inc.'s** Geotechnical Feasibility Study, Proposed Brea Plaza Mixed Use Development, NWC Imperial Highway at Associated Road, Brea, California, dated July 30, 2020

Appendix F.....**Southern California Geotechnical, Inc.'s** Results of Infiltration Testing, Proposed Brea Plaza Mixed Use Development, NWC Imperial Highway at Associated Road, Brea, California, dated July 30, 2020

Appendix G.....NRCS Hydrologic Soils Groups Map for Orange County

Appendix H.....Operation and Maintenance (O&M) Plan

Appendix I.....**Record of BMP Implementation, Maintenance and Inspection**

Appendix J.....**Inspection Report for Modular Wetlands System; Cleaning and** Maintenance Report for Modular Wetlands System

Appendix K.....Notice of Transfer of Responsibility for WQMP

Appendix L.....WinTR-55 Program Hydrologic Analysis Reports for the Updated Brea Plaza Redevelopment Project

Appendix M.....**Approved Water Quality Management Plan for Brea Plaza,** dated January 17, 2011 (Stamped Cover Page Only)

Appendix N.....Water Quality Conditions of Approval (To Be Included in Final WQMP)

Appendix O.....**BMP Maintenance Self**-Certification Form for the City of Brea

Appendix P.....City of Brea Project Specific WQMP Summary Report and Project WQMP Summary Exhibit

Appendix Q.....**WQMP**-Related Correspondence

Appendix R.....**County Recorded WQMP Documents**

Exhibits and Attachments Included in Section VI:

- Vicinity Map
- BMP Exhibit (Site Plan) for Proposed Project
- Existing WQMP Drainage Areas Exhibit (Overall Site)
- Oldcastle FloGard +PLUS Catch Basin Insert Filter Specifications and Inspection and Maintenance Guide
- BMP Fact Sheet—BIO-7: Proprietary Biotreatment
- Modular Wetlands System Stormwater Biofiltration Guide (Specifications and Sizing Options) / MWS Linear 2.0 HGL Sizing Calculations Table

- Details for Proposed Modular Wetlands System Units (MWS-L-8-24-**7′**-**8″**-V-HC Model & MWS-L-8-12-Standard Height Model)
- Maintenance Guidelines for Modular Wetlands System
- **State Water Resources Control Board's Certified Full Capture System List of** Trash Treatment Control Devices (Updated May 2021)

Section I Permit(s) and Water Quality Conditions of Approval or Issuance

Project Infomation			
Permit/Application No. (If applicable)	**PLN-2022-00078 & PLN-2024-00017**	Grading or Building Permit No. (If applicable)	**BLD-2023-01327 for PLN-2022-00078**
Address of Project Site (or Tract Map and Lot Number if no address) and APN	**1639 E. Imperial Highway, Brea, CA 92821** **APN 319-391-01**		
Water Quality Conditions of Approval or Issuance			
Water Quality Conditions of Approval or Issuance applied to this project. (Please list verbatim.)	**No Conditions of Approval for the Project have been issued yet.**		
Was a Conceptual Water Quality Management Plan previously approved for this project?	**No. This document is the Preliminary WQMP for the Project.**		
Watershed-Based Plan Conditions			
Applicable Watershed	**San Gabriel-Coyote Creek Watershed**		
Provide applicable conditions from watershed - based plans including WIHMPs and TMDLS.	**WIHMP proposed for San Gabriel-Coyote Creek Watershed but not yet adopted per ocwatershed.com.** **TMDLs for Coyote Creek—Metals (Copper, Lead) and Indicator Bacteria** **TMDLs for San Gabriel River Estuary—Metals (Copper) and Indicator Bacteria**		

Section II Project Description

II.1 Project Description

Description of Proposed Project	
Development Category (From Model WQMP, Table 7.11-2; or -3):	**Significant Redevelopment Project.** Development Category No. 8 from Table 7.II-2 of the Model WQMP defines the following as a priority project for the North Orange County Permit Area: "All significant redevelopment projects, where significant redevelopment is defined as the addition or replacement of 5,000 or more square feet of impervious surface on an already developed site. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the facility, or emergency redevelopment activity required to protect public health and safety. If the redevelopment results in the addition or replacement of less than 50 percent of the impervious area on-site and the existing development was not subject to WQMP requirement, the numeric sizing criteria discussed in Section 7.II-2.0 only applies to the addition or replacement area. If the addition or replacement accounts for 50 percent or more of the impervious area, the Project WQMP requirements apply to the entire development." **The proposed project area is located on an already developed site measuring approximately 13.7 acres. The site is occupied by Brea Plaza, which consists of several commercial buildings, asphalt parking areas/drive aisles, concrete walkways, and landscaping. The existing site also includes four vegetated swales which were constructed to treat stormwater runoff as part of the initial redevelopment of Brea Plaza in 2011. The proposed project will involve the demolition of two buildings and the parking lot, concrete walkways, and landscape areas that are within the project area. The proposed area to be disturbed measures 112,817 square feet (2.59 acres) and comprises approximately 18.9% of the overall site area. While the proposed project will add and/or replace 5,000 or more square feet of impervious surface on an already developed site, the work will result in the addition or replacement of less than 50% of the impervious area on the entire site. Accordingly, the proposed development is a Priority Project, but the numeric sizing criteria only applies to the proposed project area.**

<table>
<tr><td>Land Use</td><td colspan="4">Residential-Apartments/Commercial Development (Mixed Use II)</td></tr>
<tr><td>Project Area (ft²): 112,817</td><td colspan="2">Number of Dwelling Units: 122</td><td colspan="2">SIC Codes: 5999 & 5812</td></tr>
<tr><td rowspan="2">Project Area</td><td colspan="2">Pervious</td><td colspan="2">Impervious</td></tr>
<tr><td>Area
(acres or sq ft)</td><td>Percentage</td><td>Area
(acres or sq ft)</td><td>Percentage</td></tr>
<tr><td>Pre-Project Conditions</td><td>9,984 sq. ft.</td><td>8.8%</td><td>102,833 sq. ft.</td><td>91.2%</td></tr>
<tr><td>Post-Project Conditions</td><td>14,123 sq. ft.</td><td>12.5%</td><td>98,694 sq. ft.</td><td>87.5%</td></tr>
<tr><td>Drainage Patterns/Connections</td><td colspan="4">The overall site where the proposed project will be located is an approximately 13.7 acre existing retail center (Brea Plaza) consisting of six buildings and associated drive aisles and parking lots. The site topography slopes from the northwest corner towards the southeast, and generally ranges from 336± feet mean sea level (msl) in the northern region to 329± feet msl in the southern region.

Brea Plaza was previously redeveloped in 2011. At that time, four concrete box culverts were constructed to replace the previous open trapezoidal channel (Loftus Channel) allowing parking lots to be constructed over the box culverts. In addition, a Water Quality Management Plan, dated January 17, 2011, was prepared for the prior redevelopment project and was approved on February 3, 2011. Pursuant to the 2011 WQMP, the redevelopment project area was divided into four drainage areas, which measured 13.69 acres in total. The low flows from each drainage area delineated in the 2011 WQMP are collected via 12" grated area drains and then conveyed to vegetated swales located along the eastern boundary. After the storm flows are bio-treated in the vegetated swales, they are conveyed to a drainage inlet which discharges to the Loftus box channel. Flows that exceed the design storm flows bypass the grated area drains and are collected by catch basins and conveyed to Loftus Channel directly. An exhibit depicting the existing WQMP drainage areas and vegetated swales, and outlining the new proposed project area, is included in Section VI of this P-WQMP. A copy of the stamped cover page of the 2011 Final WQMP is attached to this P-WQMP as Exhibit M.

Storm flows draining from 2.46 acres of the property to the north sheet</td></tr>
</table>

flow onto the proposed development. These off-site flows were unable to be routed around the proposed project due to grading and site constraints.

The project site has been divided into two drainage areas, and the drainage patterns for the proposed project will remain consistent with the existing drainage patterns. The development is proposing to install Modular Wetlands System ("MWS") units (BIO-7: Proprietary Biotreatment BMPs) for both drainage areas to act as the project's LID BMPs.

In Drainage Area 1, which measures 67,415 square feet (1.55 acres), a new, low flow, area drain system will be installed that will capture both the project area and off-site design storm flows from the property to the north. This system will convey the flows to a MWS unit that will be installed in a landscaped parking lot island located outside of the proposed project area, just south of Building E. After the MWS unit treats the flows, they will be conveyed to an existing catch basin located to the southeast in the middle of the existing shopping center.

The proposed MWS unit for Drainage Area 1 will be sized to treat the project design flow rate of 0.333 cfs as well as the off-site run-on design flow rate—which is 0.445 cfs—for a total required treatment flow rate of 0.778 cfs.

Storm flows from Drainage Area 2, which measures 45,402 square feet (1.04 acres), will sheet flow to a 0.46 acre area to the east of Drainage Area 2 (the "Adjacent Area"). A new, low flow, area drain system will be installed that will capture both the project area design storm flows and the design storm flows from the Adjacent Area. This system will convey the flows to a MWS unit that will be installed in a landscaped parking lot island located outside of the proposed project area, just south of Building J. After the MWS unit treats the flows, they will be conveyed to an existing catch basin located to the southeast in the middle of the existing shopping center.

The proposed MWS unit for Drainage Area 2 will be sized to treat the project design flow rate of 0.215 cfs as well as the Adjacent Area design flow rate—which is 0.104 cfs—for a total required treatment flow rate of 0.319 cfs.

	In addition to LID treatment, FloGard catch basin inserts will be provided to serve as the project's trash treatment control devices pursuant to the Trash Provisions. The catch basin inserts will be sized to treat the 1-year, 1-hour storm event in order to meet the full capture requirements set forth in the Trash Provisions. The MWS units and the catch basin inserts will be located as identified on the BMP Exhibit (Site Plan) included in Section VI of this P-WQMP. The site's storm water flows are discharged to Loftus Channel, which drains to Fullerton Creek, which flows to Coyote Creek, which in turn flows to the San Gabriel River Reach 1 (Estuary to Firestone), which outlets to the Pacific Ocean at the San Gabriel River Estuary. Hydrologic Conditions of Concern potentially exist for the project since not all of the downstream conveyance channels that will receive runoff from the project are engineered, hardened, and regularly maintained to ensure design flow capacity. (See Section II.3 of this P-WQMP.) However, since the post-development run-off volume is less than the pre-development runoff volume, and since the time of concentration is increased in the post-development condition, the project has no HCOCs pursuant to Section 2.2.3.1 of the Technical Guidance Document. (See the WinTR-55 Program Hydrologic Analysis Reports for the Updated Brea Plaza Redevelopment Project, copies of which are attached to this P-WQMP as Appendix L.)
Narrative Project Description: (Use as much space as necessary.)	The proposed project area is located in the northwest portion of Brea Plaza, an approximately 13.7 acre retail shopping center, located at 1639 E. Imperial Highway, in the City of Brea, California. Brea Plaza is bounded to the north by a Mercury Insurance office building, to the west by the Orange Freeway (SR 57), to the south by Imperial Highway, and to the east by Associated Road. The proposed project area measures approximately 112,817 square feet (2.59 acres), which comprises roughly 18.9% of the overall site. The project area is currently developed with a movie theater and restaurant (Buca di Beppo), asphalt drive aisles/parking areas, concrete walkways, and landscaping, and is 91.2% impervious. The proposed project will involve the demolition of the movie theater (Building F) and restaurant (Building K), as well as the asphalt drive aisles/parking areas, concrete walkways, and landscaped planters

within the project area, the construction of a 6-story, 120-unit apartment building and a new Building K, and the remodeling of Buildings E and G. With respect to the proposed apartment building, the bottom two floors will consist of a parking structure, with a main lobby, office, mail room, and bike room located at the ground level. The upper four floors will include studio and one- and two-bedroom apartments, with a fitness center, community room, and an outdoor terrace located at the sixth level. The new Building K will be a 5,000 square foot restaurant space (the existing Building K is 7,500 square feet), with food preparation, cooking, and eating areas. Building E will have 8,300 square feet of retail space added to the ground floor, and a new second floor area constructed that will include a 6,500 square foot office space and a 3,028 square foot outdoor patio. Building G will have a new second floor area constructed that will include an 8,480 square foot office space and a 1,048 square foot outdoor patio. The project will also include new asphalt drive aisles, parking areas, and a loading/service area, concrete walkways, and landscaping. Building G and the existing portion of Building E have been excluded from the project area since the construction of the second floors on these buildings will not increase the disturbed area.

The new building footprints in the project area will total 40,814 square feet, and the asphalt and concrete areas will occupy 57,880 square feet, for a total impervious area of 98,694 square feet, or 87.5% of the project site. The project will also include 14,123 square feet of landscaping, for a total pervious area of 12.5% of the project site.

There are three outdoor trash enclosures proposed for the project, and no streets, roads, or highway projects are planned to be constructed.

There are no known materials or wastes that are anticipated to be used or produced during the operation of the Updated Brea Plaza Redevelopment Project that would be classified as "hazardous." Further, none of the materials to be used at the facility will be stored outside.

The project will not violate any water quality standards because the project will be required to meet the City's NPDES permit discharge requirements.

II.2 Potential Stormwater Pollutants

Urban runoff from a developed site and storm water pollution associated with the runoff has the potential to contribute pollutants to the municipal storm drain system and ultimately to the tributary receiving waters. Pollutants that are commonly associated with urban development include suspended solids/sediment, nutrients, metals, microbial pathogens, oil and grease, toxic organic compounds, and trash and debris. The pollutants of concern for a specific project are based upon the pollutants identified by regulatory agencies as impairing receiving waters, and pollutants that are anticipated or potentially could be generated by the project based on the proposed land uses. Identifying the anticipated/potential pollutants will allow the project WQMP to appropriately assign BMPs to effectively mitigate storm water pollution prior to the runoff discharging off-site.

Table 2.1 of the Orange County Technical Guidance Document("TGD"), dated December 20, 2013, lists the pollutants of concern generated by various land uses and is reprinted below:

Priority Project Categories and/or Project Features	General Pollutant Categories							
	Suspended Solid/ Sediments	Nutrients	Heavy Metals	Pathogens (Bacteria/ Virus)	Pesticides	Oil & Grease	Toxic Organic Compounds	Trash & Debris
Detached Residential Development	E	E	N	E	E	E	N	E
Attached Residential Development	E	E	N	E	E	E(2)	N	E
Commercial/ Industrial Development	E(1)	E(1)	E(5)	E(3)	E(1)	E	E	E
Automotive Repair Shops	N	N	E	N	N	E	E	E
Restaurants	E(1)(2)	E(1)	E(2)	E	E(1)	E	N	E
Hillside Development >5,000 ft²	E	E	N	E	E	E	N	E
Parking Lots	E	E(1)	E	E(4)	E(1)	E	E	E
Streets, Highways, & Freeways	E	E (1)	E	E(4)	E(1)	E	E	E
Retail Gasoline Outlets	N	N	E	N	N	E	E	E

E = expected to be of concern
N = not expected to be of concern

(1) Expected pollutant if landscaping exists on-site, otherwise not expected.
(2) Expected pollutant if the project includes uncovered parking areas, otherwise not expected.
(3) Expected pollutant if land use involves food or animal waste products, otherwise not expected.
(4) Bacterial indicators are routinely detected in pavement runoff.
(5) Expected if outdoor storage or metal roofs, otherwise not expected.

The table below identifies the potential pollutants of concern for the proposed Updated Brea Plaza Redevelopment Project, as set forth in Table 2.1 of the Technical Guidance Document under Attached Residential & Commercial/Industrial Developments and Restaurants:

Pollutants of Concern			
Pollutant	Check One for each: E=Expected to be of concern N=Not Expected to be of concern		Additional Information and Comments
Suspended-Solid/ Sediment	**E**		Identified as an anticipated and/or potential pollutant for Attached Residential & Commercial/Industrial Developments and Restaurants in Table 2.1 of the TGD.
Nutrients	**E**		Identified as an anticipated and/or potential pollutant for Attached Residential & Commercial/Industrial Developments and Restaurants in Table 2.1 of the TGD.
Heavy Metals	**E**		Identified as an anticipated and/or potential pollutant for Commercial/Industrial Developments and Restaurants in Table 2.1 of the TGD.
Pathogens (Bacteria/Virus)	**E**		Identified as an anticipated and/or potential pollutant for Attached Residential & Commercial/Industrial Developments and Restaurants in Table 2.1 of the TGD.
Pesticides	**E**		Identified as an anticipated and/or potential pollutant for Attached Residential & Commercial/Industrial Developments and Restaurants in Table 2.1 of the TGD.

Oil and Grease	**E**		Identified as an anticipated and/or potential pollutant for Attached Residential & Commercial/Industrial Developments and Restaurants in Table 2.1 of the TGD.
Toxic Organic Compounds	**E**		Identified as an anticipated and/or potential pollutant for Commercial/Industrial Developments in Table 2.1 of the TGD.
Trash and Debris	**E**		Identified as an anticipated and/or potential pollutant for Attached Residential & Commercial/Industrial Developments and Restaurants in Table 2.1 of the TGD.

Suspended Solids/Sediment consist of soils or other surficial materials that are eroded and then transported or deposited by wind, water, or gravity. Excessive sedimentation can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth. Sediments in runoff also transport other pollutants that adhere to them, including trace metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and phosphorus. The largest source of suspended solids/sediment is typically erosion from disturbed soils.

Nutrients include the macro-nutrients nitrogen and phosphorus. They commonly exist in the form of mineral salts dissolved or suspended in water and as particulate organic matter transported by storm water. Excessive discharge of nutrients to water bodies and streams can cause eutrophication, including excessive aquatic algae and plant growth, loss of dissolved oxygen, release of toxins in sediment, and significant swings in hydrogen ion concentration (pH). Primary sources of nutrients in urban runoff are fertilizers, trash and debris, and eroded soils. Urban areas with improperly managed landscapes can be substantial sources.

Heavy Metals include certain metals that can be toxic to aquatic life if concentrations become high enough to stress natural processes. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and are also raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. Copper and zinc are typically associated with building materials, including galvanized metal and ornamental copper, and automotive products, including tires and brake pads. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns regarding the potential for release of metals to the environment have already led to restricted metal usage in certain applications, for example lead additives in gasoline. The primary source of metals in urban storm water is typically commercially available metal products and automobiles.

Pathogens (Bacteria / Viruses) include bacteria and viruses, which are ubiquitous microorganisms that thrive under a range of environmental conditions. Water containing excessive pathogenic bacteria and viruses can create a harmful environment for humans and aquatic life. The source of pathogenic bacteria and viruses is typically the transport of animal or human fecal wastes from the watershed, but pathogenic organisms do occur in the natural environment.

Pesticides include pesticides and herbicides comprised of chemical compounds commonly used to control nuisance growth or prevalence of organisms. Water containing excessive pesticides and herbicides can constitute a hazard to humans and aquatic life. Areas with improperly managed landscapes, including excessive or improper application of pesticides and/or herbicides, can be a substantial source.

Oil and Grease are characterized as high-molecular weight organic compounds. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality. Introduction of these pollutants to water bodies may occur due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids.

Toxic Organic Compounds include organic compounds (pesticides, solvents, hydrocarbons) which at toxic concentrations constitute a hazard to humans and aquatic organisms. Storm water coming into contact with organic compounds can transport excessive levels of organics to receiving waters. Dirt, grease, and grime retained in cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life. Sources of organic compounds include landscape maintenance areas, vehicle maintenance areas, waste handling areas, and potentially most other urban areas.

Trash and Debris includes trash, such as paper, plastic, and various waste materials, that can typically be found throughout the urban landscape, and debris which includes waste products of natural origin which are not naturally discharged to water bodies such as landscaping waste, woody debris, etc. The presence of trash and debris may have a significant impact on the recreational value of a water body and upon the health of aquatic habitat.

II.3 Hydrologic Conditions of Concern

[ ] No – Show map (and see discussion below)

[X] Yes – Describe applicable hydrologic conditions of concern below. *Refer to Section 2.2.3 in the TGD.*

Pursuant to Section 2.2.3.1 of the TGD, HCOCs are considered to exist in the North Orange County permit area if any streams located downstream from the project are determined to be potentially susceptible to hydromodification impacts **and** either of the following conditions exists:

- Post-development runoff volume for the 2-yr, 24-hr storm exceeds the pre-development runoff volume for the 2-yr, 24-hr storm by more than 5 percent

OR

- Time of concentration of post-development runoff for the 2-yr, 24-hr storm event is reduced by more than 5 percent as compared to the pre-development condition for the 2-yr, 24-hr storm event. (See Footnote 8 to Section 2.2.3.1 of the TGD.)

The project's receiving waters are potentially susceptible to hydromodification impacts according to the regional stream susceptibility map that is provided in Appendix XVI of the TGD. (See the Susceptibility Analysis Map for San Gabriel-Coyote Creek Watershed, Figure 1 of Appendix XVI.3 of the TGD, a copy of which is attached to this P-WQMP as Appendix C.)

However, as set forth in the chart below, the post-development runoff volume is less than the pre-development runoff volume for a two-year frequency storm event, and the time of concentration is increased in the post-development condition. Therefore, the project does not have an HCOC. In addition, the post-development peak flowrate is also less than the pre-development peak flowrate for a two-year frequency storm event. (See the WinTR-55 Program Hydrologic Analysis Reports for the Updated Brea Plaza Redevelopment Project, copies of which are attached to this P-WQMP as Appendix L. The compliance point for the assessment of the project's pre- and post-development runoff volume and time of concentration is located where runoff leaves the project site, pursuant to Section 5.3.1 of the Technical Guidance Document.)

2-Yr / 24-Hr Storm	Runoff Volume	Time of Concentration (Tc)	Peak Flowrate
Pre-Development	15,024 CF	0.075 Hr (4.50 Minutes)	3.30 CFS
Post-Development	15,015 CF	0.129 Hr (7.74 Minutes)	3.15 CFS
Difference / %	-9 CF / -0.06%	0.054 Hr / 72%	-0.15 CFS / -4.55%

II.4 Post Development Drainage Characteristics

The overall site where the proposed project will be located is an approximately 13.7 acre existing retail center (Brea Plaza) consisting of six buildings and associated drive aisles and parking lots. The site topography slopes from the northwest corner towards the southeast, and generally ranges from 336± feet mean sea level (msl) in the northern region to 329± feet msl in the southern region.

Brea Plaza was previously redeveloped in 2011. At that time, four concrete box culverts were constructed to replace the previous open trapezoidal channel (Loftus Channel) allowing parking lots to be constructed over the box culverts. In addition, a Water Quality Management Plan, dated January 17, 2011, was prepared for the prior redevelopment project and was approved on February 3, 2011. Pursuant to the 2011 WQMP, the redevelopment project area was divided into four drainage areas, which measured 13.69 acres in total. The low flows from each drainage area delineated in the 2011 WQMP are collected via 12" grated area drains and then conveyed to vegetated swales located along the eastern boundary. After the storm flows are bio-treated in the vegetated swales, they are conveyed to a drainage inlet which discharges to the Loftus box channel. Flows that exceed the design storm flows bypass the grated area drains and are collected by catch basins and conveyed to Loftus Channel directly. An exhibit depicting the existing WQMP drainage areas and vegetated swales, and outlining the new proposed project area, is included in Section VI of this P-WQMP. A copy of the stamped cover page of the 2011 Final WQMP is attached to this P-WQMP as Exhibit M.

Storm flows draining from 2.46 acres of the property to the north sheet flow onto the proposed development. These off-site flows were unable to be routed around the proposed project due to grading and site constraints.

The project site has been divided into two drainage areas, and the drainage patterns for the proposed project will remain consistent with the existing drainage patterns. The development is proposing to install Modular Wetlands System ("MWS") units (BIO-7: Proprietary Biotreatment BMPs) for both drainage areas to act as the project's LID BMPs.

In Drainage Area 1, which measures 67,415 square feet (1.55 acres), a new, low flow, area drain system will be installed that will capture both the project area and off-site design storm flows from the property to the north. This system will convey the flows to a MWS unit that will be installed in a landscaped parking lot island located outside of the proposed project area, just south of Building E. After the MWS unit treats the flows, they will be conveyed to an existing catch basin located to the southeast in the middle of the existing shopping center.

The proposed MWS unit for Drainage Area 1 will be sized to treat the project design flow rate of 0.333 cfs as well as the off-site run-on design flow rate—which is 0.445 cfs—for a total required treatment flow rate of 0.778 cfs.

Storm flows from Drainage Area 2, which measures 45,402 square feet (1.04 acres), will sheet flow to a 0.46 acre area to the east of Drainage Area 2 (the "Adjacent Area"). A new, low flow, area drain system will be installed that will capture both the project area design storm flows and the design storm flows from the Adjacent Area. This system will convey the flows to a MWS unit that will be installed in a landscaped parking lot island located outside of the proposed project area, just south of Building J. After the MWS unit treats the flows, they will be conveyed to an existing catch basin located to the southeast in the middle of the existing shopping center.

The proposed MWS unit for Drainage Area 2 will be sized to treat the project design flow rate of 0.215 cfs as well as the Adjacent Area design flow rate—which is 0.104 cfs—for a total required treatment flow rate of 0.319 cfs.

In addition to LID treatment, FloGard catch basin inserts will be provided to serve as the project's trash treatment control devices pursuant to the Trash Provisions. The catch basin inserts will be sized to treat the 1-year, 1-hour storm event in order to meet the full capture requirements set forth in the Trash Provisions. The MWS units and the catch basin inserts will be located as identified on the BMP Exhibit (Site Plan) included in Section VI of this P-WQMP.

The site's storm water flows are discharged to Loftus Channel, which drains to Fullerton Creek, which flows to Coyote Creek, which in turn flows to the San Gabriel River Reach 1 (Estuary to Firestone), which outlets to the Pacific Ocean at the San Gabriel River Estuary. Hydrologic Conditions of Concern potentially exist for the project since not all of the downstream conveyance channels that will receive runoff from the project are engineered, hardened, and regularly maintained to ensure design flow capacity. (See Section II.3 of this P-WQMP.) However, since the post-development run-off volume is less than the pre-development runoff volume, and since the time of concentration is increased in the post-development condition, the project has no HCOCs pursuant to Section 2.2.3.1 of the Technical Guidance Document. (See the WinTR-55 Program Hydrologic Analysis Reports for the Updated Brea Plaza Redevelopment Project, copies of which are attached to this P-WQMP as Appendix L.)

II.5 Property Ownership/Management

All portions of the project and site are owned by BPI Brea LLC. The individual at BPI Brea LLC responsible for this project and all related water quality issues is Waad Nadhir. Mr. Nadhir's contact information is as follows: 417 S. Associated Road, Suite 313, Brea, California 92821; phone number (248) 792-5071; email address wnadhir@bosc.com. All maintenance responsibilities, including the implementation and maintenance of BMPs for the Updated Brea Plaza Redevelopment Project, shall be performed by BPI Brea LLC.

Section III Site Description

III.1 Physical Setting

Name of Planned Community/Planning Area (if applicable)	**N/A**
Location/Address	**1639 E. Imperial Highway, Brea, CA 92821**
General Plan Land Use Designation	**Currently: General Commercial (C-G) / Proposed: Mixed Use II (MU-II)**
Zoning	**Currently: General Commercial (Precise Development) Zone: C-G (P-D) / Proposed: Mixed Use II (MU-II)**
Acreage of Project Site	**2.59 acres**
Predominant Soil Type	**The project area is underlain by artificial fill soils extending to depths of 5½ to 8½± feet below the existing site grades. The artificial fill soils generally consist of medium dense to very dense silty fine sand with trace clay nodules and clayey fine sand, as well as stiff to hard silty clay and fine sandy clay. Under the artificial fill soils, native terrace deposits extend to at least the maximum depth explored of 50± feet below ground surface. The near surface terrace deposits (within the upper 5½ to 22± feet) generally consist of medium dense to very dense fine sand, silty fine sand and occasionally fine sandy silt. Terrace deposits extending deeper than 22± feet generally consist of very stiff to hard silty clay and fine sandy clay, as well as medium dense to very dense fine sand.** **(See pages 7-8 of Southern California Geotechnical, Inc.'s Geotechnical Feasibility Study, Proposed Brea Plaza Mixed Use Development, NWC Imperial Highway at Associated Road, Brea, California, dated July 30, 2020 (the "Geotechnical Report"), a copy of which is attached to this P-WQMP as Appendix E.)** **The soils in the project area are classified as HSG D. (See the NRCS Hydrologic Soils Groups Map for Orange County, Figure XVI-2a of the Technical Guidance Document, a copy of which is attached to this P-WQMP as Appendix G.)**

III.2 Site Characteristics

Site Characteristics	
Precipitation Zone	**0.90 inches** **(See Appendix D of this WQMP—Rainfall Zone Map for Orange County, Figure XVI-1, TGD)**
Topography	**Flat**
Drainage Patterns/Connections	The overall site where the proposed project will be located is an approximately 13.7 acre existing retail center (Brea Plaza) consisting of six buildings and associated drive aisles and parking lots. The site topography slopes from the northwest corner towards the southeast, and generally ranges from 336± feet mean sea level (msl) in the northern region to 329± feet msl in the southern region. Brea Plaza was previously redeveloped in 2011. At that time, four concrete box culverts were constructed to replace the previous open trapezoidal channel (Loftus Channel) allowing parking lots to be constructed over the box culverts. In addition, a Water Quality Management Plan, dated January 17, 2011, was prepared for the prior redevelopment project and was approved on February 3, 2011. Pursuant to the 2011 WQMP, the redevelopment project area was divided into four drainage areas, which measured 13.69 acres in total. The low flows from each drainage area delineated in the 2011 WQMP are collected via 12" grated area drains and then conveyed to vegetated swales located along the eastern boundary. After the storm flows are bio-treated in the vegetated swales, they are conveyed to a drainage inlet which discharges to the Loftus box channel. Flows that exceed the design storm flows bypass the grated area drains and are collected by catch basins and conveyed to Loftus Channel directly. An exhibit depicting the existing WQMP drainage areas and vegetated swales, and outlining the new proposed project area, is included in Section VI of this P-WQMP. A copy of the stamped cover page of the 2011 Final WQMP is attached to this P-WQMP as Exhibit M. Storm flows draining from 2.46 acres of the property to the north sheet flow onto the proposed development. These off-site flows were

unable to be routed around the proposed project due to grading and site constraints.

The project site has been divided into two drainage areas, and the drainage patterns for the proposed project will remain consistent with the existing drainage patterns. The development is proposing to install Modular Wetlands System ("MWS") units (BIO-7: Proprietary Biotreatment BMPs) for both drainage areas to act as the project's LID BMPs.

In Drainage Area 1, which measures 67,415 square feet (1.55 acres), a new, low flow, area drain system will be installed that will capture both the project area and off-site design storm flows from the property to the north. This system will convey the flows to a MWS unit that will be installed in a landscaped parking lot island located outside of the proposed project area, just south of Building E. After the MWS unit treats the flows, they will be conveyed to an existing catch basin located to the southeast in the middle of the existing shopping center.

The proposed MWS unit for Drainage Area 1 will be sized to treat the project design flow rate of 0.333 cfs as well as the off-site run-on design flow rate—which is 0.445 cfs—for a total required treatment flow rate of 0.778 cfs.

Storm flows from Drainage Area 2, which measures 45,402 square feet (1.04 acres), will sheet flow to a 0.46 acre area to the east of Drainage Area 2 (the "Adjacent Area"). A new, low flow, area drain system will be installed that will capture both the project area design storm flows and the design storm flows from the Adjacent Area. This system will convey the flows to a MWS unit that will be installed in a landscaped parking lot island located outside of the proposed project area, just south of Building J. After the MWS unit treats the flows, they will be conveyed to an existing catch basin located to the southeast in the middle of the existing shopping center.

The proposed MWS unit for Drainage Area 2 will be sized to treat the project design flow rate of 0.215 cfs as well as the Adjacent Area design flow rate—which is 0.104 cfs—for a total required treatment flow rate of 0.319 cfs.

In addition to LID treatment, FloGard catch basin inserts will be

	provided to serve as the project's trash treatment control devices pursuant to the Trash Provisions. The catch basin inserts will be sized to treat the 1-year, 1-hour storm event in order to meet the full capture requirements set forth in the Trash Provisions. The MWS units and the catch basin inserts will be located as identified on the BMP Exhibit (Site Plan) included in Section VI of this P-WQMP. The site's storm water flows are discharged to Loftus Channel, which drains to Fullerton Creek, which flows to Coyote Creek, which in turn flows to the San Gabriel River Reach 1 (Estuary to Firestone), which outlets to the Pacific Ocean at the San Gabriel River Estuary. Hydrologic Conditions of Concern potentially exist for the project since not all of the downstream conveyance channels that will receive runoff from the project are engineered, hardened, and regularly maintained to ensure design flow capacity. (See Section II.3 of this P-WQMP.) However, since the post-development run-off volume is less than the pre-development runoff volume, and since the time of concentration is increased in the post-development condition, the project has no HCOCs pursuant to Section 2.2.3.1 of the Technical Guidance Document. (See the WinTR-55 Program Hydrologic Analysis Reports for the Updated Brea Plaza Redevelopment Project, copies of which are attached to this P-WQMP as Appendix L.)
Soil Type, Geology, and Infiltration Properties	**The project area is underlain by artificial fill soils extending to depths of 5½ to 8½± feet below the existing site grades. The artificial fill soils generally consist of medium dense to very dense silty fine sand with trace clay nodules and clayey fine sand, as well as stiff to hard silty clay and fine sandy clay. Under the artificial fill soils, native terrace deposits extend to at least the maximum depth explored of 50± feet below ground surface. The near surface terrace deposits (within the upper 5½ to 22± feet) generally consist of medium dense to very dense fine sand, silty fine sand and occasionally fine sandy silt. Terrace deposits extending deeper than 22± feet generally consist of very stiff to hard silty clay and fine sandy clay, as well as medium dense to very dense fine sand. (See pages 7-8 of the Geotechnical Report attached to this P-WQMP as Appendix E.)** **Two infiltration tests were performed at the subject site. The infiltration rates at these locations range from 0.03 to 0.36 inches per hour. According to the infiltration report prepared by the**

	geotechnical engineer for the project, "The major factors affecting the lack of infiltration at these borings is the presence of medium stiff to hard clayey soils at the test depths. Although an infiltration rate of 0.36 inches per hour was calculated for Infiltration Test No. I-2, negligible infiltration was measured at Infiltration Test No. I-1. Therefore, infiltration is not considered feasible for this site, due to the test results and the type of soils encountered at the boring locations." (See page 6 of Southern California Geotechnical, Inc.'s Results of Infiltration Testing, Proposed Brea Plaza Mixed Use Development, NWC Imperial Highway at Associated Road, Brea, California, dated July 30, 2020 (the "Infiltration Report"), a copy of which is attached to this P-WQMP as Appendix F.)
Hydrogeologic (Groundwater) Conditions	**Groundwater was measured at a depth of 22½± feet below ground surface during the geotechnical engineer's borings. The historic high groundwater at the site is approximately 18± feet below ground surface. (See page 8 of the Geotechnical Report attached to this P-WQMP as Appendix E.)**
Geotechnical Conditions (relevant to infiltration)	**Infiltration at the site is infeasible due to the impermeable soils and low measured infiltration rate of 0.03 inches/hour. (See page 6 of the Infiltration Report attached to this P-WQMP as Appendix F.)**
Off-Site Drainage	**Storm flows draining from 2.46 acres of the property to the north sheet flow onto Drainage Area 1 of the proposed development. These off-site flows were unable to be routed around the proposed project due to grading and site constraints. In Drainage Area 1, a new, low flow, area drain system will be installed that will capture both the project area and off-site design storm flows from the property to the north. This system will convey the flows to a Modular Wetlands System unit for treatment. The proposed MWS unit will be sized to treat the project design flow rate of 0.333 cfs as well as the off-site run-on design flow rate—which is 0.445 cfs—for a total required treatment flow rate of 0.778 cfs.**

Utility and Infrastructure Information	**The only utilities associated with the proposed development are the water, sewer, storm drain, gas and electrical connections. These laterals will supply the necessary utility connections for the proposed development. There are no main lines contained on the site. The proposed Modular Wetlands System units will not interfere with any on-site utilities.**

III.3 Watershed Description

Receiving Waters	**The storm drain discharges to Loftus Diversion Channel, which drains to Fullerton Creek, which flows to Coyote Creek, which in turn flows to the San Gabriel River Reach 1 (Estuary to Firestone), which outlets to the Pacific Ocean at the San Gabriel River Estuary.**
303(d) Listed Impairments	**Coyote Creek: Copper-Dissolved (Metals); Indicator Bacteria (Pathogens); Iron (Metals); Malathion (Pesticides); pH; and Toxicity** **San Gabriel River—Reach 1 (Estuary to Firestone): pH and Water Temperature** **San Gabriel River Estuary : Copper (Metals); Dioxin (other Organics); Indicator Bacteria (Pathogens); Nickel (Metals); and Oxygen-Dissolved (Nutrients)**
Applicable TMDLs	**TMDLs for Coyote Creek—Metals (Copper, Lead) and Indicator Bacteria** **TMDLs for San Gabriel River Estuary—Metals (Copper) and Indicator Bacteria**
Pollutants of Concern for the Project	**Suspended-Solids/Sediment, Nutrients, Heavy Metals, Pathogens (Bacteria/Virus), Pesticides, Oil & Grease, Toxic Organic Compounds, Trash & Debris**
Environmentally Sensitive and Special Biological Significant Areas	**The proposed project does not directly discharge to, and is not within or adjacent to, an ESA.**

Section IV Best Management Practices (BMPs)

IV. 1 Project Performance Criteria

(NOC Permit Area only) Is there an approved WIHMP or equivalent for the project area that includes more stringent LID feasibility criteria or if there are opportunities identified for implementing LID on regional or sub-regional basis?	YES ☐	NO ☒
If yes, describe WIHMP feasibility criteria or regional/sub-regional LID opportunities.	**Not applicable. A WIHMP has been proposed for the San Gabriel-Coyote Creek Watershed, but it has not been adopted yet per ocwatershed.com.**	

Project Performance Criteria	
If HCOC exists, list applicable hydromodification control performance criteria (Section 7.II-2.4.2.2 in MWQMP)	**No HCOCs exist. (See Section II.3 of this P-WQMP.)**
List applicable LID performance criteria (Section 7.II-2.4.3 from MWQMP)	**Priority Projects must infiltrate, harvest and use, evapotranspire, or biotreat/biofilter the 85th percentile of the 24-hour storm event (Design Capture Volume).**
List applicable treatment control BMP performance criteria (Section 7.II-3.2.2 from MWQMP)	**Capture and treat runoff from the 24-hour, 85th percentile storm event, and drawdown the captured/treated volume in 48 hours following end of event.**

Calculate LID design storm capture volume for Project.

The project site contains two drainage areas (Drainage Areas 1 & 2). In addition, storm flows draining from 2.46 acres of the property to the north sheet flow onto Drainage Area 1 of the proposed development. In Drainage Area 1, a new, low flow, area drain system will be installed that will capture both the project area and off-site design storm flows from the property to the north. This system will convey the flows to a MWS unit for treatment.

For Drainage Area 2, a new, low flow, area drain system will be installed that will capture both the project area design storm flows and the design storm flows from the tributary Adjacent Area to the east. This system will convey the flows to a MWS unit for treatment.

The MWS units will act as the project's LID BMPs. The Design Storm Capture Volumes (DCV) and the Design Flow Rates for the areas to be treated by the MWS units have been calculated as set forth below. The detailed calculations used to determine the DCVs and the Design Flow Rates are set forth in Section IV.3.4 of this WQMP.

DRAINAGE AREA 1	ACREAGE OF DRAINAGE AREA	DCV (CF)	DESIGN FLOW RATE (CFS)
Project Area	1.55 AC	4,152	0.333
Off-Site Area	2.46 AC	5,545	0.445
Totals	4.01 AC	9,697	0.778

DRAINAGE AREA 2	ACREAGE OF DRAINAGE AREA	DCV (CF)	DESIGN FLOW RATE (CFS)
Project Area	1.04 AC	2,684	0.215
Adjacent Area	0.46 AC	1,292	0.104
Totals	1.50 AC	3,976	0.319

IV.2. Site Design and Drainage

The overall site where the proposed project will be located is an approximately 13.7 acre existing retail center (Brea Plaza) consisting of six buildings and associated drive aisles and parking lots. The site topography slopes from the northwest corner towards the southeast, and generally ranges from 336± feet mean sea level (msl) in the northern region to 329± feet msl in the southern region.

Brea Plaza was previously redeveloped in 2011. At that time, four concrete box culverts were constructed to replace the previous open trapezoidal channel (Loftus Channel) allowing parking lots to be constructed over the box culverts. In addition, a Water Quality Management Plan, dated January 17, 2011, was prepared for the prior redevelopment project and was approved on February 3, 2011. Pursuant to the 2011 WQMP, the redevelopment project area was divided into four drainage areas, which measured 13.69 acres in total. The low flows from each drainage area delineated in the 2011 WQMP are collected via 12" grated area drains and then conveyed to vegetated swales located along the eastern boundary. After the storm flows are bio-treated in the vegetated swales, they are conveyed to a drainage inlet which discharges to the Loftus box channel. Flows that exceed the design storm flows bypass the grated area drains and are collected by catch basins and conveyed to Loftus Channel directly. An exhibit depicting the existing WQMP drainage areas and vegetated swales, and outlining the new proposed project area, is included in Section VI of this P-WQMP. A copy of the stamped cover page of the 2011 Final WQMP is attached to this P-WQMP as Exhibit M.

Storm flows draining from 2.46 acres of the property to the north sheet flow onto the proposed development. These off-site flows were unable to be routed around the proposed project due to grading and site constraints.

The project site has been divided into two drainage areas, and the drainage patterns for the proposed project will remain consistent with the existing drainage patterns. The development is proposing to install Modular Wetlands System ("MWS") units (BIO-7: Proprietary Biotreatment BMPs) for both drainage areas to act as the project's LID BMPs.

In Drainage Area 1, which measures 67,415 square feet (1.55 acres), a new, low flow, area drain system will be installed that will capture both the project area and off-site design storm flows from the property to the north. This system will convey the flows to a MWS unit that will be installed in a landscaped parking lot island located outside of the proposed project area, just south of Building E. After the MWS unit treats the flows, they will be conveyed to an existing catch basin located to the southeast in the middle of the existing shopping center.

The proposed MWS unit for Drainage Area 1 will be sized to treat the project design flow rate of 0.333 cfs as well as the off-site run-on design flow rate—which is 0.445 cfs—for a total required treatment flow rate of 0.778 cfs.

Storm flows from Drainage Area 2, which measures 45,402 square feet (1.04 acres), will sheet flow to a 0.46 acre area to the east of Drainage Area 2 (the "Adjacent Area"). A new, low flow, area drain system will be installed that will capture both the project area design storm flows and the design storm flows from the Adjacent Area. This system will convey the flows to a MWS unit that will be installed in a landscaped parking lot island located outside of the proposed project area, just south of Building J. After the MWS unit treats the flows, they will be conveyed to an existing catch basin located to the southeast in the middle of the existing shopping center.

The proposed MWS unit for Drainage Area 2 will be sized to treat the project design flow rate of 0.215 cfs as well as the Adjacent Area design flow rate—which is 0.104 cfs—for a total required treatment flow rate of 0.319 cfs.

In addition to LID treatment, FloGard catch basin inserts will be provided to serve as the project's trash treatment control devices pursuant to the Trash Provisions. The catch basin inserts will be sized to treat the 1-year, 1-hour storm event in order to meet the full capture requirements set forth in the Trash Provisions. The MWS units and the catch basin inserts will be located as identified on the BMP Exhibit (Site Plan) included in Section VI of this P-WQMP.

Proprietary biotreatment devices were selected as the project's LID BMPs because infiltration at the site is infeasible due to the impermeable soils and low measured infiltration rate of 0.03 inches/hour, and because there is insufficient available space to construct a traditional biotreatment planter.

The site's storm water flows are discharged to Loftus Channel, which drains to Fullerton Creek, which flows to Coyote Creek, which in turn flows to the San Gabriel River Reach 1 (Estuary to Firestone), which outlets to the Pacific Ocean at the San Gabriel River Estuary. Hydrologic Conditions of Concern potentially exist for the project since not all of the downstream conveyance channels that will receive runoff from the project are engineered, hardened, and regularly maintained to ensure design flow capacity. (See Section II.3 of this P-WQMP.) However, since the post-development run-off volume is less than the pre-development runoff volume, and since the time of concentration is increased in the post-development condition, the project has no HCOCs pursuant to Section 2.2.3.1 of the Technical Guidance Document. (See the WinTR-55 Program Hydrologic Analysis Reports for the Updated Brea Plaza Redevelopment Project, copies of which are attached to this P-WQMP as Appendix L.)

IV.3 LID BMP Selection and Project Conformance Analysis

Each sub-section below documents that the proposed design features conform to the applicable project performance criteria via check boxes, tables, calculations, narratives, and/or references to worksheets.

IV.3.1 Hydrologic Source Controls (HSCs)

Name	Included?
Localized on-lot infiltration	**No**
Impervious area dispersion (e.g. roof top disconnection)	**No**
Street trees (canopy interception)	**No**
Residential rain barrels (not actively managed)	**No**
Green roofs/Brown roofs	**No**
Blue roofs	**No**
Impervious area reduction (e.g. permeable pavers, site design)	**No**

The proposed BMPs, BIO-7: Proprietary Biotreatment (Modular Wetlands System units), will biotreat the entire LID Design Storm Capture Volume. Therefore, Hydrologic Source Controls are not required for the proposed Updated Brea Plaza Redevelopment Project.

IV.3.2 Infiltration BMPs

Name	Included?
Bioretention without underdrains	**No**
Rain gardens	**No**
Porous landscaping	**No**
Infiltration planters	**No**
Retention swales	**No**
Infiltration trenches	**No**
Infiltration basins	**No**
Drywells	**No**
Subsurface infiltration galleries	**No**
French drains	**No**
Permeable asphalt	**No**
Permeable concrete	**No**
Permeable concrete pavers	**No**

It is infeasible to infiltrate the LID Design Storm Capture Volume at the project site due to the impermeable soils and low measured infiltration rate of 0.03 inches/hour. (See page 6 of the Infiltration Report attached to this P-WQMP as Appendix F.)

The proposed LID BMPs, BIO-7: Proprietary Biotreatment (Modular Wetlands System units), will be utilized to biotreat the entire LID Design Storm Capture Volume.

See also Table 2.7 from the Technical Guidance Document below.

Table 2.7: Infiltration BMP Feasibility Worksheet

	Infeasibility Criteria	*Yes*	*No*
1	**Would Infiltration BMPs pose significant risk for groundwater related concerns?** Refer to Appendix VIII (Worksheet I) for guidance on groundwater-related Infiltration feasibility criteria.		**X**
Provide basis: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
2	Would Infiltration BMPs **pose significant risk of increasing risk of geotechnical hazards that cannot be mitigated to an acceptable level?** (Yes if the answer to any of the following questions is yes, as established by a geotechnical expert): • The BMP can only be located less than 50 feet away from slopes steeper than 15 percent. • The BMP can only be located less than eight feet from building foundations or an alternative setback. • A study prepared by a geotechnical professional or an available watershed study substantiates that storm water infiltration would potentially result in significantly increased risks of geotechnical hazards that cannot be mitigated to an acceptable level.		**X**
Provide basis: Summarize findings of studies, provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
3	Would infiltration of the DCV from drainage area **violate downstream water rights?**		**X**
Provide basis: Summarize findings of studies, provide reference to studies, calculations, maps, data sources, etc.			
	Partial Infeasibility Criteria	*Yes*	*No*
4	Is proposed infiltration facility **located on HSG D soils** or the site geotechnical investigation identifies presence of soil characteristics which support categorization as D soils?	**X**	
Provide basis:			

The soils in the project area are classified as HSG D. (See the NRCS Hydrologic Soils Groups Map for Orange County attached to this P-WQMP as Appendix G.)

Summarize findings of studies, provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

5	Is **measured infiltration rate below proposed facility less than 0.3 inches per hour?** This calculation shall be based on the methods described in Appendix VII.	**X**	

Provide basis:

Two infiltration tests were performed at the subject site. The infiltration rates at these locations range from 0.03 to 0.36 inches per hour. According to the infiltration report prepared by the geotechnical engineer for the project, "The major factors affecting the lack of infiltration at these borings is the presence of medium stiff to hard clayey soils at the test depths. Although an infiltration rate of 0.36 inches per hour was calculated for Infiltration Test No. I-2, negligible infiltration was measured at Infiltration Test No. I-1. Therefore, infiltration is not considered feasible for this site, due to the test results and the type of soils encountered at the boring locations." (See page 6 of the Infiltration Report attached to this P-WQMP as Appendix F.)

Summarize findings of studies, provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

6	Would **reduction of over predeveloped conditions cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes or increased discharge of contaminated groundwater to surface waters?**		**X**

Provide citation to applicable study and summarize findings relative to the amount of infiltration that is permissible:

Summarize findings of studies, provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

7	Would **an increase in infiltration over predeveloped conditions cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes or increased discharge of contaminated groundwater to surface waters?**		**X**

Provide citation to applicable study and summarize findings relative to the amount of infiltration that is permissible:

Summarize findings of studies, provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Infiltration Screening Results (check box corresponding to result):			
8	Is there substantial evidence that infiltration from the project would result in a significant increase in I & I to the sanitary sewer that cannot be sufficiently mitigated? (See Appendix XVII) Provide narrative discussion and supporting evidence: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability. **The referenced document is not attached to the current version of the TGD.**		**X**
9	**If any answer from row 1-3 is yes**: infiltration of any volume Is not feasible within the DMA or equivalent. Provide basis: Summarize findings of infeasibility screening		**X**
10	**If any answer from row 4-7 is yes**, infiltration is permissible but is not presumed to be feasible for the entire DCV. Criteria for designing biotreatment BMPs to achieve the maximum feasible infiltration and ET shall apply. Provide basis: Summarize findings of infeasibility screening	**X**	
11	If all answers to rows 1 through 11 are no, infiltration of the full DCV is potentially feasible, BMPs must be designed to infiltrate the full DCV to the maximum extent practicable.	**N/A**	

IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs

Name	Included?
All HSCs; *See Section IV.3.1*	**No**
Surface-based infiltration BMPs	**No**
Biotreatment BMPs	**No**
Above-ground cisterns and basins	**No**
Underground detention	**No**

Pursuant to Tables X.7 and X.8 of the Technical Guidance Document, a project specific evaluation of harvest and use feasibility is not required for the Updated Brea Plaza Redevelopment Project, as documented below.

TUTIA Ratio Thresholds for Minimum Partial Capture:

Pursuant to Section X.3.3 of the TGD, "Table X.7 provides thresholds for TUTIA (Toilet Users to Impervious Area) ratio required to achieve minimum partial capture of the stormwater DCV (i.e. at least 40 percent average annual capture efficiency with a system sized for the DCV). Projects with TUTIA ratios below this value and without other significant demands for harvested water are not required to prepare a project specific evaluation of harvest and use feasibility. The values in Table X.7 reflect the minimum TUTIA ratio required to achieve at least 40 percent average annual capture efficiency with a system sized for the DCV."

Table X.7: Minimum TUTIA for Minimum Partial Capture

Project Type	Residential	Retail and Office Commercial	Industrial	Schools[1]
Basis of Toilet User Calculation	*Resident*	*Employee (non-*	*Employee (non-*	*Employee (non-student)*
Design Capture Storm Depth, inches	**Minimum TUTIA Ratio Required for Minimum Partial Capture (toilet users/impervious acre)**			
0.6	74	98	125	21
0.65	80	106	135	23
0.7	86	114	145	24
0.75	92	122	155	26
0.8	98	130	165	28
0.85	104	138	176	30
0.9	110	146	186	31
0.95	117	154	196	33
1	123	162	206	35

1 – based on employees only; assumes approximately 5 students per employee.

From Table X.7, for a Design Capture Storm Depth of 0.90", the average Minimum TUTIA Ratio Required for Minimum Partial Capture for residential projects is 110 toilet users per impervious acre. The Updated Brea Plaza Redevelopment Project will contain 2.27 impervious acres; therefore, the minimum number of toilet users required for minimum partial capture will be 250 residents. The project will contain 120 apartment units and, assuming an average of two residents per unit, the total number of toilet users for the project is 240 which is below the required minimum. Therefore, no project specific evaluation of harvest and use feasibility based on toilet use is required.

Irrigated Area Thresholds for Minimum Partial Capture

Pursuant to Section X.3.4 of the TGD, "Table X.8 provides thresholds for irrigated area per impervious acre for minimum partial capture of the stormwater DCV. Projects with irrigation area below this value and without other sources of significant demand will generally not be required to prepare a project specific evaluation of harvest and use feasibility. The values in Table X.8 reflect the minimum irrigated area per impervious area required to achieve at least 40 percent average annual capture efficiency with a system sized for the DCV."

Table X.8: Minimum Irrigated Area for Potential Partial Capture Feasibility

General Landscape Type	Conservation Design: K_L = 0.35			Active Turf Areas: K_L = 0.7		
Closest ET Station	*Irvine*	*Santa Ana*	*Laguna*	*Irvine*	*Santa Ana*	*Laguna*
Design Capture Storm Depth, inches	**Minimum Required Irrigated Area per Tributary Impervious Acre for Potential Partial Capture, ac/ac**					
0.60	0.66	0.68	0.72	0.33	0.34	0.36
0.65	0.72	0.73	0.78	0.36	0.37	0.39
0.70	0.77	0.79	0.84	0.39	0.39	0.42
0.75	0.83	0.84	0.90	0.41	0.42	0.45
0.80	0.88	0.90	0.96	0.44	0.45	0.48
0.85	0.93	0.95	1.02	0.47	0.48	0.51
0.90	0.99	1.01	1.08	0.49	0.51	0.54
0.95	1.04	1.07	1.14	0.52	0.53	0.57
1.00	1.10	1.12	1.20	0.55	0.56	0.60

From Table X.8, for a Design Capture Storm Depth of 0.90", the average Minimum Required Irrigated Area per Tributary Impervious Acre for Potential Partial Capture is as follows:

Required Irrigated Area: Average of the three given table values: (0.99+1.01+1.08)/3 = 1.03 ac/ac x Impervious Area of Project of 2.27 acres = 2.34 acres. The project site has 0.32 acres of landscaping which is well below the required minimum. Therefore, no project specific evaluation of harvest and use feasibility based on irrigation demand is required.

The proposed BMPs, BIO-7: Proprietary Biotreatment (Modular Wetlands System units), will biotreat the entire LID Design Storm Capture Volume. Therefore, no other evapotranspiration or rainwater harvesting BMPs will be utilized at the site.

IV.3.4 Biotreatment BMPs

Name	Included?
Bioretention with underdrains	**No**
Stormwater planter boxes with underdrains	**No**
Rain gardens with underdrains	**No**
Constructed wetlands	**No**
Vegetated swales	**No**
Vegetated filter strips	**No**
Proprietary biotreatment systems	**Yes**
Wet extended detention basin	**No**
Dry extended detention basins	**No**

The proposed BIO-7: Proprietary Biotreatment BMPs (Modular Wetlands System units) will biotreat the entire LID Design Storm Flows for the project.

The MWS unit for Drainage Area 1 will be sized to treat a design flow rate of 0.778 cfs (as calculated below).

The proposed MWS unit for Draiange Area 1 has a treatment flowrate of 0.786 cfs. (See the Detail Sheet for MWS unit Model #MWS-L-8-24-7′-8″-V-HC, a copy of which is included in Section VI of this P-WQMP.) Therefore, the treatment flowrate of the selected BIO-7: Proprietary Biotreatment BMP (Modular Wetlands System unit) exceeds the design flowrate of the area required to be treated.

The MWS unit for Drainage Area 2 will be sized to treat a design flow rate of 0.319 cfs (as calculated below).

The proposed MWS unit for Drainage Area 2, Standard Height Model #MWS-L-8-12, has a treatment flowrate of 0.346 cfs. (See the MWS Linear 2.0 HGL Sizing Calculations table, a copy of which is included in Section VI of this P-WQMP.) Therefore, the treatment flowrate of the selected BIO-7: Proprietary Biotreatment BMP (Modular Wetlands System unit) exceeds the design flowrate of the area required to be treated.

PROJECT DRAINAGE AREA 1

Worksheet B: Simple Design Capture Volume Sizing Method

Step 1: Determine the design capture storm depth used for calculating volume				
1	Enter design capture storm depth from Figure III.1, *d* (inches)	d=	0.90	inches
2	Enter the effect of provided HSCs, d_{HSC} (inches) (Worksheet A)	d_{HSC}=	0.00	inches
3	Calculate the remainder of the design capture storm depth, $d_{remainder}$ (inches) (Line 1 – Line 2)	$d_{remainder}$=	0.90	inches
Step 2: Calculate the DCV				
1	Enter Project area tributary to BMP (s), *A* (acres)	A=	1.55	acres
2	Enter Project Imperviousness, *imp* (unitless)	imp=	0.893	
3	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.82	
4	Calculate runoff volume, V_{design}= *(C x* $d_{remainder}$ *x A x 43560 x (1/12))*	V_{design}=	4,152	cu-ft

Flow-based Proprietary BMP Sizing (from TGD Appendix III.3.3 and Worksheet D)

Q = C × i × A x 43,560 ft^2/ac / (12 in/ft x 3600 sec/hr)

For the project area:

Q = design flowrate, cfs

C = runoff coefficient = 0.82 (see Worksheet B above)

i = design intensity (inches) = 0.26 in/hr

A = tributary area (acres) = 1.55 acres

Q = 0.82 x 0.26 in/hr x 1.55 ac x 43,560 ft^2/ac / (12 in/ft x 3600 sec/hr) = 0.333 cfs

OFF-SITE AREA DRAINING ONTO DRAINAGE AREA 1

Worksheet B: Simple Design Capture Volume Sizing Method

Step 1: Determine the design capture storm depth used for calculating volume			
Enter design capture storm depth from Figure III.1, *d* (inches)	d=	0.90	inches
Enter the effect of provided HSCs, d_{HSC} (inches) (Worksheet A)	d_{HSC}=	0.00	inches
Calculate the remainder of the design capture storm depth, $d_{remainder}$ (inches) (Line 1 – Line 2)	$d_{remainder}$=	0.90	inches
Step 2: Calculate the DCV			
Enter Project area tributary to BMP (s), *A* (acres)	A=	2.46	acres
Enter Project Imperviousness, *imp* (unitless)	imp=	0.719	
Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.69	
Calculate runoff volume, V_{design}= *(C x* $d_{remainder}$ *x A x 43560 x (1/12))*	V_{design}=	5,545	cu-ft

Flow-based Proprietary BMP Sizing (from TGD Appendix III.3.3 and Worksheet D)

Q = C × i × A x 43,560 ft2/ac / (12 in/ft x 3600 sec/hr)

For the off-site area draining onto the project area:

Q = design flowrate, cfs

C = runoff coefficient = 0.69 (see Worksheet B above)

i = design intensity (inches) = 0.26 in/hr

A = tributary area (acres) = 2.46 acres

Q = 0.69 x 0.26 in/hr x 2.46 ac x 43,560 ft^2/ac / (12 in/ft x 3600 sec/hr) = 0.445 cfs

Total Design Flowrate to Be Treated: 0.333 cfs + 0.445 cfs = 0.778 cfs

Treatment Flowrate of MWS unit (Model # MWS-L-8-24-7'-8"-V-HC) = 0.786 cfs > 0.778 cfs

PROJECT DRAINAGE AREA 2

Worksheet B: Simple Design Capture Volume Sizing Method

Step 1: Determine the design capture storm depth used for calculating volume				
1	Enter design capture storm depth from Figure III.1, *d* (inches)	d=	0.90	inches
2	Enter the effect of provided HSCs, d_{HSC} (inches) (Worksheet A)	d_{HSC}=	0.00	inches
3	Calculate the remainder of the design capture storm depth, $d_{remainder}$ (inches) (Line 1 – Line 2)	$d_{remainder}$=	0.90	inches
Step 2: Calculate the DCV				
1	Enter Project area tributary to BMP (s), *A* (acres)	A=	1.04	acres
2	Enter Project Imperviousness, *imp* (unitless)	imp=	0.848	
3	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.79	
4	Calculate runoff volume, V_{design}= *(C x* $d_{remainder}$ *x A x 43560 x (1/12))*	V_{design}=	2,684	cu-ft

Flow-based Proprietary BMP Sizing (TGD Appendix III.3.3)

Q = C × i × A x 43,560 ft^2/ac / (12 in/ft x 3600 sec/hr)

For the project area:

Q = design flowrate, cfs

C = runoff coefficient = 0.79 (see Worksheet B above)

i = design intensity (inches) = 0.26 in/hr

A = tributary area (acres) = 1.04 acres

Q = 0.79 x 0.26 in/hr x 1.04 ac x 43,560 ft^2/ac / (12 in/ft x 3600 sec/hr) = 0.215 cfs

ADJACENT AREA TRIBUTARY TO DRAINAGE AREA 2

Worksheet B: Simple Design Capture Volume Sizing Method

Step 1: Determine the design capture storm depth used for calculating volume			
Enter design capture storm depth from Figure III.1, *d* (inches)	d=	0.90	inches
Enter the effect of provided HSCs, d_{HSC} (inches) (Worksheet A)	d_{HSC}=	0.00	inches
Calculate the remainder of the design capture storm depth, $d_{remainder}$ (inches) (Line 1 – Line 2)	$d_{remainder}$=	0.90	inches
Step 2: Calculate the DCV			
Enter Project area tributary to BMP (s), *A* (acres)	A=	0.46	acres
Enter Project Imperviousness, *imp* (unitless)	imp=	0.95	
Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.86	
Calculate runoff volume, V_{design}= *(C x* $d_{remainder}$ *x A x 43560 x (1/12))*	V_{design}=	1,292	cu-ft

Flow-based Proprietary BMP Sizing (TGD Appendix III.3.3)

Q = C × i × A x 43,560 ft2/ac / (12 in/ft x 3600 sec/hr)

For the off-site area draining onto the project area:

Q = design flowrate, cfs

C = runoff coefficient = 0.86 (see Worksheet B above)

i = design intensity (inches) = 0.26 in/hr

A = tributary area (acres) = 0.46 acres

Q = 0.86 x 0.26 in/hr x 0.46 ac x 43,560 ft^2/ac / (12 in/ft x 3600 sec/hr) = 0.104 cfs

Total Design Flowrate to Be Treated: 0.215 cfs + 0.104 cfs = 0.319 cfs

Treatment Flowrate of MWS unit (Model # MWS-L-8-12-Standard Height) = 0.346 cfs > 0.319 cfs

IV.3.5 Hydromodification Control BMPs

Hydromodification Control BMPs	
BMP Name	BMP Description

The proposed Updated Brea Plaza Redevelopment Project's receiving waters are potentially susceptible to hydromodification impacts according to the regional stream susceptibility map that is provided in Appendix XVI of the TGD. (See the Susceptibility Analysis Map for San Gabriel-Coyote Creek Watershed, Figure 1 of Appendix XVI.3 of the TGD, a copy of which is attached to this P-WQMP as Appendix C.)

However, since the post-development run-off volume is less than the pre-development runoff volume, and since the time of concentration is increased in the post-development condition, the project has no HCOCs pursuant to Section 2.2.3.1 of the Technical Guidance Document. (See the WinTR-55 Program Hydrologic Analysis Reports for the Updated Brea Plaza Redevelopment Project, copies of which are attached to this P-WQMP as Appendix L.)

Therefore, no Hydromodification Control BMPs are required.

IV.3.6 Regional/Sub-Regional LID BMPs

Regional/Sub-Regional LID BMPs

The proposed BMPs, BIO-7: Proprietary Biotreatment (Modular Wetlands System units), will biotreat the entire LID Design Storm Capture Volume. Therefore, no Regional/Sub-Regional LID BMPs will be utilized at the site.

IV.3.7 Treatment Control BMPs

Treatment Control BMPs	
BMP Name	BMP Description
The proposed LID BMPs, BIO-7: Proprietary Biotreatment (Modular Wetlands System units), will biotreat the entire LID Design Storm Capture Volume. In addition, the proposed Modular Wetlands System units and the proposed filters for the grated inlets (FloGard +Plus Insert Filters) have been certified by the State Water Resources Control Board as trash treatment control devices that meet the Full Capture System definition. (See the State Water Resources Control Board's Certified Full Capture System List of Trash Treatment Control Devices (Updated May 2021), a copy of which is included in Section VI of this P-WQMP.) There are three catch basin insert filters proposed for the project, and they will be located as identified on the BMP Exhibit (Site Plan) included in Section VI of this P-WQMP. The catch basin inserts will be sized to treat the 1-year, 1-hour storm event in order to meet the full-capture requirements referenced above. No other Treatment Control BMPs will be utilized at the site.	

IV.3.8 Non-Structural Source Control BMPs

Non-Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
N1	Education for Property Owners, Tenants and Occupants	X		
N2	Activity Restrictions	X		
N3	Common Area Landscape Management	X		
N4	BMP Maintenance	X		
N5	Title 22 CCR Compliance (How development will comply)		X	Not applicable. The project site will not require Title 22 CCR compliance since the operation of the project site will not generate hazardous wastes as part of its routine operations.
N6	Local Industrial Permit Compliance		X	Not applicable.
N7	Spill Contingency Plan		X	Not applicable. No hazardous waste is expected to be stored on site.
N8	Underground Storage Tank Compliance		X	Not applicable. No underground storage tanks are proposed.
N9	Hazardous Materials Disclosure Compliance		X	Not applicable. The project will not handle or dispose of hazardous materials as part of its routine operations.
N10	Uniform Fire Code Implementation		X	Not applicable. No hazardous waste is expected to be stored on site.
N11	Common Area Litter Control	X		
N12	Employee Training	X		
N13	Housekeeping of Loading Docks		X	No loading docks are proposed.
N14	Common Area Catch Basin Inspection	X		

N15	Street Sweeping Private Streets and Parking Lots	X		
N16	Retail Gasoline Outlets		X	Not applicable. None proposed.

N1 Property Owner Education

The Owner will review the environmental awareness educational materials and BMP Fact Sheets included in Appendices A and B of this Project WQMP prior to or during the commencement of operations at the Updated Brea Plaza Redevelopment Project. Among other things, these materials will inform the Owner of the impacts of dumping oil, paints, solvents or other potentially harmful chemicals into the storm drain; the proper use and management of fertilizers, pesticides and herbicides in landscaping practices; the impacts of littering and improper watering; and proper maintenance practices for the business.

N2 Activity Restrictions

The Owner shall identify surface water quality protection requirements to ensure that surface water quality activities shall be conducted in conformance with the Project WQMP as it relates to the handling and disposal of contaminants and, through the use of employee training manuals or another equally effective method, shall develop corresponding use restrictions. The use restrictions shall include, but not be limited to, the following:

(a) The Owner shall periodically provide to his employees environmental awareness education materials made available by the local municipalities. These materials will describe the use of chemicals (including car wash chemicals, pesticides and fertilizers) that should be limited to the covered property with no discharge of specified wastes via hosing or other direct discharge to gutter, catch basins, settling basins and storm drains.

(b) The Owner shall require the use of fertilizers and pesticides to be in strict conformance with City and County guidelines.

(c) The Owner shall prohibit the discharge of leaf litter, grass clippings, trash, animal wastes, paint, or masonry wastes to streets or storm drain systems.

(d) The Owner shall prohibit hosing down any paved surface where the result would be the flow of non-storm water into the street or storm drains.

(e) The Owner shall prohibit oil changing or other auto repairs that could discharge pollutants.

N3 Common Area Landscape Management

Management programs will be designed and implemented by the Owner to maintain all of the landscaped areas within the project site. These programs will include how to mitigate the potential dangers of fertilizer and pesticide usage, require that fertilizer and pesticide usage shall be consistent with City and County guidelines, discuss utilization of water-efficient landscaping practices, require that maintenance be consistent with the County Water Conservation Resolution or the City equivalent, and detail the proper disposal of landscape wastes.

The Owner shall implement irrigation and landscaping which will utilize moisture sensors, smart timers, rain shut-off valves and the grouping of plants with similar water requirements in order to prevent excess irrigation and its corresponding runoff. The Owner shall also maintain erosion control devices on the property until adequate vegetation coverage has been achieved following establishment of the landscape plantings.

The Owner shall also perform periodic inspection and adjustment of the automatic irrigation system for valve and sprinkler operation and irrigation spray heads for damage as necessary to ensure adequate moisture delivery without allowing overspray or excessive watering that would lead to unnecessary runoff.

N4 BMP Maintenance

The Owner shall be responsible for implementation of each applicable non-structural BMP as well as scheduling inspection and maintenance cleaning of all applicable structural BMP facilities. The Owner, through its landscape or other maintenance contractor, will be responsible for inspection and maintenance activities in landscape areas. Debris and other water pollutants will be controlled, contained and disposed of in a proper manner by the maintenance contractor. Refer to Section V.

N11 Common Area Litter Control

The Owner will be responsible to provide or arrange for weekly sweeping and trash pick-up at the site. The Owner may contract with its landscape or other maintenance contractor to perform these duties, as well as to conduct weekly inspections of all trash receptacles to make sure lids are closed and pick-up of any excess trash on the ground has occurred, and to note and investigate any trash disposal violations.

N12 Employee Training

The Owner shall establish an education program for his employees and/or contractors to inform and train personnel engaged in maintenance activities regarding the impact of dumping oil, paints, solvents or other potentially harmful chemicals into the storm drain; the proper use of

fertilizers and pesticides in landscaping maintenance practices; and the impacts of littering and improper water disposal.

N14 Common Area Catch Basin Inspection

All catch basin inlets will be inspected and maintained by Owner at least once a year, prior to the rainy season (no later than October 1st of each year), and before and after all major storms

N15 Parking Lot Sweeping

The Owner, through his employees and/or landscaping or other maintenance contractor, shall sweep all parking areas and drive aisles within the project at least once a month, or more often if needed. Debris, sediment and trash picked up during sweeping operations will be deposited in the trash receptacles.

IV.3.9 Structural Source Control BMPs

Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage	X		
S2	Design and construct outdoor material storage areas to reduce pollution introduction		X	Not applicable. No outdoor material storage areas are proposed.
S3	Design and construct trash and waste storage areas to reduce pollution introduction	X		
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	X		
S5	Protect slopes and channels and provide energy dissipation		X	Not applicable. The project site has no slopes or channels.
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)			
S6	Dock areas		X	Not applicable. No dock areas are proposed.
S7	Maintenance bays		X	Not applicable. No maintenance bays are proposed.
S8	Vehicle wash areas		X	Not applicable. No vehicle wash areas are proposed.
S9	Outdoor processing areas		X	Not applicable. No outdoor processing areas are proposed.
S10	Equipment wash areas		X	Not applicable. No equipment wash areas are proposed.
S11	Fueling areas		X	Not applicable. No fueling areas are proposed.
S12	Hillside landscaping		X	Not applicable. No hillside landscaping is proposed.
S13	Wash water control for food preparation areas	X		
S14	Community car wash racks		X	Not applicable. No community car wash racks are proposed.

Structural BMPs shall be installed by the Owner at the Updated Brea Plaza Redevelopment Project through the construction and development of the project. For instance, irrigation systems shall be designed by a licensed landscape architect and installed by a qualified contractor to the specifications and standards of the City of Brea and the County of Orange. Thereafter, these structural source control BMPs shall be maintained by the Owner.

S1 Provide Storm Drain System Stenciling and Signage (CASQA SD-13)

The Owner is responsible for labeling all of the project's storm drain inlets and catch basins with the phrase, "NO DUMPING! DRAINS TO OCEAN," or an equally effective phrase, to alert the public to the destination of pollutants discharged into storm water. This signage is to be included on the project plans. The signage and stenciling shall be maintained for legibility by the Owner.

S3 Design Trash Enclosures to Reduce Pollution Introduction (CASQA SD-32)

Trash enclosure areas will be paved with an impervious surface, and have been designed to not allow run-on from adjoining areas and to divert drainage from adjoining roofs and pavements around the trash enclosure areas. The trash enclosures shall also provide solid roofs to prevent direct precipitation.

In conjunction with maintenance activities, the Owner will be responsible for inspecting the trash enclosures on a weekly basis to ensure that no hazardous materials or other inappropriate materials are being disposed of, and to ensure that trash is not allowed to overflow the provided bins. The Owner shall schedule trash pick-up for disposal of dumpster(s) and free standing trash receptacles weekly of each year. The Owner shall also post signs on or near the dumpsters with the words "Do not dump hazardous materials here" or similar. The Owner shall also repair or replace leaky receptacles.

S4 Use Efficient Irrigation Systems and Landscape Design (CASQA SD-12)

The Owner shall direct its landscaping architect to design the timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the municipal storm drain system. The following methods to reduce excessive irrigation runoff shall be incorporated where determined applicable and feasible:

1. Employing rain shutoff devices to prevent irrigation after precipitation.

2. Designing irrigation systems to each landscape area's specific water requirements.

3. Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.

4. Implementing a landscape plan consistent with County Water Conservation Resolution or city equivalent, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

5. The timing and application methods of irrigation water shall be designed to minimize the runoff of excess irrigation water into the municipal storm drain system.

6. Employing other comparable, equally effective, methods to reduce irrigation water runoff.

7. Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider other design features, such as:

(a) Use mulches (such as wood chips or shredded wood products) in planter areas without ground cover to minimize sediment in runoff.

(b) Install appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant material where possible and/or as recommended by the landscape architect.

(c) Leave a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible.

(d) Choose plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth.

The Owner shall be responsible for implementing and maintaining efficient irrigation systems for all landscaping including but not limited to provisions for water sensors, programmable irrigation cycles, and rain shutoff devices. The irrigation systems shall comply with local and statewide ordinances related to irrigation efficiency. The Owner shall also be responsible for the installation and maintenance of all landscape areas utilizing similar planting materials with similar water requirements to reduce excess irrigation runoff.

S13 Wash Water Control for Food Preparation Areas (IC 22)

Pursuant to State Health & Safety Code 27520, the Owner shall ensure that the proposed restaurant shall have either contained areas or sinks, each with sanitary sewer connections for disposal of wash waters containing kitchen and food wastes. If located outside, the contained areas or sinks shall also be structurally covered to prevent entry of storm water. The Owner shall also provide adequate signs which are appropriately placed stating the prohibition of discharging wash water to the storm drain system.

IV.4 Alternative Compliance Plan (If Applicable)

The proposed BMPs, BIO-7: Proprietary Biotreatment (Modular Wetlands System units), will biotreat the entire LID Design Storm Capture Volume. Therefore, no Alternative Compliance Plan will be utilized at the site.

IV.4.1 Water Quality Credits

<table>
<tr><th colspan="5">Description of Proposed Project</th></tr>
<tr><td colspan="5">Project Types that Qualify for Water Quality Credits (Select all that apply):</td></tr>
<tr><td>☐ Redevelopment projects that reduce the overall impervious footprint of the project site.</td><td colspan="2">☐Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface WQ if not redeveloped.</td><td colspan="2">☐ Higher density development projects which include two distinct categories (credits can only be taken for one category): those with more than seven units per acre of development (lower credit allowance); vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2 or those having more than 18 units per acre (greater credit allowance).</td></tr>
<tr><td colspan="2">☐ Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g. reduced vehicle trip traffic with the potential to reduce sources of water or air pollution).</td><td colspan="2">☐ Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g. bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned</td><td>☐ Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping).</td></tr>
<tr><td>☐Developments with dedication of undeveloped portions to parks, preservation areas and other pervious uses.</td><td>☐ Developments in a city center area.</td><td>☐ Developments in historic districts or historic preservation areas.</td><td>☐ Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories.</td><td>☐ In-fill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.</td></tr>
<tr><td>Calculation of Water Quality Credits (if applicable)</td><td colspan="4">The proposed BMPs, BIO-7: Proprietary Biotreatment (Modular Wetlands System units), will biotreat the entire LID Design Storm Capture Volume. Therefore, no Water Quality Credits will be claimed for the Project WQMP.</td></tr>
</table>

IV.4.2 Alternative Compliance Plan Information

The proposed BMPs, BIO-7: Proprietary Biotreatment (Modular Wetlands System units), will biotreat the entire LID Design Storm Capture Volume. Therefore, no Alternative Compliance Plan will be utilized at the site.

Section V Inspection/Maintenance Responsibility for BMPs

BPI Brea LLC (the owner of the project), shall assume all BMP inspection and maintenance responsibilities for the Updated Brea Plaza Redevelopment Project located in Brea, California.

CONTACT NAME	**Waad Nadhir**
COMPANY	**BPI Brea LLC**
ADDRESS	**417 S. Associated Road, Suite 313** **Brea, CA 92821**
PHONE /EMAIL	**(248) 792-5071 / wnadhir@bosc.com**

A copy of the Operation and Maintenance Plan is attached to the Project WQMP as Appendix H.

A Maintenance Covenant and Agreement (with copies of the Operation and Maintenance Plan and WQMP Site Plan attached) will be recorded in the County Recorder's Office with respect to the Project Property prior to approval of the Final WQMP.

Should the maintenance responsibility be transferred at any time during the operational life of the Updated Brea Plaza Redevelopment Project, a formal notice of transfer shall be submitted to the City of Brea at the time the maintenance responsibility of the property subject to this WQMP is transferred. A Notice of Transfer of Responsibility form is included in Appendix K. The transfer of responsibility shall be incorporated into this WQMP as an amendment.

CERTIFICATION OF BMP MAINTENANCE

The Owner shall verify BMP implementation and ongoing maintenance through inspection, self-certification, survey, or other equally effective measure. The forms that may be used to record the implementation, maintenance, and inspection of BMPs are included in Appendices I and J. A BMP Maintenance Self-Certification Form for the City of Brea, which is to be completed by the Owner and the party responsible for the maintenance and operation of the BMPs, is included in Appendix O.

The Owner shall retain operation, inspection and maintenance records of the project's BMPs, and these records will be made available to the City or County upon request. All records must be maintained for at least five (5) years after the recorded inspection date for the lifetime of the project.

LONG-TERM FUNDING FOR BMP MAINTENANCE

The Owner shall be responsible for long-term funding for BMP maintenance. BMPs shall be maintained throughout the year, and inspection and maintenance activities shall be documented in this WQMP.

ACCESS EASEMENT FOR CITY / COUNTY INSPECTION

None. The City of Brea may conduct verifications to assure that implementation and appropriate maintenance of structural and non-structural BMPs prescribed within this WQMP are taking place at the project site.

The table below identifies the party responsible for performing the inspection and maintenance of each BMP for the Updated Brea Plaza Redevelopment Project, and details the maintenance and inspection activities to be performed and the frequency with which each shall be performed.

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N1. Education for Property Owners, Tenants and Occupants (Non-Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	Educational materials shall be reviewed and made available on-site prior to commencement of operation of the Updated Brea Plaza Redevelopment Project. Refer to Appendices A and B of the Project WQMP for a list of applicable educational materials and BMP Fact Sheets.	Upon occupancy, and annually thereafter
N2. Activity Restrictions (Non-Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	The owner shall include in any employee training manual, lease, and/or CCRs the on-site activity restrictions, including but not limited to: (1) No hosing down of any paved surface where the water would flow directly to the street, gutter or storm drain; (2) No car washing outside of established community car wash areas (if any); and (3) No disposal of wash water in the street, gutter or storm drain—all wash water must be disposed of in a mop sink or an area with a floor drain.	Continuous

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N3. Common Area Landscape Management (Non-Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	Ongoing maintenance must be consistent with the City's adopted water conservation ordinance, plus fertilizer and pesticide usage consistent with the "County Management Guidelines for Use of Fertilizers and Pesticides." Landscaping irrigation systems shall be adjusted and properly maintained to prevent over spray runoffs. Green waste shall not be blown or swept into, or disposed of, in the street, gutter, public right-of-way, or storm drain catch basins or inlets. Leaf blowers, if used, shall be used to move green waste into piles so they can be swept and picked up and disposed of in green waste recycling containers.	Weekly

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N4. BMP Maintenance (Non-Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	Owner shall be responsible for implementation of each non- structural BMP and regularly scheduled cleaning of all BMP structural facilities. Records of inspections and BMP maintenance shall be maintained by the owner and shall be available for review upon request.	Continuous
N11. Common Area Litter Control (Non-Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	An adequate number of trash receptacles shall be provided at the site. Litter patrol, emptying of trash receptacles at the facility, violation investigation, reporting and other litter control activities shall be performed in conjunction with maintenance activities.	Weekly

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N12. Employee Training (Non-Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	The Owner shall prepare a training manual(s) for existing and future employees. The manual should include information on non-point source pollution and how to use proper Best Management Practices (BMPs) to minimize runoff pollutants. Training shall be provided upon hire and at regular intervals thereafter.	Upon hire, and annually thereafter

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N14. Common Area Catch Basin Inspection (Non-Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	The catch basins will be inspected, cleaned and maintained on an annual basis, in the early fall prior to the start of the rainy season, and before and after all major storms.	Annually, and before and after all major storms
N15. Street Sweeping Private Streets and Parking Lots (Non-Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	The Owner or his agent must sweep all drive aisles and parking areas regularly (minimum monthly), and prior to the storm season (no later than October 1st each year). Sweeping shall be done with a vacuum-type sweeper. Under no circumstances are outdoor areas/lots to be rinsed or washed with water unless said rinse/wash water is collected and disposed of properly (i.e. into the sewer).	Monthly

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
S1. Provide Storm Drain System Stenciling and Signage (Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	Storm drain stencils shall be inspected for legibility, at a minimum, once prior to the storm season, and no later than October 1st of each year. Those signs determined to be illegible will be re-stenciled as soon as possible.	Annually
S3. Design Trash Enclosures to Reduce Pollutant Introduction (Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	Owner will be responsible for inspecting the trash enclosures on a weekly basis to ensure that no hazardous materials or other inappropriate materials are being disposed of, and to ensure that trash is not allowed to overflow the provided bins. The Owner shall schedule weekly trash pick-up. The Owner shall also repair or replace leaky receptacles.	Weekly

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
S4. Use Efficient Irrigation Systems & Landscape Design (Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	Projects shall design the timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the municipal storm drain system. Irrigation practices shall comply with local and statewide ordinances related to irrigation efficiency.	Continuous
S13. Wash Water Control for Food Preparation Areas (Structural Source Control BMP)	**BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com**	Owner shall ensure that the proposed restaurant shall have either contained areas or sinks, each with sanitary sewer connections for disposal of wash waters containing kitchen and food wastes. If located outside, the contained areas or sinks shall also be structurally covered to prevent entry of storm water. The Owner shall also provide adequate signs which are appropriately placed stating the prohibition of discharging wash water to the storm drain system.	Continuous

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
Treatment Control BMP #1 Proprietary Catch Basin Insert Filters (Oldcastle FloGard +Plus Insert Filters or Approved Equivalent)	**BPI Brea LLC (Owner)** **417 S. Associated Road, Suite 313** **Brea, CA 92821** **Contact: Waad Nadhir** **wnadhir@bosc.com**	Twice a year, prior to and after the rainy season, and after major storm events, the catch basin insert filters shall be visually inspected for damage, have all sediment and debris removed, and the filter medium pouches shall be replaced if necessary. The owner may conduct this maintenance himself, or may enter into a service contract for the maintenance of the insert filters as detailed in the Oldcastle FloGard +Plus Specs/Maintenance Requirements brochure, located in Section VI of the Project WQMP.	Every Six Months (Approximately April 1st and October 1st) and Immediately After Major Storm Events

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
LID BMP # 1 (Biotreatment) Modular Wetlands System Units (BIO-7: Proprietary Biotreatment)	**BPI Brea LLC (Owner)** **417 S. Associated Road, Suite 313** **Brea, CA 92821** **Contact: Waad Nadhir** **wnadhir@bosc.com**	The Modular Wetlands System units are to be maintained monthly as part of routine landscape maintenance activities, and shall be visually inspected monthly and immediately after major storm events to remove collected litter and foreign debris from the screening device. Every 12 to 24 months, the following maintenance should be performed: remove sediment from the Separation Chamber, replace the Cartridge Filter Media, and replace the Drain Down Filter Media. Additional/detailed maintenance instructions for the Modular Wetlands System are contained in the "Maintenance Guidelines for Modular Wetlands System," a copy of which is included in Section VI of the project WQMP.	Screening Device Maintenance: Monthly And Immediately After Major Storm Events Separation Chamber, Cartridge Filter Media, and Drain Down Filter Media Maintenance: Every 12 to 24 Months

Section VI BMP Exhibit (Site Plan)

VI.1 BMP Exhibit (Site Plan)

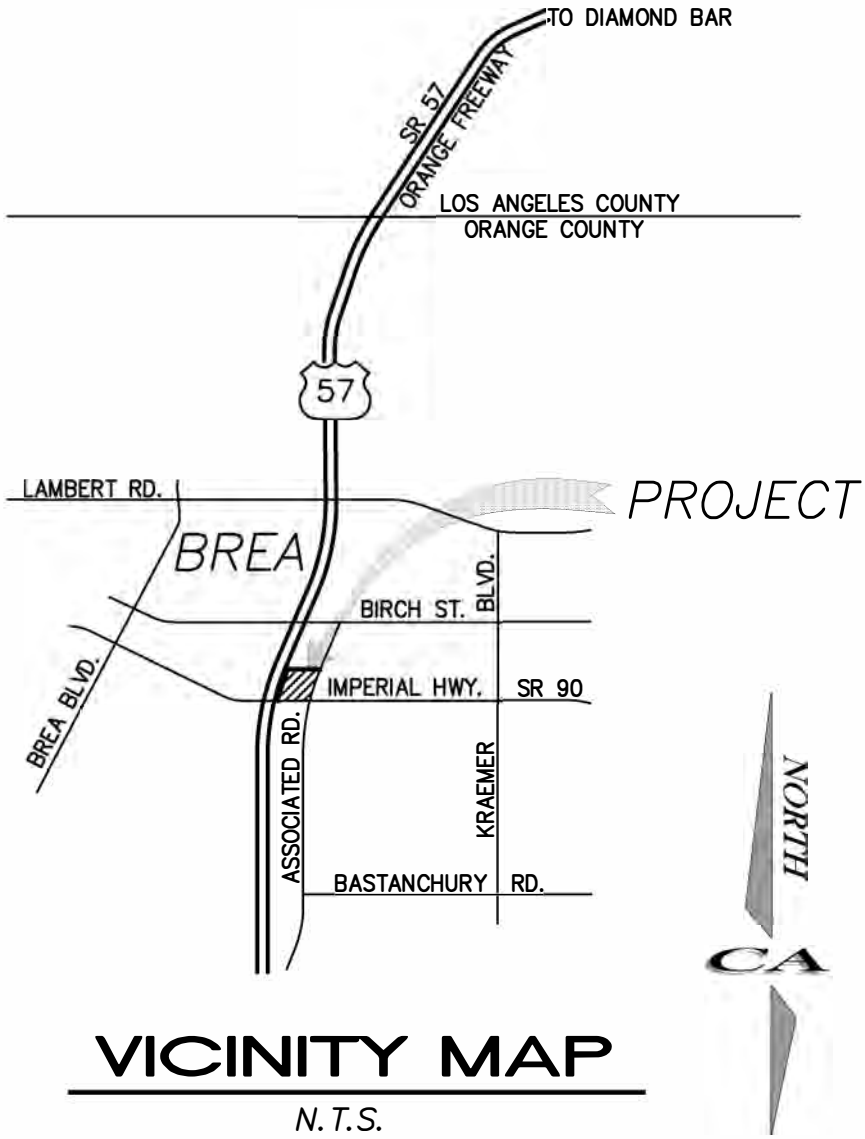
The following documents are included in this section of the WQMP:

- **Vicinity Map**
- **BMP Exhibit (Site Plan) for Proposed Project**
- **Existing WQMP Drainage Areas Exhibit (Overall Site)**
- **Oldcastle FloGard +PLUS Catch Basin Insert Filter Specifications and Inspection and Maintenance Guide**
- **BMP Fact Sheet—BIO-7: Proprietary Biotreatment**
- **Modular Wetlands System Stormwater Biofiltration Guide (Specifications and Sizing Options) / MWS Linear 2.0 HGL Sizing Calculations Table**
- **Details for Proposed Modular Wetlands System Units (MWS-L-8-24-7′-8″-V-HC Model & MWS-L-8-12-Standard Height Model)**
- **Maintenance Guidelines for Modular Wetlands System**
- **State Water Resources Control Board's Certified Full Capture System List of Trash Treatment Control Devices (Updated May 2021)**

VI.2 Submittal and Recordation of Water Quality Management Plan

Following approval of the Final Project-Specific WQMP, the approved WQMP (including BMP Exhibit, Operations and Maintenance (O&M) Plan, and Appendices) shall be recorded in the Orange County Clerk-Recorder's Office prior to close-out of grading and/or building permit. Educational Materials are not required to be included.

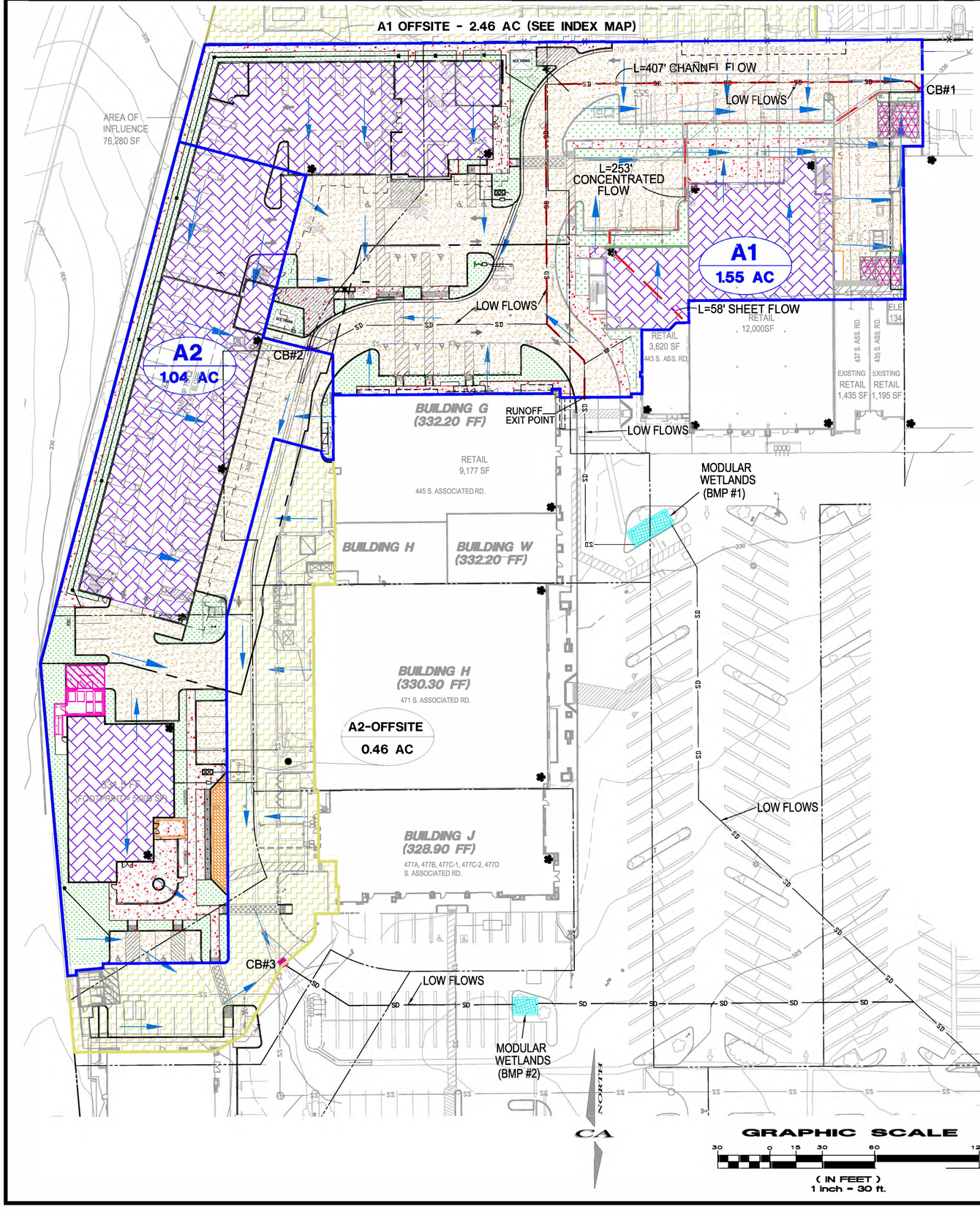
VICINITY MAP



VICINITY MAP

N.T.S.

BMP EXHIBIT (SITE PLAN)
FOR PROPOSED PROJECT



WATER QUALITY CALCULATIONS
AREA 1 + OFFSITE : MODULAR WETLANDS UNIT SIZING

AREA 1 – 67,415 SF / 1.55 AC (89.3% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.893 + 0.15 = 0.82
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 1.55 AC
DESIGN FLOWRATE (Qd) = 0.82 * 0.26in/hr * 1.55 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.333 cfs

OFF-SITE

AREA – 107,253 SF / 2.46 AC (71.9% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.719 + 0.15 = 0.69
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 2.46 AC
OFFSITE DESIGN FLOWRATE (Qd)
= 0.69 * 0.26in/hr * 2.46 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.445 cfs

TOTAL TO BE TREATED: 0.333 + 0.445 = 0.778

MODULAR WETLANDS SELECTED SIZING : MWS-L-8-24-7'-8"-V-HC (8' x 24' BOX)
HIGH CAPACITY MODEL – 3.90
TREATMENT FLOW RATE (Qf) = 0.786 cfs
TREATMENT FLOW RATE (Qf) > DESIGN FLOWRATE (Qd)
0.786 cfs > 0.778 cfs

WATER QUALITY CALCULATIONS
AREA 2 + OFFSITE : MODULAR WETLANDS UNIT SIZING

AREA 2 – 45,402 SF / 1.04 AC (84.8% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.848 + 0.15 = 0.79
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 1.04 AC
DESIGN FLOWRATE (Qd) = 0.79 * 0.26in/hr * 1.04 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.215 cfs

OFF-SITE

AREA – 20,111 SF / 0.46 AC (95.0% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.950 + 0.15 = 0.86
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 0.46 AC
OFFSITE DESIGN FLOWRATE (Qd)
= 0.86 * 0.26in/hr * 0.46 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.104 cfs

TOTAL TO BE TREATED: 0.215 + 0.104 = 0.319

MODULAR WETLANDS SELECTED SIZING : MWS-L-8-12 (8' x 12' BOX)
STANDARD HEIGHT MODEL – 3.40
TREATMENT FLOW RATE (Qf) = 0.346 cfs
TREATMENT FLOW RATE (Qf) > DESIGN FLOWRATE (Qd)
0.346 cfs > 0.319 cfs

BMP LOCATIONS

BMP#1 – MWS (LAT: 33.912314° / LONG: -117.881847°)
BMP#2 – MWS (LAT: 33.911558° / LONG: -117.882055°)
CB#1 (LAT: 33.913010° / LONG: -117.881346°)
CB#2 (LAT: 33.912581° / LONG: -117.882471°)
CB#3 (LAT: 33.911630°/ LONG: -117.882522°)

CATCH BASIN FILTER MODEL NO.

CB#1,2, & 3 TO USE OLDCASTLE FILTER MODEL NO. FGP-24F

LEGEND: STRUCTURAL / TREATMENT BMPS

- LANDSCAPE AREA EFFICIENT IRRIGATION / LANDSCAPE AREA RUNOFF-MINIMIZING DESIGN
- MODULAR WETLANDS
- FLOW PATTERN
- DRAINAGE AREAS **A1**
- BUILDING PAD AREAS
- CONCRETE (DRIVEWAY/GUTTERS/SIDEWALKS)
- DRIVE AISLES
- CATCH BASINS W/ INSERT FILTERS & STENCIL SIGNAGE
- SD — STORM DRAIN
- FLOW PATH
- TRIBUTARY OFFSITE AREAS

PROJECT DATA:

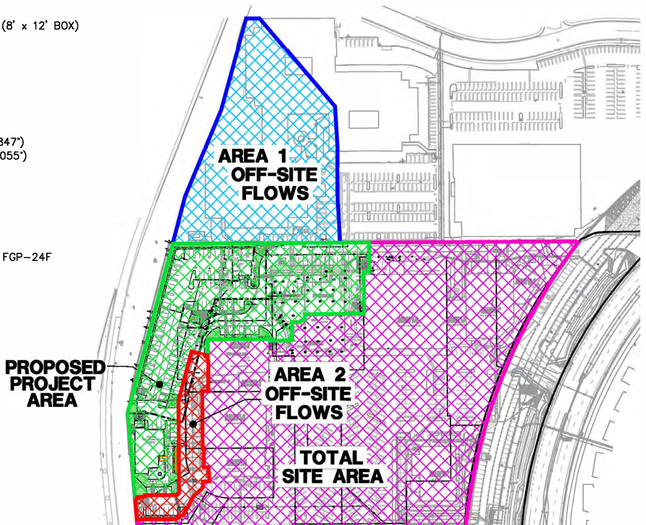
TOTAL SITE AREA: 13.7 AC
TOTAL PROPOSED AREA: 2.59 AC (112,817 SF)

BUILDING FOOTPRINT : 40,814 SF
DRIVE AISLES & LOADING AREA: 43,716 SF
CONCRETE HARDSCAPE/OTHER: 14,164 SF

14,123 SF LANDSCAPING
(12.5% PERVIOUS AREA)

CURRENT USE: COMMERCIAL
PROPOSED USE: COMMERCIAL/RESIDENTIAL

WATERSHED:
SAN GABRIEL-COYOTE CREEK WATERSHED



INDEX MAP

SCALE: 1"=150'

CERTIFICATION NOTE:

SELF-CERTIFICATION FROM A STATE LICENSED PROFESSIONAL ENGINEER OR THIRD-PARTY CERTIFICATIONS ARE REQUIRED OF ALL BMP'S CONSTRUCTED ON THIS PLAN AND ALL BMP'S SHALL BE CLEANED AND IN WORKING CONDITION AS PRESCRIBED BY THE MANUFACTURER TO OBTAIN CERTIFICATE OF OCCUPANCY FROM THE CITY OF BREA.

C4

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PREPARED BY:
CA ENGINEERING, INC.
Planning • Engineering • Surveying
4101 BIRCH STREET
NEWPORT BEACH, CA 92660
949-724-9480 949-724-9484 FAX

OWNER:
BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
CONTACT: WAAD J. NADHIR
TELEPHONE: (248) 792-5071

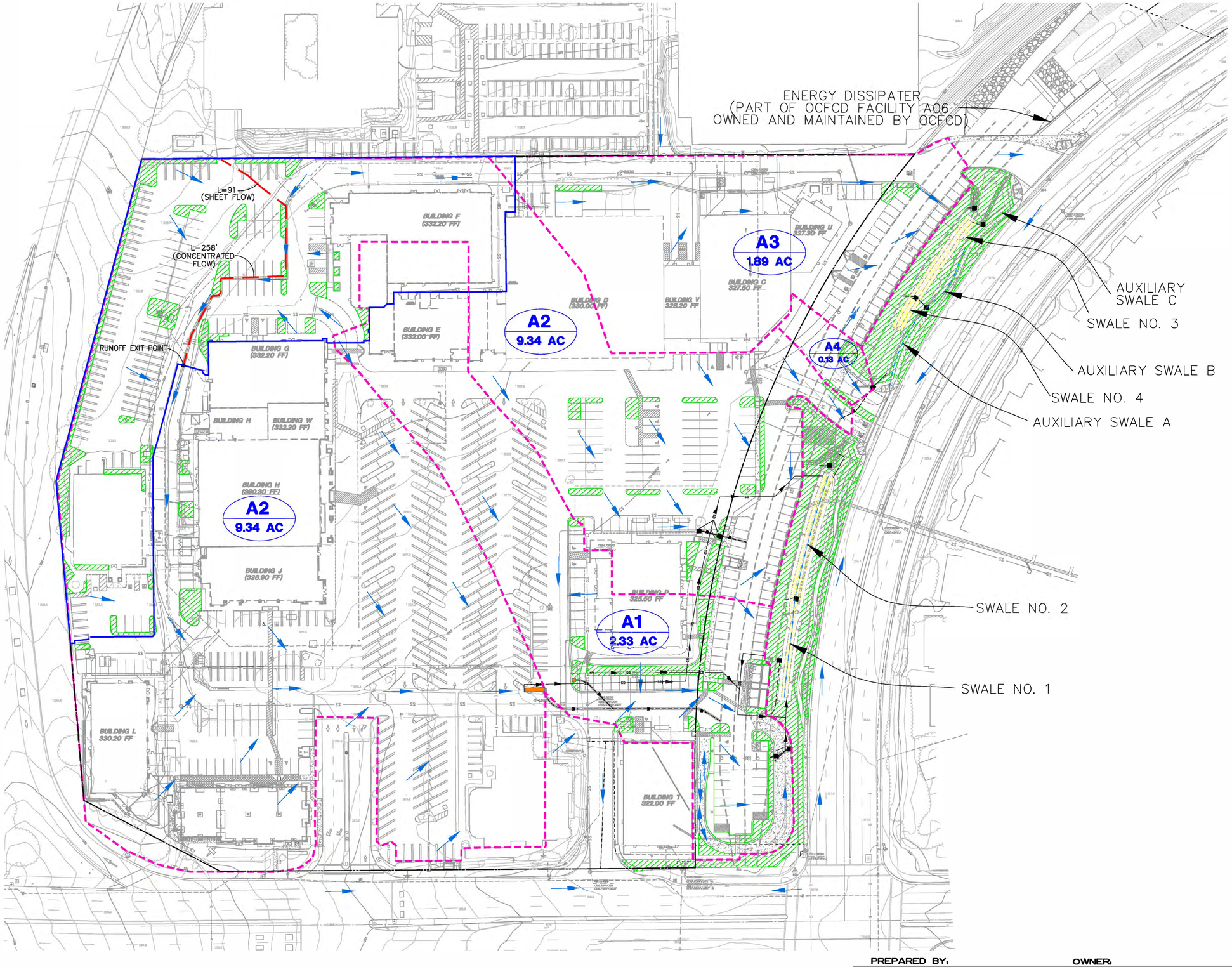
WATER QUALITY MANAGEMENT PLAN
BMP EXHIBIT (SITE PLAN)
BREA PLAZA
1639 E. IMPERIAL HIGHWAY, BREA, CA
(PROJECT NO. PLN-2022-00078 & PLN-2024-00017)

SHEET 1 OF 1

\\CA-SVR1\Docs\487-3 BREA PLAZA APARTMENTS\WQMP\487-5 WQMP Site Plan.dwg Last Modified: 09 Jan 2025 - 2:15pm
Plotted on: 19 Feb 2025 - 3:53pm by cward

EXISTING WQMP DRAINAGE AREAS EXHIBIT

(OVERALL SITE)



PROJECT DATA:

EXISTING SITE DRAINAGE AREAS (TOTAL): 13.69 AC (596,336 SF)

PROPOSED PROJECT AREA: 2.59 AC (112,817 SF)
EXISTING IMPERVIOUS AREA: 91.2% (102,833 SF)
EXISTING PERVIOUS AREA: 8.8% (9,984 SF)

CURRENT USE: COMMERCIAL

WATERSHED:
SAN GABRIEL–COYOTE CREEK WATERSHED

LEGEND — STRUCTURAL / TREATMENT BMPS

- LANDSCAPE AREA EFFICIENT IRRIGATION
  LANDSCAPE AREA RUNOFF–MINIMIZING DESIGN
- CATCH BASIN / STORM DRAIN INLET
- FLOW PATTERN
- EXISTING DRAINAGE AREAS A1
- PROPOSED PROJECT AREA
- VEGETATED SWALE
- SD — LOW FLOW STORM DRAIN
- HIGH FLOW STORM DRAIN
- FLOW PATH

NORTH

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

PREPARED BY:

CA ENGINEERING, INC.
Planning • Engineering • Surveying
4101 BIRCH STREET
NEWPORT BEACH, CA, 92660
949-724-9480 949-724-9484 FAX

OWNER:

BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
CONTACT: WAAD J. NADHIR
TELEPHONE: (248) 792-5071

CITY OF BREA
WATER QUALITY MANAGEMENT PLAN
EXISTING WQMP DRAINAGE AREAS
BREA PLAZA
IMPERIAL HIGHWAY

SHEET 1 OF 1

OLDCASTLE FLOGARD +PLUS CATCH BASIN INSERT FILTER SPECIFICATIONS AND INSPECTION AND MAINTENANCE GUIDE

Oldcastle Infrastructure™
A CRH COMPANY

PUT A STOP to TSS

Removes Pollutants from Runoff Prior to Entering Waterways

Efficient System
Catches pollutants where they are easiest to catch, at the inlet.

Variable Design
Able to be retrofitted or used in new projects.

Treatment Train
Can be incorporated as part of a "Treatment Train".

No Standing Water
Helps to minimize bacteria and odor problems.

Focused Treatment
Removes petroleum hydrocarbons, trash and Total Suspended Solids (TSS).

Maximum Flexibility
Available in a variety of standard sizes to fit round and square inlets.

Economical
Earn a higher return on system investment.

Two-part stainless-steel insert to filter solids and oils/grease.

Easy to install, inspect and maintain, even on small and confined sites.

By the Numbers*:
Filter will remove up to 80% of Total Suspended Solids (TSS), at least 70% of oils and grease, and up to 40% of Total Phosphorus (TP) associated with organic debris as well as Polycyclic Aromatic Hydrocarbons (PAH) from oil leaks and spills.

*Approximate for urban street application.

CATCH BASIN FILTER TEST RESULTS SUMMARY			
Testing Agency	% TSS Removal	% Oil & Grease Removal	% PAH Removal
UCLA	80	70 to 80	
U of Auckland Tonking & Taylor, Ltd (for City of Auckland)	78 to 95		
U of Hawaii (for City of Honolulu)	80		20 to 40

Oldcastle Infrastructure™
A CRH COMPANY

PUT A STOP
to TSS

Multi-Purpose Catch Basin Insert Retains Sediment, Debris, Trash and Oils/Grease

FloGard® catch basin insert filters are recommended for areas subject to silt and debris as well as low-to-moderate levels of petroleum hydrocarbons (oils and grease). Examples of such areas include vehicle parking lots, aircraft ramps, truck and bus storage yards, business parks, residential and public streets.

CATCH BASIN FILTER COMPETITIVE FEATURE COMPARISON		
Evaluation of Catch Basin Filters (Based on flow-comparable units) (Scale 1-10)	Oldcastle	Other Insert Filter Types**
Flow Rate	10	7
Removal Efficiency*	80%	45%
Capacity - Sludge & Oil	7	7
Service Life	10	3
Installation - Ease of Handling / Installation	8	6
Ease of Inspections & Maintenance	7	7
Value	10	2

*Approximate, based on field sediment removal testing in urban street application **Average

Long-Term Value Comparison (Based on flow-comparable units) (Scale 1-10)	Oldcastle	Other Insert Filter Types**
Unit Value - Initial ($/cfs treated)	10	4
Installation Value ($/cfs treated)	10	7
Absorbent Replacement (annual avg ($/cfs treated)	10	2
Materials Replacement Value (annual avg ($/cfs treated)	10	10
Maintenance Value (annual avg ($/cfs treated)	10	7
Total First Year ROI ($/cfs treated)	10	5
Total Annual Avg Value ($/cfs treated, avg over 20 yrs)*	10	5

Captured debris from FloGard catch basin insert filter in Dana Point, California.

Combination Inlet

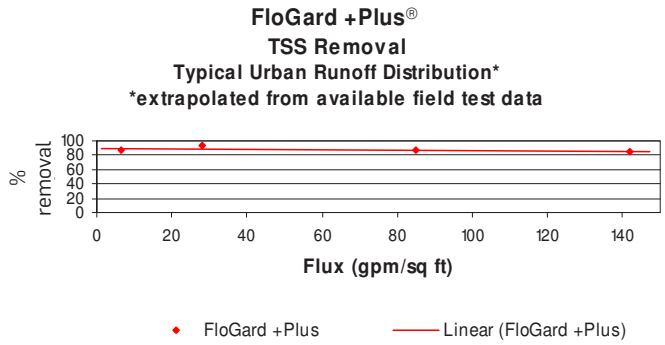
Flat-Grated Inlet

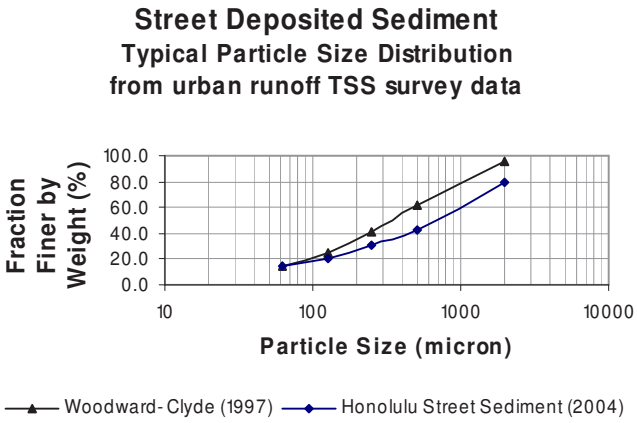
Circular Frame Inlet

(800) 579-8819
oldcastleinfrastructure.com

FLOGARD +PLUS®

Independent field tests conducted in Hawaii and New Zealand on FloGard +PLUS® Catch Basin Insert Filters to determine removal efficiency of Total Suspended Solids (TSS). Results were extrapolated to a typical street deposited sediment particle size. Removal efficiencies were plotted and reflect effective TSS removal over a typical range of operating flow rates. Results are shown below as a function of unit internal surface area.





FloGard +PLUS® Catch Basin Insert Filter is an efficient inlet prefilter designed to remove suspended sediment and floatable trash and hydrocarbons from stormwater runoff in new or retrofit applications. It is ideally suited for removal of primary pollutants from paved surfaces in commercial and residential areas, or may form part of a treatment train. The device features a unique dual-bypass design, durable components, flexible installation options and easy maintenance access.

Units are sized to fit most common styles of drainage inlet grate frames or inlet widths. Rated filtered flow capacities for each model typically exceed the required "first flush" treatment flow rate, and account for reduction in capacity as the unit accumulates suspended pollutants. Rated bypass capacity for each model also typically exceeds the inlet capacity of the catch basin.

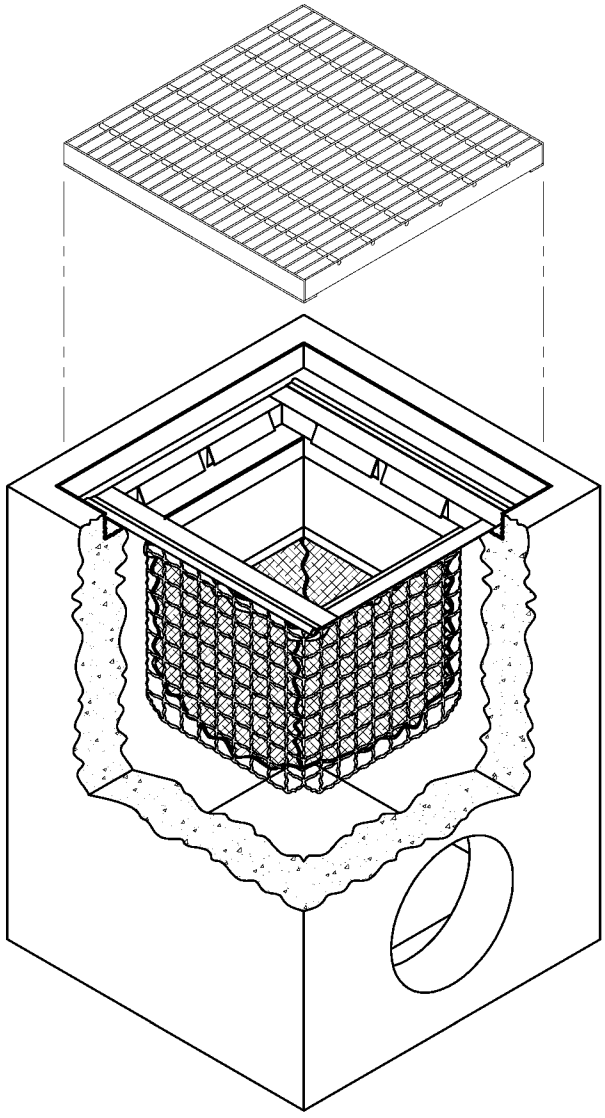
FloGard +PLUS® Test Results Summary

Testing Agency	%TSS Removal	% Oil & Grease Removal
UCLA	80*	70-80
U of Auckland Tonkin & Taylor LTD (City of Auckland)	95** 78-86***	
U of Hawaii (City of Honolulu)	80***	

*Sand larger than ~ 575 µm
**Sand distribution ~ 100-1000 µm
***Local street sweep material (distribution consistent with NURP)

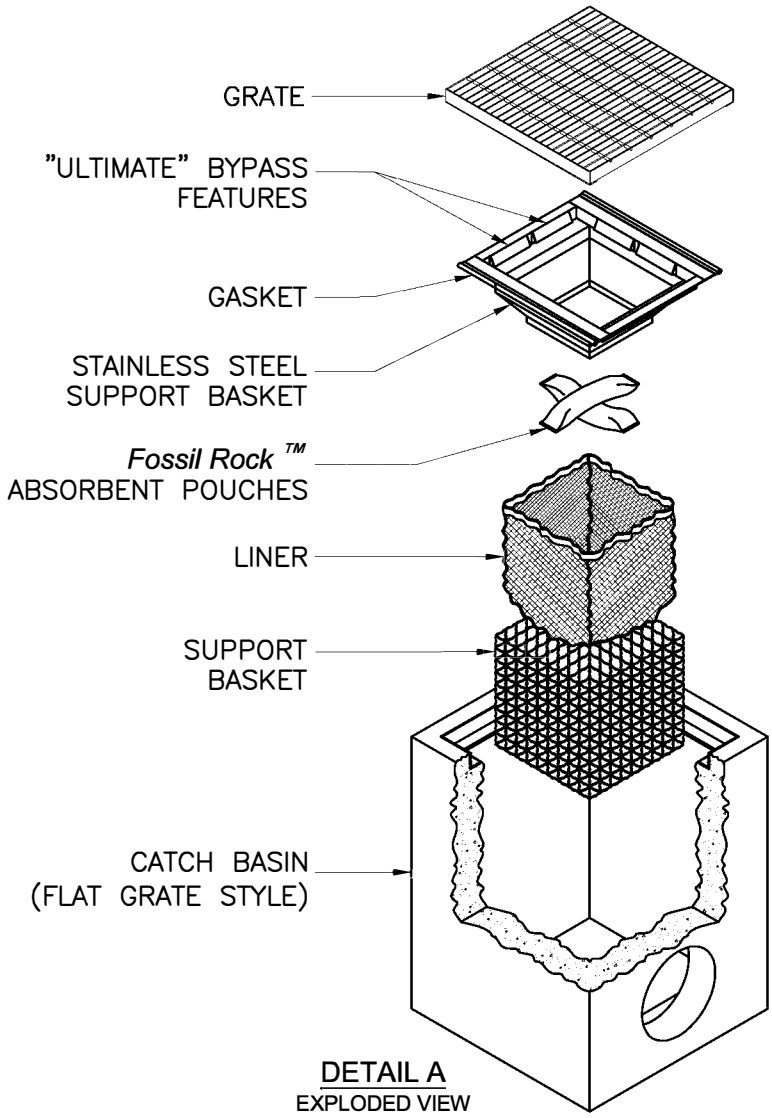
See product specifications for standard model details.

FGP-0001



FloGard® FILTER

-INSTALLED INTO CATCH BASIN-



DETAIL A

EXPLODED VIEW

NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be *Fossil Rock* ™, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

U.S. PATENT # 6,00,023 & 6,877,029

Inlet Filtration

FloGard®

Catch Basin Insert Filter

Grated Inlet Style

Oldcastle® Stormwater Solutions

7921 Southpark Plaza, Suite 200 | Littleton, CO | 80120 | Ph: 800.579.8819 | oldcastlestormwater.com

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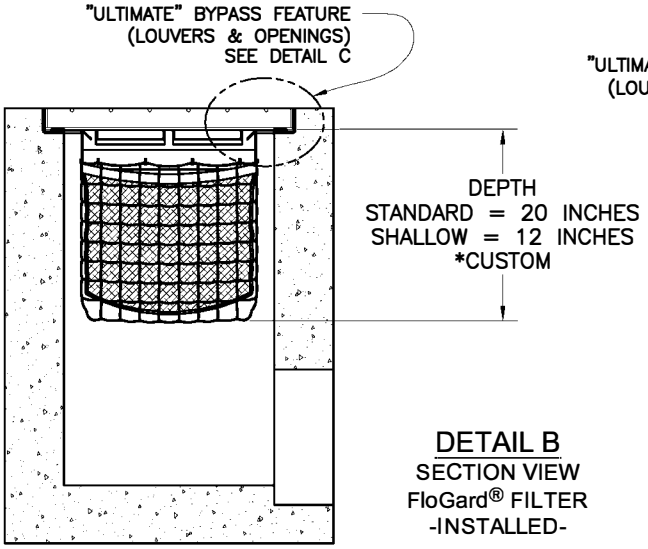
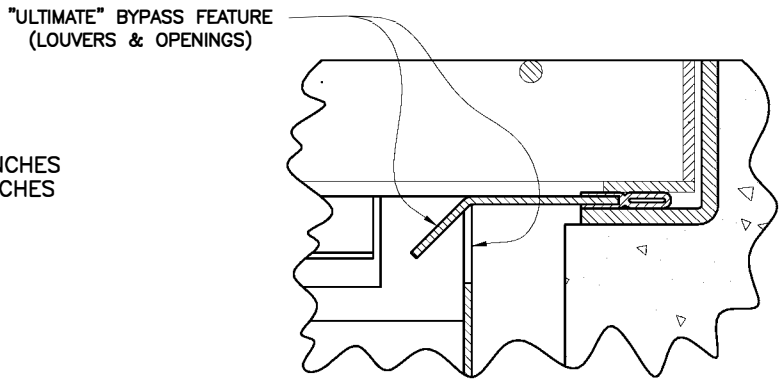
FGP-0001	G	ECO–0142 JPR 7/13/16	JPR 11/3/06	SHEET 1 OF 2

U.S. PATENT # 6,00,023 & 6,877,029



DETAIL B
SECTION VIEW
FloGard® FILTER
-INSTALLED-



DETAIL C
"ULTIMATE"
BYPASS FEATURES

* MANY OTHER STANDARD & CUSTOM SIZES & DEPTHS AVAILABLE UPON REQUEST.

SPECIFIER CHART

MODEL NO. STANDARD DEPTH	STANDARD & SHALLOW DEPTH (Data in these columes is the same for both STANDARD & SHALLOW versions)			STANDARD DEPTH -20 Inches-		MODEL NO. SHALLOW DEPTH	SHALLOW DEPTH -12 Inches-	
	INLET ID Inside Dimension (inch x inch)	GRATE OD Outside Dimension (inch x inch)	TOTAL BYPASS CAPACITY (cu. ft. / sec.)	SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)		SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)
FGP-12F	12 X 12	12 X 14	2.8	0.3	0.4	FGP-12F8	.15	.25
FGP-16F	16 X 16	16 X 19	4.7	0.8	0.7	FGP-16F8	.45	.4
FGP-18F	18 X 18	18 X 20	4.7	0.8	0.7	FGP-18F8	.45	.4
FGP-1824F	16 X 22	18 X 24	5.0	1.5	1.2	FGP-1824F8	.85	.7
FGP-1836F	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836F8	1.3	.9
FGP-2024F	18 X 22	20 X 24	5.9	1.2	1.0	FGP-2024F8	.7	.55
FGP-21F	22 X 22	22 X 24	6.1	2.2	1.5	FGP-21F8	1.25	.85
FGP-24F	24 X 24	24 X 27	6.1	2.2	1.5	FGP-24F8	1.25	.85
FGP-2430F	24 X 30	26 X 30	7.0	2.8	1.8	FGP-2430F8	1.6	1.05
FGP-2436F	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8	1.95	1.15
FGP-2448F	24 X 48	26 X 48	9.3	4.4	2.4	FGP-2448F8	2.5	1.35
FGP-28F	28 X 28	32 X 32	6.3	2.2	1.5	FGP-28F8	1.25	.85
FGP-30F	30 X 30	30 X 34	8.1	3.6	2.0	FGP-30F8	2.05	1.15
FGP-36F	36 X 36	36 X 40	9.1	4.6	2.4	FGP-36F8	2.65	1.35
FGP-3648F	36 X 48	40 X 48	11.5	6.8	3.2	FGP-3648F8	3.9	1.85
FGP-48F	48 X 48	48 X 54	13.2	9.5	3.9	FGP-48F8	5.45	2.25
FGP-SD24F	24 X 24	28 X 28	6.1	2.2	1.5	FGP-SD24F8	1.25	.85

FloGard®

Catch Basin Insert Filter

Grated Inlet Style

Oldcastle® Stormwater Solutions
7921 Southpark Plaza, Suite 200 | Littleton, CO | 80120 | Ph: 800.579.8819 | oldcastlestormwater.com

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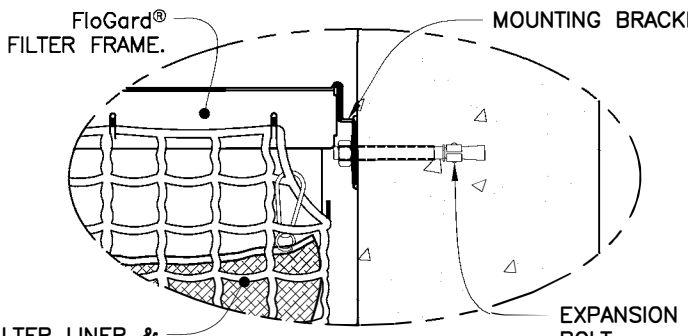
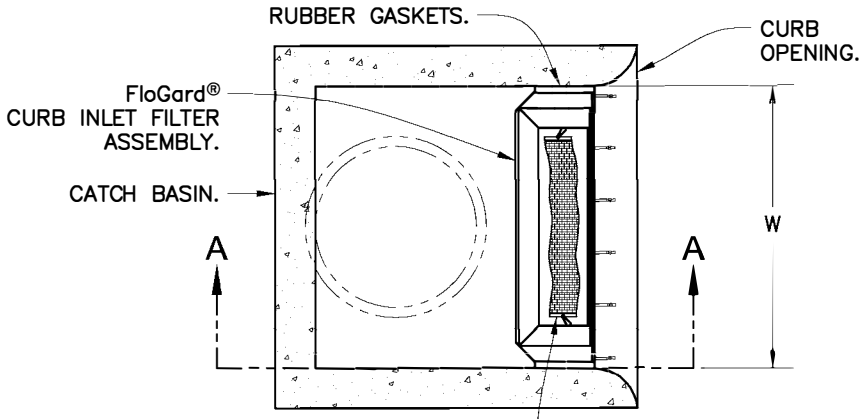
FGP-0001	G	ECO-0142 JPR 7/13/16	JPR 11/3/06	SHEET 2 OF 2

FGP-0002

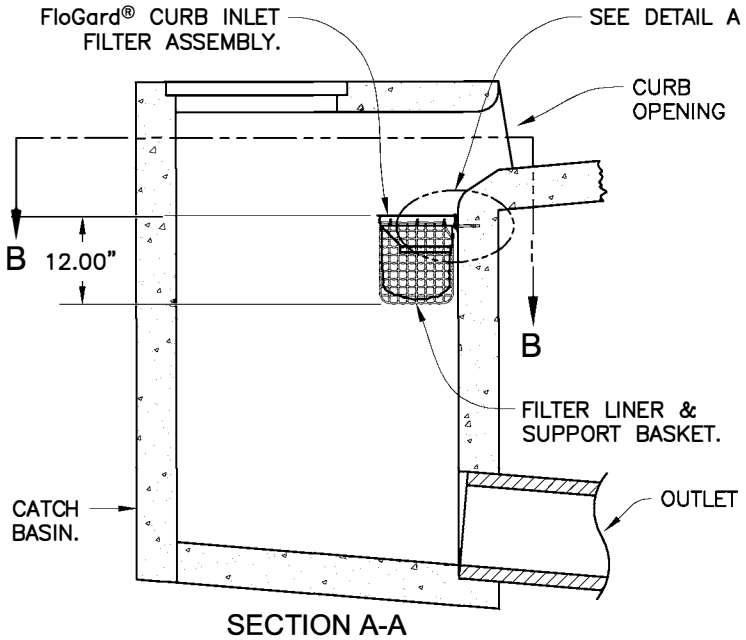


DETAIL A
MOUNTING BRACKET & EXPANSION BOLTS
SEE NOTE 2
SCALE: 6X



SECTION B-B
TOP VIEW
SCALE: 1X

SPECIFIER CHART				
MODEL NO.	Curb Opening Width - W -	Storage Capacity - Cu. Ft. -	Filtered Flow Rate - GPM/CFS -	Bypass Flow Rate - GPM/CFS -
FGP-24CI	2.0' (24")	.95	338 / .75	2,513 / 5.6
FGP-30CI	2.5' (30")	1.20	450 / 1.00	3,008 / 6.7
FGP-36CI	3.0' (36")	1.50	563 / 1.25	3,547 / 7.9
FGP-42CI	3.5' (42")	1.80	675 / 1.50	3,951 / 8.8
FGP-48CI	4.0' (48")	2.10	768 / 1.76	4,445 / 9.9
FGP-5.0CI	5.0' (60")	2.40	900 / 2.00	5,208 / 11.6
FGP-6.0CI	6.0' (72")	3.05	1,126 / 2.51	6,196 / 13.8
FGP-7.0CI	7.0' (84")	3.65	1,350 / 3.01	7,139 / 15.9
FGP-8.0CI	8.0' (96")	4.25	1,576 / 3.51	8,082 / 18.0
FGP-10.0CI	10.0' (120")	4.85	1,800 / 4.01	9,833 / 21.9
FGP-12.0CI	12.0' (144")	6.10	2,252 / 5.02	11,764 / 26.2
FGP-14.0CI	14.0' (168")	7.30	2,700 / 6.02	13,515 / 30.1
FGP-16.0CI	16.0' (192")	8.55	3.152 / 7.02	15,446 / 34.4
FGP-18.0CI	18.0' (216")	9.45	3,490 / 7.78	17,152 / 38.2
FGP-21.0CI	21.0' (252")	10.95	4,050 / 9.02	19,891 / 44.3
FGP-28.0CI	28.0 (336")	14.60	5,400 / 12.03	26,311 / 58.6



SECTION A-A
SIDE VIEW
SCALE: 1X

NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be *Fossil Rock ™*, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

Inlet
Filtration

FloGard®

Catch Basin Insert Filter

Curb Inlet Style

Oldcastle®
Stormwater Solutions

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Oldcastle Infrastructure™
A CRH COMPANY

FLOGARD+PLUS®
CATCH BASIN INSERT FILTER

Inspection and Maintenance Guide

DRAINAGE PROTECTION SYSTEMS
DPS
A division of
Oldcastle Infrastructure

Water

SCOPE:

Federal, State and Local Clean Water Act regulations and those of insurance carriers require that stormwater filtration systems be maintained and serviced on a recurring basis. The intent of the regulations is to ensure that the systems, on a continuing basis, efficiently remove pollutants from stormwater runoff thereby preventing pollution of the nation's water resources. These specifications apply to the FloGard+Plus® Catch Basin Insert Filter.

RECOMMENDED FREQUENCY OF SERVICE:

Drainage Protection Systems (DPS) recommends that installed FloGard+Plus Catch Basin Insert Filters be serviced on a recurring basis. Ultimately, the frequency depends on the amount of runoff, pollutant loading and interference from debris (leaves, vegetation, cans, paper, etc.); however, it is recommended that each installation be serviced a minimum of three times per year, with a change of filter medium once per year. DPS technicians are available to do an on-site evaluation, upon request.

RECOMMENDED TIMING OF SERVICE:

DPS guidelines for the timing of service are as follows:

1. For areas with a definite rainy season: Prior to, during and following the rainy season.
2. For areas subject to year-round rainfall: On a recurring basis (at least three times per year).
3. For areas with winter snow and summer rain: Prior to and just after the snow season and during the summer rain season.
4. For installed devices not subject to the elements (wash racks, parking garages, etc.): On a recurring basis (no less than three times per year).

SERVICE PROCEDURES:

1. The catch basin grate shall be removed and set to one side. The catch basin shall be visually inspected for defects and possible illegal dumping. If illegal dumping has occurred, the proper authorities and property owner representative shall be notified as soon as practicable.
2. Using an industrial vacuum, the collected materials shall be removed from the liner. (Note: DPS uses a truck-mounted vacuum for servicing FloGard+Plus catch basin inserts).
3. When all of the collected materials have been removed, the filter medium pouches shall be removed by unsnapping the tether from the D-ring and set to one side. The filter liner, gaskets, stainless steel frame and mounting brackets, etc., shall be inspected for continued serviceability. Minor damage or defects found shall be corrected on-the-spot and a notation made on the Maintenance Record. More extensive deficiencies that affect the efficiency of the filter (torn liner, etc.), if approved by the customer representative, will be corrected and an invoice submitted to the representative along with the Maintenance Record.
4. The filter medium pouches shall be inspected for defects and continued serviceability and replaced as necessary, and the pouch tethers re-attached to the liner's D-ring.
5. The grate shall be replaced.

REPLACEMENT AND DISPOSAL OF EXPOSED FILTER MEDIUM AND COLLECTED DEBRIS

The frequency of filter medium exchange will be in accordance with the existing DPS-Customer Maintenance Contract. DPS recommends that the medium be changed at least once per year. During the appropriate service, or if so determined by the service technician during a non-scheduled service, the filter medium will be replaced with new material. Once the exposed pouches and debris have been removed, DPS has possession and must dispose of it in accordance with local, state and federal agency requirements.

DPS also has the capability of servicing all manner of storm drain filters, catch basin inserts and catch basins without inserts, underground oil/water separators, stormwater interceptors and other such devices. All DPS personnel are highly qualified technicians and are confined-space trained and certified. Call us at (888) 950-8826 for further information and assistance.

FLOGARD+PLUS®
CATCH BASIN INSERT FILTER

OUR MARKETS

BUILDING STRUCTURES

COMMUNICATIONS

WATER

ENERGY

TRANSPORTATION

BMP FACT SHEET—

BIO-7: PROPRIETARY BIOTREATMENT

BIO-7: Proprietary Biotreatment

Proprietary biotreatment devices are devices that are manufactured to mimic natural systems such as bioretention areas by incorporating plants, soil, and microbes engineered to provide treatment at higher flow rates or volumes and with smaller footprints than their natural counterparts. Incoming flows are typically filtered through a planting media (mulch, compost, soil, plants, microbes, etc.) and either infiltrated or collected by an underdrain and delivered to the storm water conveyance system. Tree box filters are an increasingly common type of proprietary biotreatment device that are installed at curb level and filled with a bioretention type soil. For low to moderate flows they operate similarly to bioretention systems and are bypassed during high flows. Tree box filters are highly adaptable solutions that can be used in all types of development and in all types of soils but are especially applicable to dense urban parking lots, street, and roadways.

Also known as:

- *Catch basin planter box*
- *Bioretention vault*
- *Tree box filter*

Proprietary biotreatment
Source:
http://www.americastusa.com/index.php/filterra/

Feasibility Screening Considerations

- Proprietary biotreatment devices that are unlined may cause incidental infiltration. Therefore, an evaluation of site conditions should be conducted to evaluate whether the BMP should include an impermeable liner to avoid infiltration into the subsurface.

Opportunity Criteria

- Drainage areas of 0.25 to 1.0 acres.
- Land use may include commercial, residential, mixed use, institutional, and subdivisions. Proprietary biotreatment facilities may also be applied in parking lot islands, traffic circles, road shoulders, and road medians.
- Must not adversely affect the level of flood protection provided by the drainage system.

OC-Specific Design Criteria and Considerations

☐ Frequent maintenance and the use of screens and grates to keep trash out may decrease the likelihood of clogging and prevent obstruction and bypass of incoming flows.

☐ Consult proprietors for specific criteria concerning the design and performance.

☐ Proprietary biotreatment may include specific media to address pollutants of concern. However, for proprietary device to be considered a biotreatment device the media must be capable of supporting rigorous growth of vegetation.

☐ Proprietary systems must be acceptable to the reviewing agency. Reviewing agencies shall have the discretion to request performance information. Reviewing agencies shall have the discretion to deny the use of a proprietary BMP on the grounds of performance, maintenance considerations, or other relevant factors.

☐ In right of way areas, plant selection should not impair traffic lines of site. Local jurisdictions may also limit plant selection in keeping with landscaping themes.

Computing Sizing Criteria for Proprietary Biotreatment Device

- Proprietary biotreatment devices can be volume based or flow-based BMPs.
- Volume-based proprietary devices should be sized using the Simple Design Capture Volume Sizing Method described in **Appendix III.3.1** or the Capture Efficiency Method for Volume-Based, Constant Drawdown BMPs described in **Appendix III.3.2**.
- The required design flowrate for flow-based proprietary devices should be computed using the Capture Efficiency Method for Flow-based BMPs described in **Appendix III.3.3)**.

In South Orange County, the provided ponding plus pore volume must be checked to demonstrate that it is greater than 0.75 of the remaining DCV that this BMP is designed to address. Many propretary biotreatment BMPs will not be able to meet the definition of "biofiltration" that applies in South Orange County. See Section III.7 and Worksheet SOC-1.

Additional References for Design Guidance

- Los Angeles Unified School District (LAUSD) Stormwater Technical Manual, Chapter 4: http://www.laschools.org/employee/design/fs-studies-and-reports/download/white_paper_report_material/Storm_Water_Technical_Manual_2009-opt-red.pdf?version_id=76975850
- Los Angeles County Stormwater BMP Design and Maintenance Manual, Chapter 9: http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf
- Santa Barbara BMP Guidance Manual, Chapter 6: http://www.santabarbaraca.gov/NR/rdonlyres/91D1FA75-C185-491E-A882-49EE17789DF8/0/Manual_071008_Final.pdf

MODULAR WETLANDS SYSTEM STORMWATER BIOFILTRATION GUIDE

(SPECIFICATIONS AND SIZING OPTIONS) /

MWS LINEAR 2.0 HGL SIZING CALCULATIONS TABLE

Bio Clean

A Forterra Company

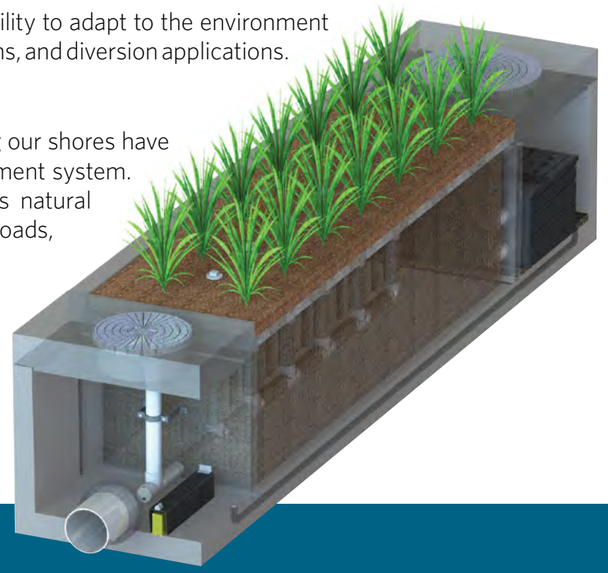
Modular Wetlands® System Linear

A Stormwater Biofiltration Solution

OVERVIEW

The Bio Clean Modular Wetlands® System Linear (MWS Linear) represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint, higher treatment capacity, and a wide range of versatility. While most biofilters use little or no pretreatment, the Modular Wetlands System Linear incorporates an advanced pretreatment chamber that includes separation and pre-filter cartridges. In this chamber, sediment and hydrocarbons are removed from runoff before entering the biofiltration chamber, reducing maintenance costs and improving performance.

Horizontal flow also gives the system the unique ability to adapt to the environment through a variety of configurations, bypass orientations, and diversion applications.



The Urban Impact

For hundreds of years, natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as cities grow and develop, our environment's natural filtration systems are blanketed with impervious roads, rooftops, and parking lots.

Bio Clean understands this loss and has spent years re-establishing nature's presence in urban areas, and rejuvenating waterways with the MWS Linear.

PERFORMANCE

The Modular Wetlands® System Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons, and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country and is proven to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. In fact, the MWS Linear harnesses some of the same biological processes found in natural wetlands in order to collect, transform, and remove even the most harmful pollutants.

66% REMOVAL OF DISSOLVED ZINC	**69%** REMOVAL OF TOTAL ZINC	**38%** REMOVAL OF DISSOLVED COPPER	**64%** REMOVAL OF TOTAL PHOSPHORUS	
45% REMOVAL OF NITROGEN	**50%** REMOVAL OF TOTAL COPPER	**95%** REMOVAL OF MOTOR OIL	**67%** REMOVAL OF ORTHO PHOSPHORUS	**85%** REMOVAL OF TSS

APPROVALS

The Modular Wetlands® System Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation and perhaps the world. Here is a list of some of the most high-profile approvals, certifications, and verifications from around the country.

Washington State Department of Ecology TAPE Approved

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft^2 loading rate. The highest performing BMP on the market for all main pollutant categories.

California Water Resources Control Board, Full Capture Certification

The Modular Wetlands® System is the first biofiltration system to receive certification as a full capture trash treatment control device.

Virginia Department of Environmental Quality, Assignment

The Virginia Department of Environmental Quality assigned the MWS Linear the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) regulation technical criteria.

Maryland Department of the Environment, Approved ESD

Granted Environmental Site Design (ESD) status for new construction, redevelopment, and retrofitting when designed in accordance with the design manual.

MASTEP Evaluation

The University of Massachusetts at Amherst – Water Resources Research Center issued a technical evaluation report noting removal rates up to 84% TSS, 70% total phosphorus, 68.5% total zinc, and more.

Rhode Island Department of Environmental Management, Approved BMP

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% pathogens, 30% total phosphorus, and 30% total nitrogen.

Texas Commission on Environmental Quality

Atlanta Regional Commission

ADVANTAGES

- HORIZONTAL FLOW BIOFILTRATION
- GREATER FILTER SURFACE AREA
- PRETREATMENT CHAMBER
- PATENTED PERIMETER VOID AREA
- FLOW CONTROL
- NO DEPRESSED PLANTER AREA
- AUTO DRAINDOWN MEANS NO MOSQUITO VECTOR

OPERATION

The Modular Wetlands® System Linear is the most efficient and versatile biofiltration system on the market, and it is the only system with horizontal flow which:

- Improves performance
- Reduces footprint
- Minimizes maintenance

Figure 1 & Figure 2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

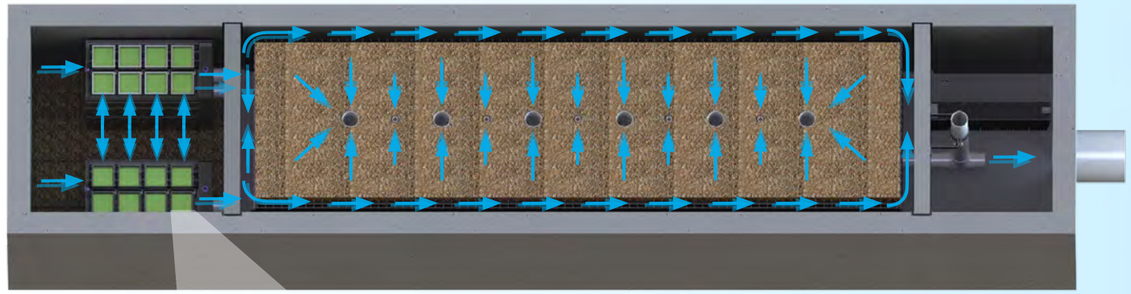


Figure 2,
Top View

2x to 3x more surface area than traditional downward flow bioretention systems.

1 PRETREATMENT

SEPARATION

- Trash, sediment, and debris are separated before entering the pre-filter boxes
- Designed for easy maintenance access

PRE-FILTER BOXES

- Over 25 sq. ft. of surface area per box
- Utilizes BioMediaGREEN™ filter material
- Removes over 80% of TSS and 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber

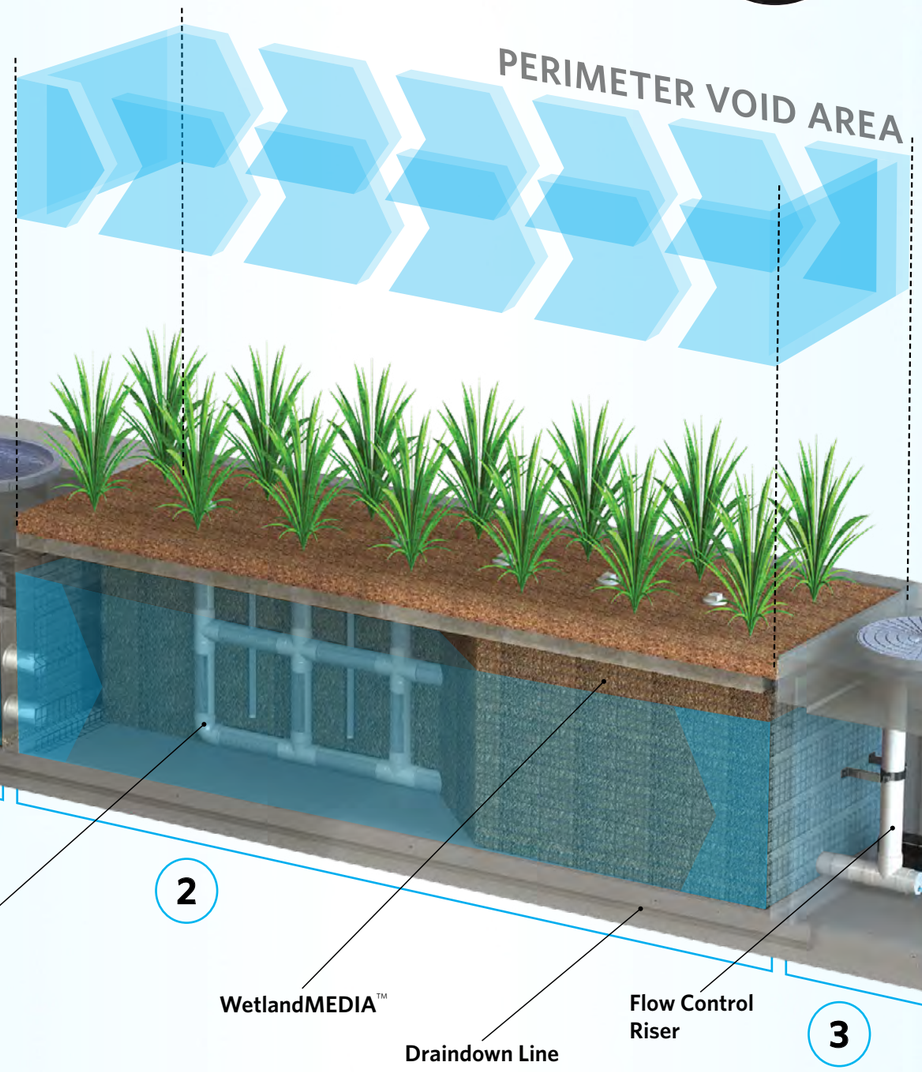


Figure 1

2 BIOFILTRATION

HORIZONTAL FLOW

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

PATENTED PERIMETER VOID AREA

- Vertically extends void area between the walls and the WetlandMEDIA™ on all four sides
- Maximizes surface area of the media for higher treatment capacity

WETLANDMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and lightweight

3 DISCHARGE

FLOW CONTROL

- Orifice plate controls flow of water through WetlandMEDIA™ to a level lower than the media's capacity
- Extends the life of the media and improves performance

DRAINDOWN FILTER

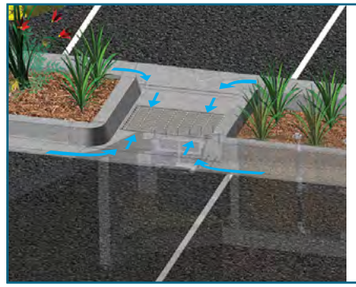
- The draindown is an optional feature that completely drains the pretreatment chamber
- Water that drains from the pretreatment chamber between storm events will be treated

CONFIGURATIONS

The Modular Wetlands® System Linear is the preferred biofiltration system of civil engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your storm drain design.

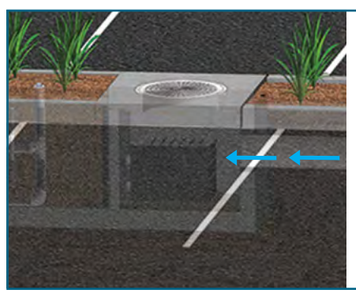
CURB TYPE

The Curb Type configuration accepts sheet flow through a curb opening and is commonly used along roadways and parking lots. It can be used in sump or flow-by conditions. Length of curb opening varies based on model and size.



GRATE TYPE

The Grate Type configuration offers the same features and benefits as the Curb Type but with a grated/drop inlet above the systems pretreatment chamber. It has the added benefit of allowing pedestrian access over the inlet. ADA-compliant grates are available to assure easy and safe access. The Grate Type can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



VAULT TYPE

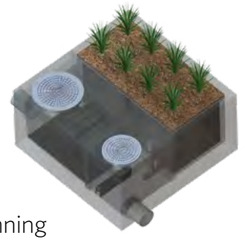
The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pretreatment chamber, meaning the Modular Wetlands® can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/ bioretention systems. Another benefit of the "pipe-in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.

DOWNSPOUT TYPE

The Downspout Type is a variation of the Vault Type and is designed to accept a vertical downspout pipe from rooftop and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter, and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

ORIENTATIONS

SIDE-BY-SIDE



The Side-By-Side orientation places the pretreatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.

END-TO-END

The End-To-End orientation places the pretreatment and discharge chambers on opposite ends of the biofiltration chamber, therefore minimizing the width of the system to 5 ft. (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is that bypass must be external.

BYPASS

INTERNAL BYPASS WEIR (SIDE-BY-SIDE ONLY)

The Side-By-Side orientation places the pretreatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pretreatment chamber directly to the discharge chamber.

EXTERNAL DIVERSION WEIR STRUCTURE

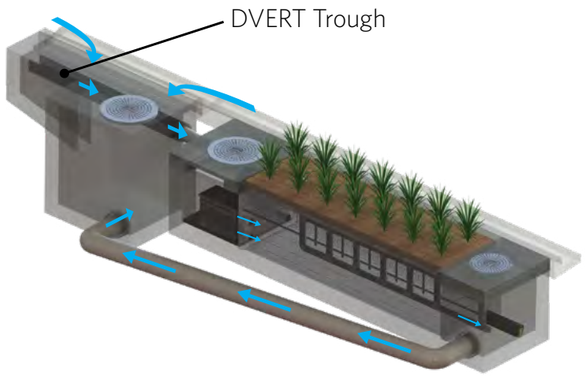
This traditional offline diversion method can be used with the Modular Wetlands® System Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

FLOW-BY-DESIGN

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT LOW FLOW DIVERSION

This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the Modular Wetlands® System Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels



them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allow the system to be installed anywhere space is available.

SPECIFICATIONS

FLOW-BASED DESIGNS

The Modular Wetlands® System Linear can be used in stand-alone applications to meet treatment flow requirements, and since it is the only biofiltration system that can accept inflow pipes several feet below the surface, it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

MODEL #	DIMENSIONS	WETLANDMEDIA SURFACE AREA (sq. ft.)	TREATMENT FLOW RATE (cfs)
MWS-L-4-4	4′ x 4′	23	0.052
MWS-L-4-6	4′ x 6′	32	0.073
MWS-L-4-8	4′ x 8′	50	0.115
MWS-L-4-13	4′ x 13′	63	0.144
MWS-L-4-15	4′ x 15′	76	0.175
MWS-L-4-17	4′ x 17′	90	0.206
MWS-L-4-19	4′ x 19′	103	0.237
MWS-L-4-21	4′ x 21′	117	0.268
MWS-L-6-8	7′ x 9′	64	0.147
MWS-L-8-8	8′ x 8′	100	0.230
MWS-L-8-12	8′ x 12′	151	0.346
MWS-L-8-16	8′ x 16′	201	0.462
MWS-L-8-20	9′ x 21′	252	0.577
MWS-L-8-24	9′ x 25′	302	0.693
MWS-L-10-20	10' x 20'	302	0.693

VOLUME-BASED DESIGNS

HORIZONTAL FLOW BIOFILTRATION ADVANTAGE

MODULAR WETLANDS® SYSTEM LINEAR WITH URBANPOND™ PRESTORAGE

In the example above, the Modular Wetlands® System Linear is installed downstream of the UrbanPond storage system. The MWS Linear is designed for the water quality volume and will treat and discharge the required volume within local draindown time requirements. The MWS Linear's unique horizontal flow design, gives it benefits no other biofilter has - the ability to be placed downstream of detention ponds, extended dry detention basins, underground storage systems and permeable paver reservoirs. The system's horizontal flow configuration and built-in orifice control allows it to be installed with just 6" of fall between inlet and outlet pipe for a simple connection to projects with shallow downstream tie-in points.

UrbanPond
Single and Double Modules

DESIGN SUPPORT

Bio Clean engineers are trained to provide you with superior support for all volume sizing configurations throughout the country. Our vast knowledge of state and local regulations allow us to quickly and efficiently size a system to maximize feasibility. Volume control and hydromodification regulations are expanding the need to decrease the cost and size of your biofiltration system. Bio Clean will help you realize these cost savings with the MWS Linear, the only biofilter than can be used downstream of storage BMPs.

ADVANTAGES

- LOWER COST THAN FLOW-BASED DESIGN
- MEETS LID REQUIREMENTS
- BUILT-IN ORIFICE CONTROL STRUCTURE
- WORKS WITH DEEP INSTALLATIONS

APPLICATIONS

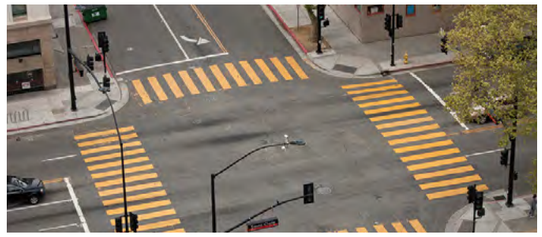
The Modular Wetlands® System Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.

INDUSTRIAL

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA-mandated effluent limits for dissolved metals and other pollutants.

RESIDENTIAL

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.



STREETS

Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and it offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.

PARKING LOTS

Parking lots are designed to maximize space and the Modular Wetlands'® 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.

COMMERCIAL

Compared to bioretention systems, the MWS Linear can treat far more area in less space, meeting treatment and volume control requirements.

MIXED USE

The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications include:

• Agriculture • Reuse • Low Impact Development • Waste Water

PLANT SELECTION

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the Modular Wetlands® System Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade, the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more contact time so that pollutants are more successfully decomposed, volatilized, and incorporated into the biomass of the Modular Wetlands'® micro/macro flora and fauna.

A wide range of plants are suitable for use in the Modular Wetlands®, but selections vary by location and climate. View suitable plants by visiting biocleanenvironmental.com/plants.

INSTALLATION

The Modular Wetlands® System Linear is simple, easy to install, and has a space-efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles precast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians is available to supervise installations and provide technical support.

MAINTENANCE

Reduce your maintenance costs, man hours, and materials with the Modular Wetlands® System Linear. Unlike other biofiltration systems that provide no pretreatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pretreatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pretreatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pretreatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter boxes is required for long-term operation, and there is absolutely no need to replace expensive biofiltration media.

Bio Clean
A Forterra Company

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855.566.3938
stormwater@forterrabp.com
biocleanenvironmental.com

01172020

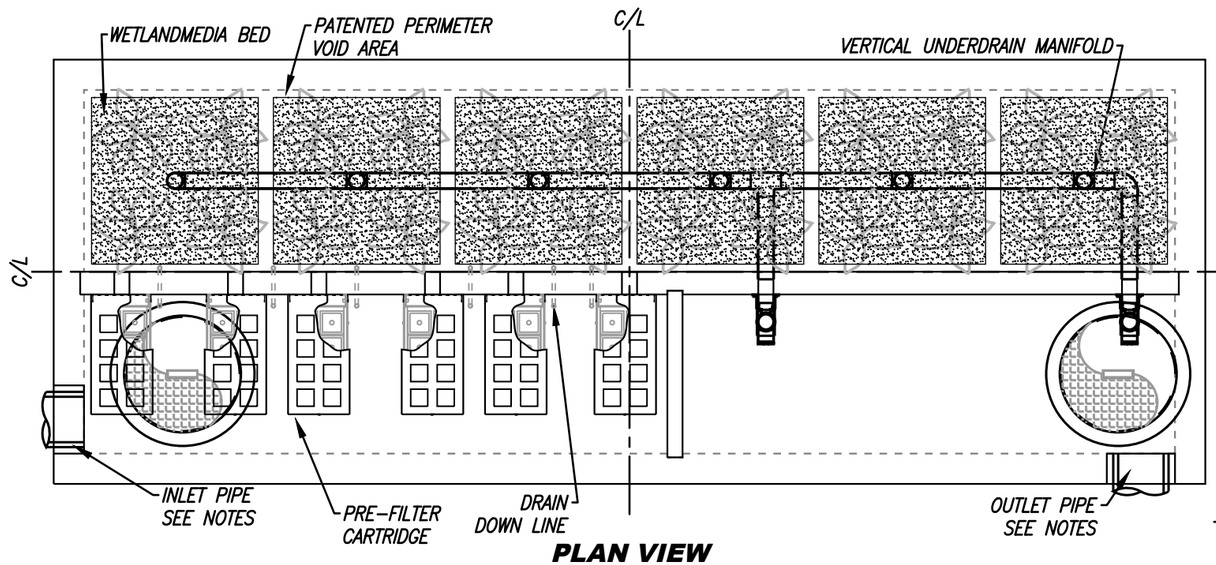
MWS Linear 2.0 HGL Sizing Calculations

MWS MODEL SIZE	WETLAND PERMITER LENGTH	LOADING RATE GPM/SF	HGL HEIGHT																												
			SHALLOW MODELS																			STANDARD HEIGHT MODEL	HIGH CAPACITY MODELS									
			1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.65	3.70	3.75	3.80	3.85	3.90	3.95
MWS-L-4-4	6.70	1.0	0.022	0.023	0.025	0.026	0.028	0.029	0.031	0.032	0.034	0.035	0.037	0.038	0.040	0.042	0.043	0.045	0.046	0.048	0.049	0.051	**0.052**	0.054	0.055	0.056	0.057	0.058	0.058	0.059	0.060	0.061
MWS-L-3-6	10.06	1.0	0.032	0.035	0.037	0.039	0.042	0.044	0.046	0.048	0.051	0.053	0.055	0.058	0.060	0.062	0.065	0.067	0.069	0.072	0.074	0.076	**0.078**	0.081	0.083	0.084	0.085	0.087	0.088	0.089	0.090	0.091
MWS-L-4-6	9.30	1.0	0.030	0.032	0.034	0.036	0.038	0.041	0.043	0.045	0.047	0.049	0.051	0.053	0.055	0.058	0.060	0.062	0.064	0.066	0.068	0.070	**0.073**	0.075	0.077	0.078	0.079	0.080	0.081	0.082	0.083	0.084
MWS-L-4-8	14.80	1.0	0.048	0.051	0.054	0.058	0.061	0.065	0.068	0.071	0.075	0.078	0.082	0.085	0.088	0.092	0.095	0.099	0.102	0.105	0.109	0.112	**0.115**	0.119	0.122	0.124	0.126	0.127	0.129	0.131	0.132	0.134
MWS-L-4-13	18.40	1.0	0.059	0.063	0.068	0.072	0.076	0.080	0.084	0.089	0.093	0.097	0.101	0.106	0.110	0.114	0.118	0.122	0.127	0.131	0.135	0.139	**0.144**	0.148	0.152	0.154	0.156	0.158	0.160	0.163	0.165	0.167
MWS-L-4-15	22.40	1.0	0.072	0.077	0.082	0.087	0.093	0.098	0.103	0.108	0.113	0.118	0.123	0.129	0.134	0.139	0.144	0.149	0.154	0.159	0.165	0.170	**0.175**	0.180	0.185	0.188	0.190	0.193	0.195	0.198	0.200	0.203
MWS-L-4-17	26.40	1.0	0.085	0.091	0.097	0.103	0.109	0.115	0.121	0.127	0.133	0.139	0.145	0.151	0.158	0.164	0.170	0.176	0.182	0.188	0.194	0.200	**0.206**	0.212	0.218	0.221	0.224	0.227	0.230	0.233	0.236	0.239
MWS-L-4-19	30.40	1.0	0.098	0.105	0.112	0.119	0.126	0.133	0.140	0.147	0.153	0.160	0.167	0.174	0.181	0.188	0.195	0.202	0.209	0.216	0.223	0.230	**0.237**	0.244	0.251	0.255	0.258	0.262	0.265	0.269	0.272	0.276
MWS-L-4-21	34.40	1.0	0.111	0.118	0.126	0.134	0.142	0.150	0.158	0.166	0.174	0.182	0.189	0.197	0.205	0.213	0.221	0.229	0.237	0.245	0.253	0.261	**0.268**	0.276	0.284	0.288	0.292	0.296	0.300	0.304	0.308	0.312
MWS-L-6-8	18.80	1.0	0.060	0.065	0.069	0.073	0.078	0.082	0.086	0.091	0.095	0.099	0.104	0.108	0.112	0.116	0.121	0.125	0.129	0.134	0.138	0.142	**0.147**	0.151	0.155	0.157	0.160	0.162	0.164	0.166	0.168	0.170
MWS-L-8-8	29.60	1.0	0.095	0.102	0.109	0.115	0.122	0.129	0.136	0.143	0.149	0.156	0.163	0.170	0.177	0.183	0.190	0.197	0.204	0.211	0.217	0.224	**0.231**	0.238	0.245	0.248	0.251	0.255	0.258	0.262	0.265	0.268
MWS-L-8-12	44.40	1.0	0.143	0.153	0.163	0.173	0.183	0.194	0.204	0.214	0.224	0.234	0.245	0.255	0.265	0.275	0.285	0.296	0.306	0.316	0.326	0.336	**0.346**	0.357	0.367	0.372	0.377	0.382	0.387	0.392	0.397	0.402
MWS-L-8-16	59.20	1.0	0.190	0.204	0.217	0.231	0.245	0.258	0.272	0.285	0.299	0.312	0.326	0.340	0.353	0.367	0.380	0.394	0.408	0.421	0.435	0.448	**0.462**	0.476	0.489	0.496	0.503	0.509	0.516	0.523	0.530	0.537
MWS-L-8-20	74.00	1.0	0.238	0.255	0.272	0.289	0.306	0.323	0.340	0.357	0.374	0.391	0.408	0.425	0.442	0.459	0.476	0.493	0.509	0.526	0.543	0.560	**0.577**	0.594	0.611	0.620	0.628	0.637	0.645	0.654	0.662	0.671
MWS-L-10-20 or MWS-L-8-24	88.80	1.0	0.285	0.306	0.326	0.346	0.367	0.387	0.408	0.428	0.448	0.469	0.489	0.509	0.530	0.550	0.571	0.591	0.611	0.632	0.652	0.673	**0.693**	0.713	0.734	0.744	0.754	0.764	0.774	0.785	0.795	0.805
4'x'4 media cage	14.80	1.0	0.048	0.051	0.054	0.058	0.061	0.065	0.068	0.071	0.075	0.078	0.082	0.085	0.088	0.092	0.095	0.099	0.102	0.105	0.109	0.112	**0.115**	0.119	0.122	0.124						

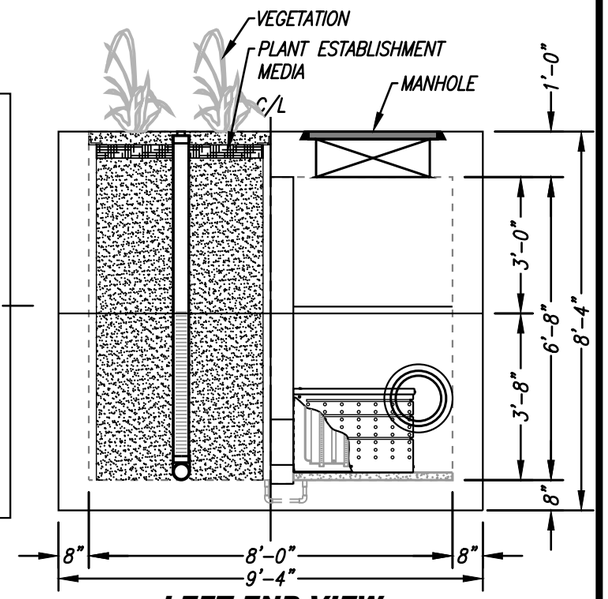
DETAILS FOR PROPOSED MODULAR WETLANDS SYSTEM UNITS

(MWS-L-8-24-7’-8”-V-HC MODEL & MWS-L-8-12-STANDARD HEIGHT MODEL)

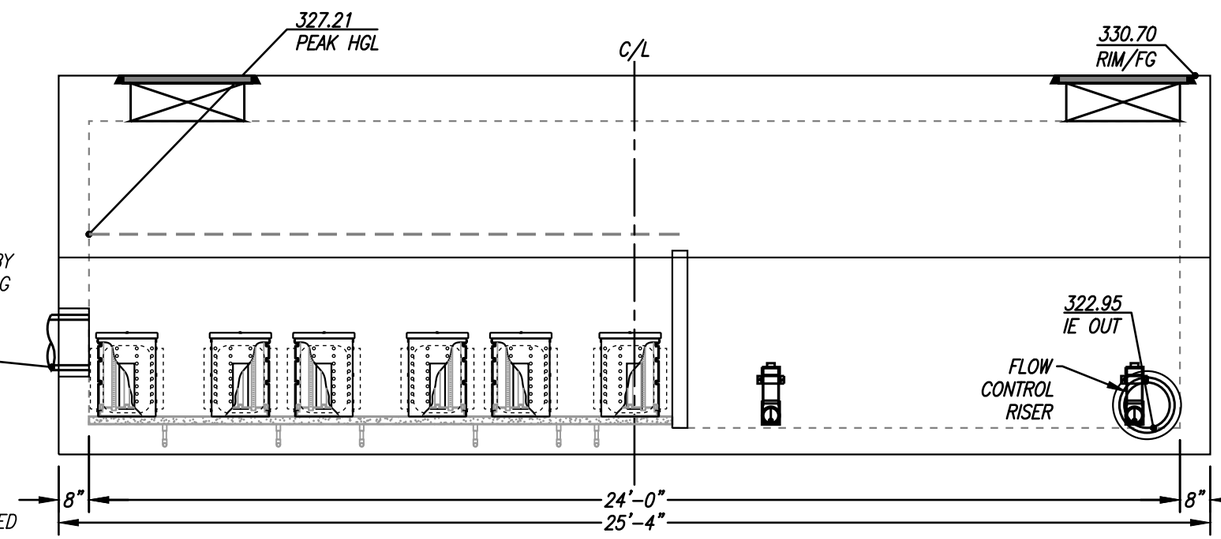
SITE SPECIFIC DATA			
PROJECT NUMBER		728257 – 010	
PROJECT NAME		BREA PLAZA	
PROJECT LOCATION		BREA, CA	
STRUCTURE ID		N/A	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.786	
TREATMENT HGL AVAILABLE (FT)			3.9
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			3.00
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	324.33	PVC	12"
OUTLET PIPE	322.95	PVC	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	330.70	330.70	330.70
SURFACE LOAD	PEDESTRIAN	N/A	PEDESTRIAN
FRAME & COVER	ø30"	OPEN PLANTER	ø30"
WETLANDMEDIA VOLUME (CY)			23.32
ORIFICE SIZE (DIA. INCHES)			ø2.74 EA
NOTES: PRELIMINARY NOT FOR CONSTRUCTION.			



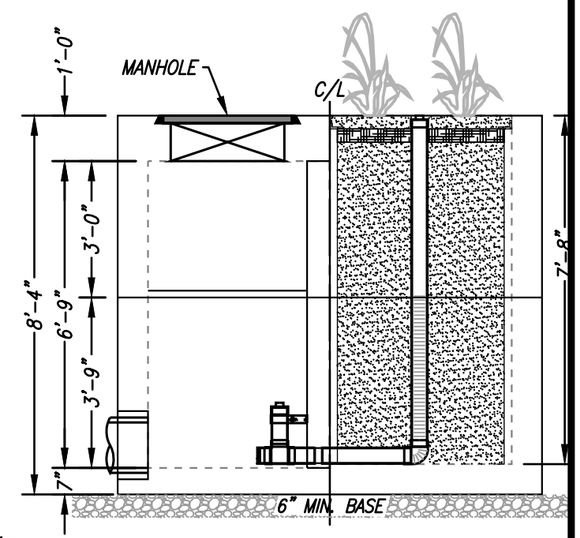
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

TREATMENT FLOW (CFS)	0.786
OPERATING HEAD (FT)	3.9
PRETREATMENT LOADING RATE (GPM/SF)	1.5
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS
FOR PATENT INFORMATION, GO TO www.ContechES.com/IP

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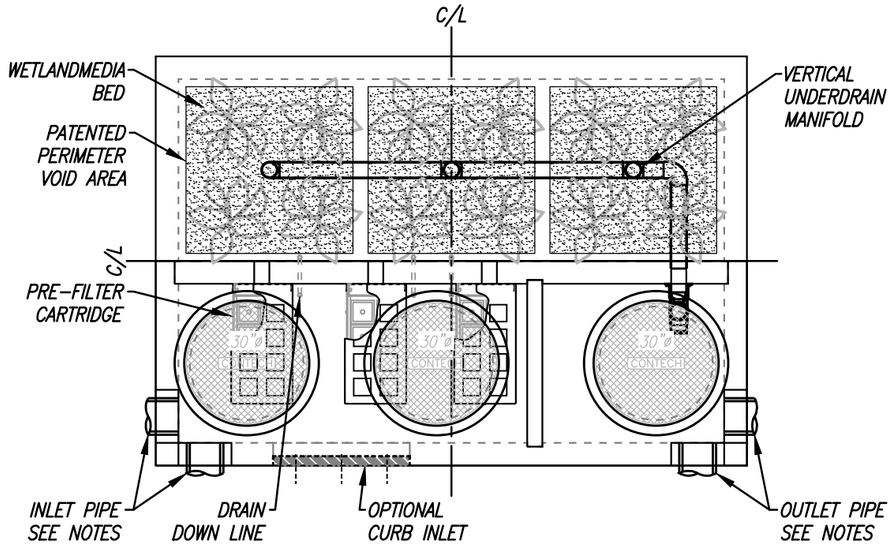
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com

MWS-L-8-24-7'-8"-V-HC
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

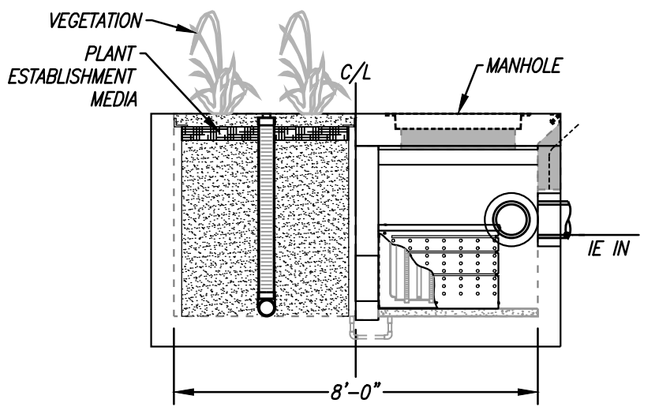
2.26.24\MADELINE.DANFORTH

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
TREATMENT FLOW (CFS)			
PRETREATMENT LOADING RATE (GPM/SF)			2.1 GPM/SF
WETLAND MEDIA LOADING RATE (GPM/SF)			1.0
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			_____ (CFS)
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
NOTES:			

* PRELIMINARY ONLY - NOT FOR CONSTRUCTION



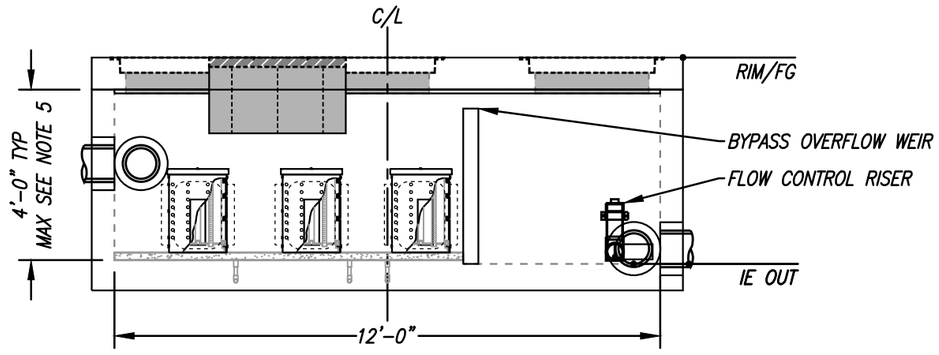
PLAN VIEW



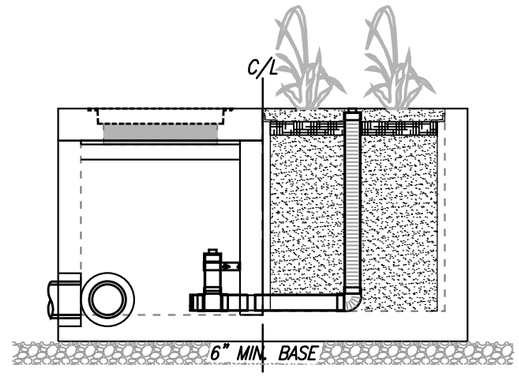
LEFT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
4. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.
5. VERTICAL HEIGHT VARIES BASED ON SITE SPECIFIC REQUIREMENTS.



ELEVATION VIEW



RIGHT END VIEW

MODULAR WETLANDS
FOR PATENT INFORMATION, GO TO www.ContechES.com/IP

PROPRIETARY AND CONFIDENTIAL:
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CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com

MWS-L-8-12-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

8/14/23SCOTT.SERTICH

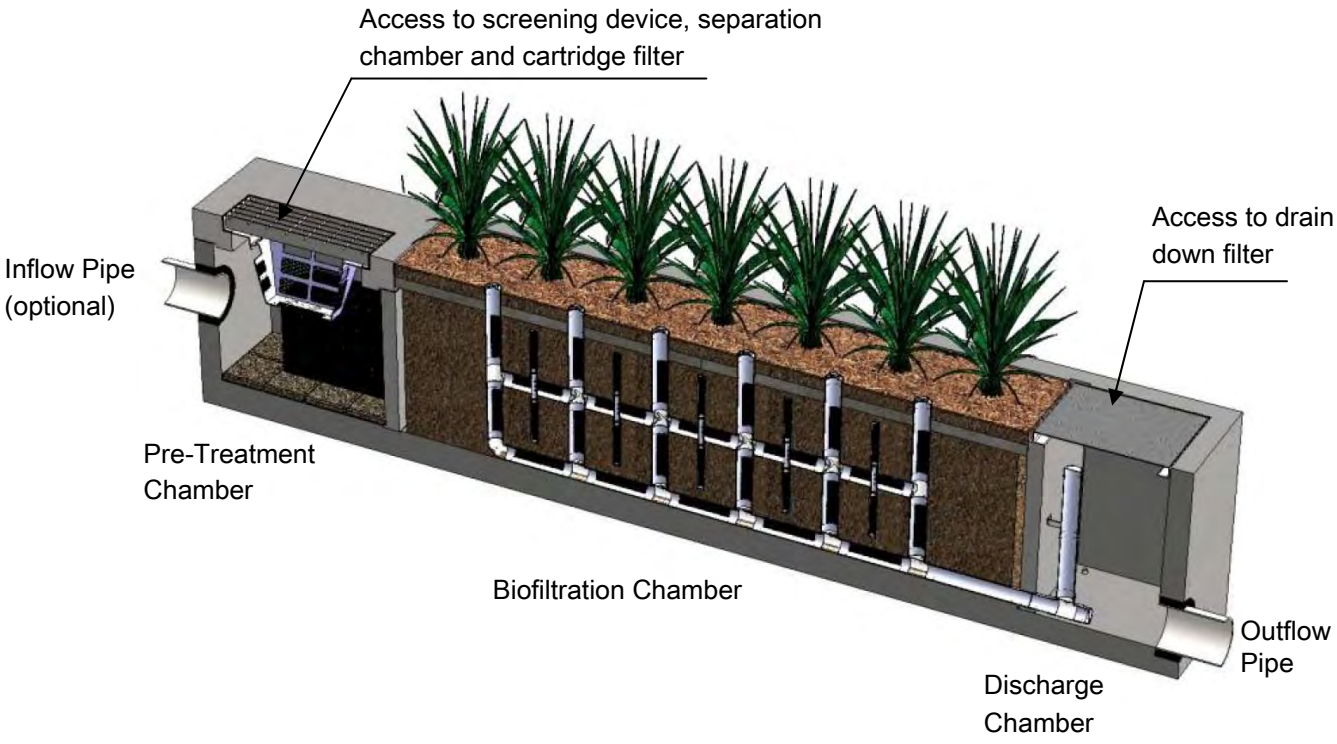
MAINTENANCE GUIDELINES FOR MODULAR WETLANDS SYSTEM

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

Screening Device

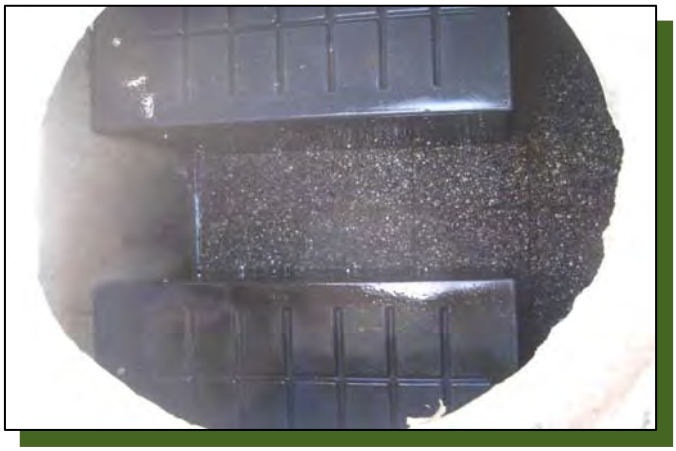
The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.

Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.



Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

STATE WATER RESOURCES CONTROL BOARD'S CERTIFIED FULL CAPTURE SYSTEM LIST OF TRASH TREATMENT CONTROL DEVICES (UPDATED MAY 2021)

CERTIFIED FULL CAPTURE SYSTEM LIST OF TRASH TREATMENT CONTROL DEVICES (Updated May 2021)

Trash Provisions

In accordance with the Trash Provisions[1], all trash treatment control devices (Devices) installed after December 2, 2015 shall meet the Full Capture System definition[2] and be certified by the State Water Resources Control Board (State Water Board) Executive Director, or designee, prior to installation. The Devices included on this list are either: 1) new Devices certified by the State Water Board, or 2) grandfathered Devices from a list maintained by the San Francisco Regional Water Board prior to the adoption of the Trash Amendments. All new Device installations shall be designed according to the following criteria:

1. Appropriately sized to treat not less than the peak flowrate resulting from a 1-year, 1-hour storm event (design storm) or at least the same peak flows from the corresponding storm drain;
2. Do not bypass trash below the design storm under maximum operational loading conditions; and
3. Trap all particles that are 5 mm or greater up to the design flow[3] or at least the same peak flows from the corresponding storm drain; and do not have a

[1] Amendment to the Water Quality Control Plan for Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, And Estuaries of California adopted by the State Water Board.

[2] A Full Capture System is a treatment control, or series of treatment controls, including but not limited to, a multi-benefit project or a low-impact development control that traps all particles that are 5 mm or greater, and has a design treatment capacity that is either: of not less than the peak flow rate, Q, resulting from a one-year, one-hour storm in the subdrainage area, or b) appropriately sized to, and designed to carry at least the same flows as, the corresponding storm drain.

[3] The region specific one-year, one-hour storm (or design flow) may be obtained from the National Oceanic and Atmospheric Precipitation Estimates. https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14_Volume6.pdf

diversion structure present upstream such that a portion of the peak flow is not treated to trap all particles 5 mm or greater.

Vector Control Accessibility

According to the California Health and Safety Code[4], Landowners in California are legally responsible to abate (eliminate the source of) a public nuisance arising from their property, including mosquitoes. Mosquito vector control districts have substantial authority to access public and private property, inspect known or suspected sources of mosquitoes, abate mosquito sources, and charge the landowner for work performed and/or charge fees if a landowner is unwilling or unable to address a mosquito source arising from their property.

Depending on the its design, certain Devices may impede the mosquito vector control district's ability to (1) visually inspect the Device and/or storm vault for mosquito breeding, and (2) apply the appropriate chemical treatment. Moreover, some devices may create a habitat for mosquitoes. Prior to installation of any certified Device, the local mosquito vector control district should be contacted to ensure the installation conforms to the District's visual inspection, treatment, and vector breeding minimizing guidelines. The Mosquito Vector Control Association of California Review Team may also be contacted via email at: (Trashtreatment@mvcac.org).

New Device Certification or Fact Sheet Update

To apply for certification of a new Device, or to update a grandfathered Device fact sheet, the Device owner shall submit an application/fact sheet in accordance with the *Trash Treatment Control Device Certification and Fact Sheet Update Requirements.* Upon determining that a Device application is complete and meets the definition of a trash full capture system and is approved by the Mosquito Vector Control Association of California, the Executive Director Designee will place the Device on the State Water Board's *Certified Full Capture System List of Trash Treatment Control Devices*. This list will also identify updates to grandfathered Device fact sheets that satisfy the requirements.

The *Trash Treatment Control Device Certification and Fact Sheet Update Requirements* is found on the Trash Implementation Program webpage (https://www.waterboards.ca.gov/water_issues/programs/stormwater/trash_implementation.html).

Listing of any Device does not constitute an endorsement by the State Water Board. The Executive Director reserves the right to de-certify and remove any Device from this list that does not satisfy the requirements of the Trash Provisions, such as but not limited to when a Device is discontinued or is not approved by Mosquito Vector Control Association of California Review Team.

[4] Health & Safety Code sections 2001- 4(d); 2002; 2060 (b) and Health & Safety Code sections 2060-2067, 100170, and 100175.

CERTIFIED FULL CAPTURE SYSTEM LIST OF TRASH TREATMENT CONTROL DEVICES

To obtain a copy of the applications or fact sheets listed in Table 1 or Table 2 below, or to address questions regarding certification please contact Leo Cosentini at (916) 341-5524 or email address (leo.cosentini@waterboards.ca.gov)

CERTIFIED FULL CAPTURE SYSTEM LIST OF TRASH TREATMENT CONTROL DEVICES

TABLE 1 - CATCH BASIN INSERTS AND OTHER DEVICES

Owner / Website	Full Capture System Trash Device Brand Name	Date Application Certified or Fact Sheet Updated	Date Vector Control Accessibility Verified
AbTech, Industries Internet site (https://www.abtechindustries.com/)	Ultra Urban Filter Curb Opening and Drop-In	Application 25 05/1/20	4/8/20
Advanced Drainage Systems, Inc. FLEXSTORM Division internet site (http://www.inletfilters.com/)	FLEXSTORM Full Trash Capture Inserts	Application 3 03/15/18	None
Advanced Drainage Systems, Inc. FLEXSTORM Division internet site (http://www.inletfilters.com/)	FLEXSTORM Connector Pipe Screen	ADS-1 Not Updated	None
Bio Clean® Environmental Services, Inc. Internet site (http://www.biocleanenvironmental.com/products/)	Curb Inlet and Grate Inlet Filters	Application 4 03/15/18	None
Bio Clean® Environmental Services, Inc. Internet site (http://www.biocleanenvironmental.com/products/)	Modular Connector Pipe Trash Screen	BC-3 Updated 4/30/20	3/10/20
BrightWater™ Internet site (www.wearebrightwater.com/)	Connector Pipe Screen	Application 29 12/28/20	11/19/20
BrightWater™ Internet site (www.wearebrightwater.com/)	Curb Inlet Filter	Application 26 6/30/20	4/17/20
CleanWay® Environmental Partners, Inc. Internet site (http://Cleanwayusa.com/)	CleanWay Curb Inlet Filtration System	Application 7 03/15/18	None

CERTIFIED FULL CAPTURE SYSTEM LIST OF TRASH TREATMENT CONTROL DEVICES

Owner / Website	Full Capture System Trash Device Brand Name	Date Application Certified or Fact Sheet Updated	Date Vector Control Accessibility Verified
CleanWay® Environmental Partners, Inc. Internet site (http://Cleanwayusa.com/)	CleanWay Drop Inlet	Application 8 03/15/18	None
Coanda Inc. Internet site (http://www.coanda.com/)	Coanda Trash Screen and Debris Fence	COA-1 No Update	None
Ecology Control Industries Internet site (http://www.ecologycontrol.com/)	Debris Dam - Catch Basin Insert for Curb Inlet Design	ECI-1 Updated 06/17/20	04/29/20
Enviropod International: A Stormwater360 Group Company Internet site (https://www.enviropod.com/products/enviropod-littatrap-full-capture/)	Enviropod® LittaTrap™ Full Capture	Application 27 10/15/20	07/20/20
Filtrexx Sustainable Technologies Internet site (https://www.filtrexx.com/en/products/stormexx/)	StormExx® Clean	Application 16 08/10/18 Updated 11/25/19	12/06/19
Frog Creek Partners, LLC Internet site (https://frogcreek.partners/)	Gutter Bin® Channel Filtration System & Mundus Bag® Water Filter	Application 22 06/26/19	04/19/19
Frog Creek Partners, LLC Internet site (https://frogcreek.partners/)	Gutter Bin® Eco Drop Inlet Filter (DIF & DIF-C) & Mundus Bag® Water Filter	Application 24 02/18/20	12/06/19

CERTIFIED FULL CAPTURE SYSTEM LIST OF TRASH TREATMENT CONTROL DEVICES

Owner / Website	Full Capture System Trash Device Brand Name	Date Application Certified or Fact Sheet Updated	Date Vector Control Accessibility Verified
Frog Creek Partners, LLC Internet site (https://frogcreek.partners/)	Gutter Bin® Eco Curb Inlet Filter & Mundus Bag® Water Filter	Application 23 02/18/20	10/11/19
G2 Construction, Inc. Internet site (http://www.g2construction.com/products/)	G2 CPS-Mod™ and Removable CPS-Mod™ Screen	Application 18 06/26/19	03/15/19
G2 Construction, Inc. Internet site (http://www.g2construction.com/products/)	G2 Grated Inlet Trash Screen	Application 19 06/26/19	04/10/19
Inventive Resources, Inc. Internet site (http://www.IRIproducts.com/)	Water Decontaminator	Application 2 03/15/18	4/20/20
Oldcastle Infrastructure™ Internet site (https://oldcastleinfrastructure.com/brands/)	Flo Guard Curb Inlet Basket	OI-1 No Update	04/30/21
Oldcastle Infrastructure™ Internet site (https://oldcastleinfrastructure.com/brands/)	Flo Guard Grate Inlet Basket	OI-2 No Update	04/30/21
Oldcastle Infrastructure™ Internet site (https://oldcastleinfrastructure.com/brands/)	Flo Guard Outlet Trash Screen	OI-3 Updated 11/29/19	12/06/19

CERTIFIED FULL CAPTURE SYSTEM LIST OF TRASH TREATMENT CONTROL DEVICES

Owner / Website	Full Capture System Trash Device Brand Name	Date Application Certified or Fact Sheet Updated	Date Vector Control Accessibility Verified
Revel Environmental Manufacturing, Inc. Internet site (http://www.remfilters.com/)	**Triton™ Bioflex Inlet Trash Guard Catchbasin Polyester Fiber Mesh Trash Filter Insert**	**REM-1** **No Update**	**None**
Revel Environmental Manufacturing, Inc. Internet site (http://www.remfilters.com/)	**Triton™ Crescent Pipe Screen**	**Application 12** **07/10/18**	**03/15/19**
Revel Environmental Manufacturing, Inc. Internet site (http://www.remfilters.com/)	**Triton Perf-Full Trash Capture Insert**	**Application 13** **07/10/18**	**03/15/19**
Safe Drain Stormwater Holdings Inc. Internet site (http://www.safedrainusa.com/)	**Storm Vector Guard**	**Application 30** **02/11/21**	**12/17/20**
Stormtek Internet site (https://swimsclean.com/stormtek/) [formerly Advanced Solutions]	**Stormtek ST3 & STEG Catchbasin Connector Pipe**	**AS-1, A1S-2** **No Update**	**None**
United Stormwater, Inc. Internet site (http://www.unitedstormwater.com/)	**Connector Pipe Trash Screen**	**USW-1** **No Update**	**None**

CERTIFIED FULL CAPTURE SYSTEM LIST OF TRASH TREATMENT CONTROL DEVICES

TABLE 2 - HIGH FLOW CAPACITY TRASH DEVICES

Owner / Website	Full Capture System Trash Device Brand Name	Date Application Certified or Fact Sheet Updated	Date Vector Control Accessibility Verified
AquaShield™, Inc. Internet site (http://www.aquashieldinc.com/-aqua-swirl.html)	Aqua-Swirl® Stormwater Treatment System	Application 1 08/04/17 Updated 11/06/20	12/03/20
BaySaver Technologies® LLC/Advanced Drainage Systems Inc. Internet site (https://baysaver.com/products/barracuda/)	Barracuda Hydrodynamic Separator	Application 21 06/26/19	03/15/19
Bio Clean® Environmental Services, Inc. Internet site (http://www.biocleanenvironmental.com/products/)	Debris Separating Baffle Box	Application 6 03/15/18	07/28/20
Bio Clean® Environmental Services, Inc. Internet site (http://www.biocleanenvironmental.com/products/)	BioClean DeflectiveScreening Device	Application 20 06/26/19	07/28/20
Bio Clean® Environmental Services, Inc. Internet site (http://www.biocleanenvironmental.com/products/)	Modular Wetland System®	Application 15 07/10/18	03/15/19
Contech® Construction Products Internet site (http://www.conteches.com/products/stormwater-management/treatment/cds/)	Continuous Deflective Separator Hydrodynamic Separator	CCP-1HF No Update	None

CERTIFIED FULL CAPTURE SYSTEM LIST OF TRASH TREATMENT CONTROL DEVICES

Owner / Website	Full Capture System Trash Device Brand Name	Date Application Certified or Fact Sheet Updated	Date Vector Control Accessibility Verified
Jensen® Stormwater Systems Internet site (http://www.jensenengineeredsystems.com/)	**Jensen® Deflective Separators**	**Application 5** **03/15/18**	**12/06/19**
Hydro International® Internet site (https://www.hydro-int.com/)	**Downstream Defender (In-Line and Off-Line Configurations)**	**Application 14** **07/10/18**	**03/16/20**
Hydro International® Internet site (https://www.hydro-int.com/)	**First Defense® High-Capacity Full Trash Capture Device**	**Application 28** **10/30/20**	**08/20/20**
Hydro International® Internet site (https://www.hydro-int.com/)	**Hydro Up-Flo Filter®**	**Application 11** **07/18/18**	**03/16/20**
Hydro International® Internet site (https://www.hydro-Int.com/)	**Hydro DryScreen**	**Application 10** **07/10/18** **Updated 05/05/21**	**04/29/21**
Oldcastle Infrastructure™ Internet site (https://oldcastleinfrastructure.com/brands/)	**FloGard® NetTech**	**OI-11HF** **Updated 12/08/20**	**12/03/20**

CERTIFIED FULL CAPTURE SYSTEM LIST OF TRASH TREATMENT CONTROL DEVICES

Owner / Website	Full Capture System Trash Device Brand Name	Date Application Certified or Fact Sheet Updated	Date Vector Control Accessibility Verified
Oldcastle Infrastructure™ Internet site (https://oldcastleinfrastructure.com/brands/)	**Nutrient Separating Baffle Box®**	**Application 17** **10/12/18** **Updated 07/21/20**	**05/01/20**
Roscoe Moss Company Internet site (https://roscoemoss.com/products/stormwater-gross-solids-removal-device/)	**Storm Flo® Trash Screen – Linear Radial Gross Solids Removal Device**	**RMC-1HF** **No Update**	**None**
StormTrap® Modular Concrete Stormwater Management Internet site (http://stormtrap.com/)	**Inline Netting Trash Trap – Inline Pipe Net with Trash Screen**	**FCT-1HF** **No Update**	**None**
StormTrap® Modular Concrete Stormwater Management Internet site (http://stormtrap.com/)	**End of Pipe Netting Trash Trap –End of Pipe Net with Trash Screen**	**FCT-2HF** **No Update**	**None**
StormTrap® Modular Concrete Stormwater Management Internet site (http://stormtrap.com/)	**SiteSaver®**	**Application 9**	**03/18/21**

Section VII Educational Materials

Education Materials			
Residential Material (http://www.ocwatersheds.com)	Check If Applicable	Business Material (http://www.ocwatersheds.com)	Check If Applicable
The Ocean Begins at Your Front Door	X	Tips for the Automotive Industry	
Tips for Car Wash Fund-raisers		Tips for Using Concrete and Mortar	
Tips for the Home Mechanic		Tips for the Food Service Industry	X
Homeowners Guide for Sustainable Water Use		Proper Maintenance Practices for Your Business	X
Household Tips		Other Material	Check If Attached
Proper Disposal of Household Hazardous Waste			
Recycle at Your Local Used Oil Collection Center (North County)			
Recycle at Your Local Used Oil Collection Center (Central County)			
Recycle at Your Local Used Oil Collection Center (South County)			
Tips for Maintaining a Septic Tank System			
Responsible Pest Control	X		
Sewer Spill	X		
Tips for the Home Improvement Projects			
Tips for Horse Care			
Tips for Landscaping and Gardening	X		
Tips for Pet Care			
Tips for Pool Maintenance			
Tips for Residential Pool, Landscape and Hardscape Drains			
Tips for Projects Using Paint	X		

APPENDICES

APPENDIX A

EDUCATIONAL MATERIALS

- The Ocean Begins at Your Front Door
- Responsible Pest Control
- Sewage Spill Reference Guide
- Tips for Landscape & Gardening
- Tips for Projects Using Paint
- Tips for the Food Service Industry
- Proper Maintenance Practices for Your Business

The Ocean Begins at Your Front Door

Follow these simple steps to help reduce water pollution:

Household Activities

- Do not rinse spills with water. Use dry cleanup methods such as applying cat litter or another absorbent material, sweep and dispose of in the trash. Take items such as used or excess batteries, oven cleaners, automotive fluids, painting products and cathode ray tubes, like TVs and computer monitors, to a Household Hazardous Waste Collection Center (HHWCC).
- For a HHWCC near you call (714) 834-6752 or visit www.oclandfills.com.
- Do not hose down your driveway, sidewalk or patio to the street, gutter or storm drain. Sweep up debris and dispose of it in the trash.

Automotive

- Take your vehicle to a commercial car wash whenever possible. If you wash your vehicle at home, choose soaps, cleaners, or detergents labeled non-toxic, phosphate- free or biodegradable. Vegetable and citrus-based products are typically safest for the environment.
- Do not allow washwater from vehicle washing to drain into the street, gutter or storm drain. Excess washwater should be disposed of in the sanitary sewer (through a sink or toilet) or onto an absorbent surface like your lawn.
- Monitor your vehicles for leaks and place a pan under leaks. Keep your vehicles well maintained to stop and prevent leaks.
- Never pour oil or antifreeze in the street, gutter or storm drain. Recycle these substances at a service station, a waste oil collection center or used oil recycling center. For the nearest Used Oil Collection Center call 1-800-CLEANUP or visit www.1800cleanup.org.

Pool Maintenance

- Pool and spa water must be dechlorinated and free of excess acid, alkali or color to be allowed in the street, gutter or storm drain.
- When it is not raining, drain dechlorinated pool and spa water directly into the sanitary sewer.
- Some cities may have ordinances that do not allow pool water to be disposed of in the storm drain. Check with your city.

Landscape and Gardening

- Do not over-water. Water your lawn and garden by hand to control the amount of water you use or set irrigation systems to reflect seasonal water needs. If water flows off your yard onto your driveway or sidewalk, your system is over-watering. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of waste by composting, hauling it to a permitted landfill, or as green waste through your city's recycling program.
- Follow directions on pesticides and fertilizer, (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Take unwanted pesticides to a HHWCC to be recycled. For locations and hours of HHWCC, call (714) 834-6752 or visit www.oclandfills.com.

Trash

- Place trash and litter that cannot be recycled in securely covered trash cans.
- Whenever possible, buy recycled products.
- Remember: Reduce, Reuse, Recycle.

Pet Care

- Always pick up after your pet. Flush waste down the toilet or dispose of it in the trash. Pet waste, if left outdoors, can wash into the street, gutter or storm drain.
- If possible, bathe your pets indoors. If you must bathe your pet outside, wash it on your lawn or another absorbent/permeable surface to keep the washwater from entering the street, gutter or storm drain.
- Follow directions for use of pet care products and dispose of any unused products at a HHWCC.

Common Pollutants

Home Maintenance

- Detergents, cleaners and solvents
- Oil and latex paint
- Swimming pool chemicals
- Outdoor trash and litter

Lawn and Garden

- Pet and animal waste
- Pesticides
- Clippings, leaves and soil
- Fertilizer

Automobile

- Oil and grease
- Radiator fluids and antifreeze
- Cleaning chemicals
- Brake pad dust

The Ocean Begins at Your Front Door

Never allow pollutants to enter the street, gutter or storm drain!

Did You Know?

- Most people believe that the largest source of water pollution in urban areas comes from specific sources such as factories and sewage treatment plants. In fact, the largest source of water pollution comes from city streets, neighborhoods, construction sites and parking lots. This type of pollution is sometimes called “non-point source” pollution.
- There are two types of non-point source pollution: stormwater and urban runoff pollution.
- Stormwater runoff results from rainfall. When rainstorms cause large volumes of water to rinse the urban landscape, picking up pollutants along the way.
- Urban runoff can happen any time of the year when excessive water use from irrigation, vehicle washing and other sources carries trash, lawn clippings and other urban pollutants into storm drains.

Where Does It Go?

- Anything we use outside homes, vehicles and businesses – like motor oil, paint, pesticides, fertilizers and cleaners – can be blown or washed into storm drains.
- A little water from a garden hose or rain can also send materials into storm drains.
- Storm drains are separate from our sanitary sewer systems; unlike water in sanitary sewers (from sinks or toilets), water in storm drains is not treated before entering our waterways.

Sources of Non-Point Source Pollution

- Automotive leaks and spills.
- Improper disposal of used oil and other engine fluids.
- Metals found in vehicle exhaust, weathered paint, rust, metal plating and tires.
- Pesticides and fertilizers from lawns, gardens and farms.
- Improper disposal of cleaners, paint and paint removers.
- Soil erosion and dust debris from landscape and construction activities.
- Litter, lawn clippings, animal waste, and other organic matter.
- Oil stains on parking lots and paved surfaces.

The Effect on the Ocean

Non-point source pollution can have a serious impact on water quality in Orange County. Pollutants from the storm drain system can harm marine life as well as coastal and wetland habitats. They can also degrade recreation areas such as beaches, harbors and bays.

Stormwater quality management programs have been developed throughout Orange County to educate and encourage the public to protect water quality, monitor runoff in the storm drain system, investigate illegal dumping and maintain storm drains.

Support from Orange County residents and businesses is needed to improve water quality and reduce urban runoff pollution. Proper use and disposal of materials will help stop pollution before it reaches the storm drain and the ocean.

For More Information

Orange County Stormwater Program

California Environmental Protection Agency
www.calepa.ca.gov

- **Air Resources Board**
  www.arb.ca.gov
- **Department of Pesticide Regulation**
  www.cdpr.ca.gov
- **Department of Toxic Substances Control**
  www.dtsc.ca.gov
- **Integrated Waste Management Board**
  www.ciwmb.ca.gov
- **Office of Environmental Health Hazard Assessment**
  www.oehha.ca.gov
- **State Water Resources Control Board**
  www.waterboards.ca.gov

Earth 911 - Community-Specific Environmental Information 1-800-cleanup or visit www.1800cleanup.org

Health Care Agency's Ocean and Bay Water Closure and Posting Hotline
(714) 433-6400 or visit www.ocbeachinfo.com

Integrated Waste Management Dept. of Orange County (714) 834-6752 or visit www.oclandfills.com for information on household hazardous waste collection centers, recycling centers and solid waste collection

O.C. Agriculture Commissioner
(714) 447-7100 or visit www.ocagcomm.com

Stormwater Best Management Practice Handbook
Visit www.cabmphandbooks.com

UC Master Gardener Hotline
(714) 708-1646 or visit www.uccemg.com

The Orange County Stormwater Program has created and moderates an electronic mailing list to facilitate communications, take questions and exchange ideas among its users about issues and topics related to stormwater and urban runoff and the implementation of program elements. To join the list, please send an email to ocstormwaterinfo-join@list.ocwatersheds.com

Aliso Viejo	(949)	425-2535
Anaheim Public Works Operations	(714)	765-6860
Brea Engineering	(714)	990-7666
Buena Park Public Works	(714)	562-3655
Costa Mesa Public Services	(714)	754-5323
Cypress Public Works	(714)	229-6740
Dana Point Public Works	(949)	248-3584
Fountain Valley Public Works	(714)	593-4441
Fullerton Engineering Dept.	(714)	738-6853
Garden Grove Public Works	(714)	741-5956
Huntington Beach Public Works	(714)	536-5431
Irvine Public Works	(949)	724-6315
La Habra Public Services	(562)	905-9792
La Palma Public Works	(714)	690-3310
Laguna Beach Water Quality	(949)	497-0378
Laguna Hills Public Services	(949)	707-2650
Laguna Niguel Public Works	(949)	362-4337
Laguna Woods Public Works	(949)	639-0500
Lake Forest Public Works	(949)	461-3480
Los Alamitos Community Dev.	(562)	431-3538
Mission Viejo Public Works	(949)	470-3056
Newport Beach, Code & Water Quality Enforcement	(949)	644-3215
Orange Public Works	(714)	532-6480
Placentia Public Works	(714)	993-8245
Rancho Santa Margarita	(949)	635-1800
San Clemente Environmental Programs	(949)	361-6143
San Juan Capistrano Engineering	(949)	234-4413
Santa Ana Public Works	(714)	647-3380
Seal Beach Engineering	(562)	431-2527 x317
Stanton Public Works	(714)	379-9222 x204
Tustin Public Works/Engineering	(714)	573-3150
Villa Park Engineering	(714)	998-1500
Westminster Public Works/Engineering	(714)	898-3311 x446
Yorba Linda Engineering	(714)	961-7138
Orange County Stormwater Program	(877)	897-7455

Orange County 24-Hour
Water Pollution Problem Reporting Hotline
1-877-89-SPILL (1-877-897-7455)

On-line Water Pollution Problem Reporting Form
www.ocwatersheds.com

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Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as pest control can lead to water pollution if you're not careful. Pesticide treatments must be planned and applied properly to ensure that pesticides do not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump pesticides into the ocean, so don't let it enter the storm drains. Pesticides can cause significant damage to our environment if used improperly. If you are thinking of using a pesticide to control a pest, there are some important things to consider.

For more information,
please call
University of California Cooperative
Extension Master Gardeners at
(714) 708-1646
or visit these Web sites:
www.uccemg.org
www.ipm.ucdavis.edu

For instructions on collecting a specimen sample visit the Orange County Agriculture Commissioner's website at:
http://www.ocagcomm.com/ser_lab.asp

To report a spill, call the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
at 1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

Information From:
Cheryl Wilen, Area IPM Advisor; Darren Haver, Watershed Management Advisor; Mary Louise Flint, IPM Education and Publication Director; Pamela M. Geisel, Environmental Horticulture Advisor; Carolyn L. Unruh, University of California Cooperative Extension staff writer. Photos courtesy of the UC Statewide IPM Program and Darren Haver.

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Help Prevent Ocean Pollution:

Responsible Pest Control

Tips for Pest Control

Key Steps to Follow:

Step 1: Correctly identify the pest (insect, weed, rodent, or disease) and verify that it is actually causing the problem.

Three life stages of the common lady beetle, a beneficial insect.

This is important because beneficial insects are often mistaken for pests and sprayed with pesticides needlessly.

Consult with a Certified Nursery Professional at a local nursery or garden center or send a sample of the pest to the Orange County Agricultural Commissioner's Office.

Determine if the pest is still present – even though you see damage, the pest may have left.

Step 2: Determine how many pests are present and causing damage.

Small pest populations may be controlled more safely using non-pesticide techniques. These include removing food sources, washing off leaves with a strong stream of water, blocking entry into the home using caulking and replacing problem plants with ones less susceptible to pests.

Integrated Pest Management (IPM) usually combines several least toxic pest control methods for long-term prevention and management of pest problems without harming you, your family, or the environment.

UC CE University of California Cooperative Extension

Step 3: If a pesticide must be used, choose the least toxic chemical.

Obtain information on the least toxic pesticides that are effective at controlling the target pest from the UC Statewide Integrated Pest Management (IPM) Program's Web site at www.ipm.ucdavis.edu.

Seek out the assistance of a Certified Nursery Professional at a local nursery or garden center when selecting a pesticide. Purchase the smallest amount of pesticide available.

Apply the pesticide to the pest during its most vulnerable life stage. This information can be found on the pesticide label.

Step 4: Wear appropriate protective clothing.

Follow pesticide labels regarding specific types of protective equipment you should wear. Protective clothing should always be washed separately from other clothing.

Step 5: Continuously monitor external conditions when applying pesticides such as weather, irrigation, and the presence of children and animals.

Never apply pesticides when rain is predicted within the next 48 hours. Also, do not water after applying pesticides unless the directions say it is necessary.

Apply pesticides when the air is still; breezy conditions may cause the spray or dust to drift away from your targeted area.

In case of an emergency call 911 and/or the regional poison control number at (714) 634-5988 or (800) 544-4404 (CA only).

For general questions you may also visit www.calpoison.org.

Step 6: In the event of accidental spills, sweep up or use an absorbent agent to remove any excess pesticides. Avoid the use of water.

Be prepared. Have a broom, dust pan, or dry absorbent material, such as cat litter, newspapers or paper towels, ready to assist in cleaning up spills.

Contain and clean up the spill right away. Place contaminated materials in a doubled plastic bag. All materials used to clean up the spill should be properly disposed of according to your local Household Hazardous Waste Disposal site.

Step 7: Properly store and dispose of unused pesticides.

Purchase Ready-To-Use (RTU) products to avoid storing large concentrated quantities of pesticides.

Store unused chemicals in a locked cabinet.

Unused pesticide chemicals may be disposed of at a Household Hazardous Waste Collection Center.

Empty pesticide containers should be triple rinsed prior to disposing of them in the trash.

Household Hazardous Waste Collection Center
(714) 834-6752
www.oclandfills.com

PROJECT Pollution PREVENTION

Sewage Spill Regulatory Requirements

Allowing sewage to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up efforts.

Here are the pertinent codes, fines, and agency contact information that apply.

Orange County Stormwater Program
24 Hour Water Pollution Reporting Hotline
1-877-89-SPILL (1-877-897-7455)

- County and city water quality ordinances prohibit discharges containing pollutants.

Orange County Health Care Agency Environmental Health
(714) 433-6419

California Health and Safety Code, Sections 5410-5416

- No person shall discharge raw or treated sewage or other waste in a manner that results in contamination, pollution or a nuisance.
- Any person who causes or permits a sewage discharge to any state waters:
  - must immediately notify the local health agency of the discharge.
  - shall reimburse the local health agency for services that protect the public's health and safety (water-contact receiving waters).
  - who fails to provide the required notice to the local health agency is guilty of a misdemeanor and shall be punished by a fine (between $500–$1,000) and/or imprisonment for less than one year.

Regional Water Quality Control Board
Santa Ana Region (951) 782-4130
San Diego Region (858) 467-2952

- Requires the prevention, mitigation, response to and reporting of sewage spills.

California Office of Emergency Services
(800) 852-7550

California Water Code, Article 4, Chapter 4, Sections 13268-13271
California Code of Regulations, Title 23, Division 3, Chapter 9.2, Article 2, Sections 2250-2260

- Any person who causes or permits sewage in excess of 1,000 gallons to be discharged to state waters **shall immediately notify the Office of Emergency Services.**
- Any person who fails to provide the notice required by this section is **guilty of a misdemeanor** and shall be punished by a fine (less than $20,000) and/or imprisonment for not more than one year.

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Sewage Spill
Reference Guide

Your Responsibilities as a Private Property Owner

Residences
Businesses
Homeowner/Condominium Associations
Federal and State Complexes
Military Facilities

Orange County Sanitation District

Health Care Agency
Environmental Health

PROJECT Pollution PREVENTION
www.ocwatersheds.com

This brochure was designed courtesy of the Orange County Sanitation District (OCSD). For additional information, call (714) 962-2411, or visit their website at www.ocsd.com

What is a Sewage Spill?

Sewage spills occur when the wastewater being transported via underground pipes overflows through a manhole, cleanout or broken pipe. Sewage spills can cause health hazards, damage to homes and businesses, and threaten the environment, local waterways and beaches.

Common Causes of Sewage Spills

Grease builds up inside and eventually blocks sewer pipes. Grease gets into the sewer from food establishments, household drains, as well as from poorly maintained commercial grease traps and interceptors.

Structure problems caused by tree roots in the lines, broken/cracked pipes, missing or broken cleanout caps or undersized sewers can cause blockages.

Infiltration and inflow (I/I) impacts pipe capacity and is caused when groundwater or rainwater enters the sewer system through pipe defects and illegal connections.

You Are Responsible for a Sewage Spill Caused by a Blockage or Break in Your Sewer Lines!

Time is of the essence in dealing with sewage spills. You are required to **immediately**:

Control and minimize the spill. Keep spills contained on private property and out of gutters, storm drains and public waterways by shutting off or not using the water.

Use sandbags, dirt and/or plastic sheeting to prevent sewage from entering the storm drain system.

Clear the sewer blockage. Always wear gloves and wash your hands. It is recommended that a plumbing professional be called for clearing blockages and making necessary repairs.

Always notify your city sewer/public works department or public sewer district of sewage spills. If the spill enters the storm drains also notify the Health Care Agency. In addition, if it exceeds 1,000 gallons notify the Office of Emergency Services. Refer to the numbers listed in this brochure.

Overflowing cleanout pipe located on private property

You Could Be Liable

Allowing sewage from your home, business or property to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up and enforcement efforts. See Regulatory Codes & Fines section for pertinent codes and fines that apply.

What to Look For

Sewage spills can be a very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed. Don't dismiss unaccounted-for wet areas.

Look for:

- Drain backups inside the building.
- Wet ground and water leaking around manhole lids onto your street.
- Leaking water from cleanouts or outside drains.
- Unusual odorous wet areas: sidewalks, external walls or ground/landscape around a building.

Caution

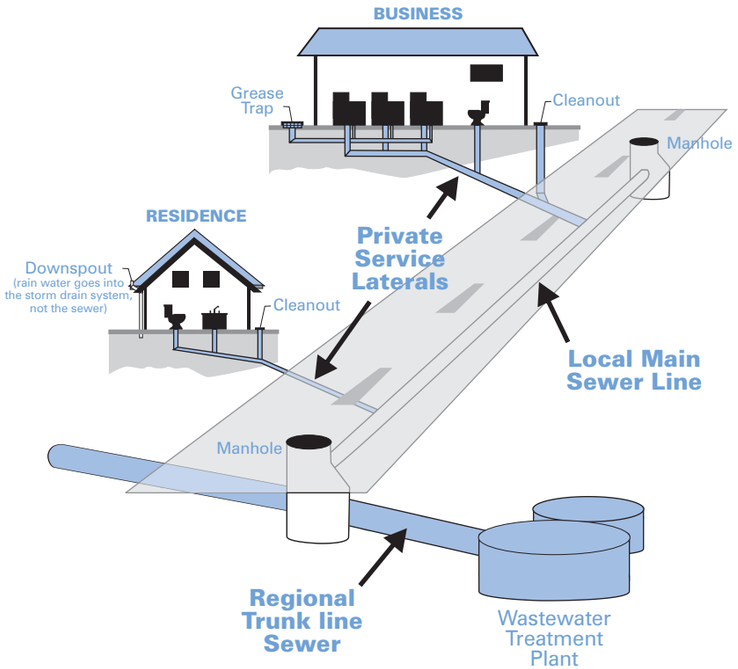
Keep people and pets away from the affected area. Untreated sewage has high levels of disease-causing viruses and bacteria. Call your local health care agency listed on the back for more information.

If You See a Sewage Spill Occurring, Notify Your City Sewer/Public Works Department or Public Sewer District IMMEDIATELY!

How a Sewer System Works

A property owner's sewer pipes are called service laterals and are connected to larger local main and regional trunk lines. Service laterals run from the connection at the home to the connection with the public sewer (including the area under the street). These laterals are the responsibility of the property owner and must be maintained by the property owner. Many city agencies have adopted ordinances requiring maintenance of service laterals. Check with your city sewer/local public works department for more information.

Operation and maintenance of **local and regional sewer lines** are the responsibility of the city sewer/public works departments and public sewer districts.



How You Can Prevent Sewage Spills

1. **Never put grease down garbage disposals, drains or toilets.**
2. **Perform periodic cleaning to eliminate grease, debris and roots in your service laterals.**
3. **Repair any structural problems in your sewer system and eliminate any rainwater infiltration/inflow leaks into your service laterals.**

Preventing Grease Blockages

The drain is not a dump! Recycle or dispose of grease properly and never pour grease down the drain.

Homeowners should mix fats, oils and grease with absorbent waste materials such as paper, coffee grounds, or kitty litter and place it in the trash. Wipe food scraps from plates and pans and dump them in the trash.

Restaurants and commercial food service establishments should always use "Kitchen Best Management Practices." These include:

- Collecting all cooking grease and liquid oil from pots, pans and fryers in covered grease containers for recycling.
- Scraping or dry-wiping excess food and grease from dishes, pots, pans and fryers into the trash.
- Installing drain screens on all kitchen drains.
- Having spill kits readily available for cleaning up spills.
- Properly maintaining grease traps or interceptors by having them serviced regularly. Check your local city codes.

Orange County Agency Responsibilites

- **City Sewer/Public Works Departments—** Responsible for protecting city property and streets, the local storm drain system, sewage collection system and other public areas.
- **Public Sewer/Sanitation District—** Responsible for collecting, treating and disposing of wastewater.
- **County of Orange Health Care Agency—** Responsible for protecting public health by closing ocean/bay waters and may close food-service businesses if a spill poses a threat to public health.
- **Regional Water Quality Control Boards—** Responsible for protecting State waters.
- **Orange County Stormwater Program—** Responsible for preventing harmful pollutants from being discharged or washed by stormwater runoff into the municipal storm drain system, creeks, bays and the ocean.

You Could Be Liable for Not Protecting the Environment

Local and state agencies have legal jurisdiction and enforcement authority to ensure that sewage spills are remedied.

They may respond and assist with containment, relieving pipe blockages, and/or clean-up of the sewage spill, especially if the spill is flowing into storm drains or onto public property.

A property owner may be charged for costs incurred by these agencies responding to spills from private properties.

Report Sewage Spills!

City Sewer/Public Works Departments

Aliso Viejo	(949) 425-2500
Anaheim	(714) 765-6860
Brea	(714) 990-7691
Buena Park	(714) 562-3655
Costa Mesa	(949) 645-8400
Cypress	(714) 229-6760
Dana Point	(949) 248-3562
Fountain Valley	(714) 593-4600
Fullerton	(714) 738-6897
Garden Grove	(714) 741-5375
Huntington Beach	(714) 536-5921
Irvine	(949) 453-5300
Laguna Beach	(949) 497-0765
Laguna Hills	(949) 707-2650
Laguna Niguel	(949) 362-4337
Laguna Woods	(949) 639-0500
La Habra	(562) 905-9792
Lake Forest	(949) 461-3480
La Palma	(714) 690-3310
Los Alamitos	(562) 431-3538
Mission Viejo	(949) 831-2500
Newport Beach	(949) 644-3011
Orange	(714) 532-6480
Orange County	(714) 567-6363
Placentia	(714) 993-8245
Rancho Santa Margarita	(949) 635-1800
San Clemente	(949) 366-1553
San Juan Capistrano	(949) 443-6363
Santa Ana	(714) 647-3380
Seal Beach	(562) 431-2527
Stanton	(714) 379-9222
Tustin	(714) 962-2411
Villa Park	(714) 998-1500
Westminster	(714) 893-3553
Yorba Linda	(714) 961-7170

Public Sewer/Water Districts

Costa Mesa Sanitary District	(714) 393-4433/ (949) 645-8400
El Toro Water District	(949) 837-0660
Emerald Bay Service District	(949) 494-8571
Garden Grove Sanitary District	(714) 741-5375
Irvine Ranch Water District	(949) 453-5300
Los Alamitos/Rossmoor Sewer District	(562) 431-2223
Midway City Sanitary District (Westminster)	(714) 893-3553
Moulton Niguel Water District	(949) 831-2500
Orange County Sanitation District	(714) 962-2411
Santa Margarita Water District	(949) 459-6420
South Coast Water District	(949) 499-4555
South Orange County Wastewater Authority	(949) 234-5400
Sunset Beach Sanitary District	(562) 493-9932
Trabuco Canyon Sanitary District	(949) 858-0277
Yorba Linda Water District	(714) 777-3018

Other Agencies

Orange County Health Care Agency	(714) 433-6419
Office of Emergency Services	(800) 852-7550

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour gardening products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

UCCE Master Gardener Hotline:
(714) 708-1646

To report a spill,
call the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while landscaping or gardening. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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Help Prevent Ocean Pollution:

Tips for Landscape & Gardening

The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Tips for Landscape & Gardening

Never allow gardening products or polluted water to enter the street, gutter or storm drain.

General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.
- Plant native vegetation to reduce the amount of water, fertilizers, and pesticide applied to the landscape.

- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.

Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro spray systems. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.

- Use slow-release fertilizers to minimize leaching, and use organic fertilizers.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.

- Rinse empty pesticide containers and re-use rinse water as you would use the product. Do not dump rinse water down storm drains. Dispose of empty containers in the trash.
- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting. For more information, visit **www.ipm.ucdavis.edu**.
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Hazardous Waste Collection Center to be recycled. Locations are provided below.

Household Hazardous Waste Collection Centers

Anaheim:	1071 N. Blue Gum St.
Huntington Beach:	17121 Nichols St.
Irvine:	6411 Oak Canyon
San Juan Capistrano:	32250 La Pata Ave.

For more information, call (714) 834-6752 or visit www.oclandfills.com

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as painting can lead to water pollution if you're not careful. Paint must be used, stored and disposed of properly to ensure that it does not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump paint into the ocean, so don't let it enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while using, storing and disposing of paint. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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Help Prevent Ocean Pollution:

Tips for Projects Using Paint

Tips for Projects Using Paint

Paint can cause significant damage to our environment. Whether you hire a contractor or do it yourself, it is important to follow these simple tips when purchasing, using, cleaning, storing and disposing of paint.

Purchasing Paint

- Measure the room or object to be painted, then buy only the amount needed.
- Whenever possible, use water-based paint since it usually does not require hazardous solvents such as paint thinner for cleanup.

Painting

- Use only one brush or roller per color of paint to reduce the amount of water needed for cleaning.
- Place open paint containers or trays on a stable surface and in a position that is unlikely to spill.
- Always use a tarp under the area or object being painted to collect paint drips and contain spills.

Cleaning

- Never clean brushes or rinse paint containers in the street, gutter or storm drain.
- For oil-based products, use as much of the paint on the brushes as possible. Clean brushes with thinner. To reuse thinner, pour it through a fine filter (e.g. nylon, metal gauze or filter paper) to remove solids such as leftover traces of paint.
- For water-based products, use as much of the paint on the brushes as possible, then rinse in the sink.
- Collect all paint chips and dust. Chips and dust from marine paints or paints containing lead, mercury or tributyl tin are hazardous waste. Sweep up and dispose of at a Household Hazardous Waste Collection Center (HHWCC).

Storing Paint

- Store paint in a dry location away from the elements.
- Store leftover water-based paint, oil-based paint and solvents separately in original or clearly marked containers.
- Avoid storing paint cans directly on cement floors. The bottom of the can will rust much faster on cement.
- Place the lid on firmly and store the paint can upside-down to prevent air from entering. This will keep the paint usable longer. Oil-based paint is usable for up to 15 years. Water-based paint remains usable for up to 10 years.

Alternatives to Disposal

- Use excess paint to apply another coat, for touch-ups, or to paint a closet, garage, basement or attic.
- Give extra paint to friends or family. Extra paint can also be donated to a local theatre group, low-income housing program or school.
- Take extra paint to an exchange program such as the **"Stop & Swap"** that allows you to drop off or pick up partially used home care products free of charge. **"Stop & Swap"** programs are available at most HHWCCs.
- For HHWCC locations and hours, call **(714) 834-6752** or visit **www.oclandfills.com**.

Disposing of Paint

- Never put wet paint in the trash.

For water-based paint:

- If possible, brush the leftover paint on cardboard or newspaper. Otherwise, allow the paint to dry in the can with the lid off in a well-ventilated area protected from the elements, children and pets. Stirring the paint every few days will speed up the drying.
- Large quantities of extra paint should be taken to a HHWCC.
- Once dried, paint and painted surfaces may be disposed of in the trash. When setting a dried paint can out for trash collection, leave the lid off so the collector will see that the paint has dried.

For oil-based paint:

- Oil-based paint is a household hazardous waste. All leftover paint should be taken to a HHWCC.

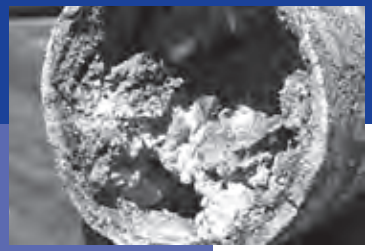
Aerosol paint:

- Dispose of aerosol paint cans at a HHWCC.

Spills

- Never hose down pavement or other impermeable surfaces where paint has spilled.
- Clean up spills immediately by using an absorbent material such as cat litter. Cat litter used to clean water-based paint spills can be disposed of in the trash. When cleaning oil-based paint spills with cat litter, it must be taken to a HHWCC.
- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at **(714) 567-6363** or visit **www.ocwatersheds.com** to fill out an incident reporting form.

PROJECT Pollution PREVENTION



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. Fats, oils and grease from restaurants and food service facilities can cause sewer line blockages that may result in sewage overflow into your facility and into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways and should never contain washwater, trash, grease or other materials.

You would never dump oil and trash into the ocean, so don't let it enter the storm drains. Follow these tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

Report sewage spills and
discharges that are not
contained to your site to the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455)

For emergencies, dial 911.

CALIFORNIA Restaurant ASSOCIATION SINCE 1906

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Help Prevent Ocean Pollution:

Tips for the Food Service Industry

The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Best Kitchen Practices

Food Waste Disposal

- Scrape food waste off of plates, utensils, pots, food preparation and cooking areas and dispose of it in the trash.
- Never put food waste down the drain. Food scraps often contain grease, which can clog sewer pipes and result in sewage backups and overflows.

Grease & Oil Disposal

- Never put oil or grease down the drain. Contain grease and oil by using covered grease storage containers or installing a grease interceptor.
- Never overfill your grease storage container or transport it without a cover.
- Grease control devices must be emptied and cleaned by permitted companies.
- Keep maintenance records on site.

- For a list of oil/grease recycling companies, contact the CIWMB at **www.ciwmb.ca.gov/foodwaste/render.htm** or contact your local sanitation district.

Minor Spill Cleanup

- Always use dry cleanup methods, such as a rag, damp mop or broom.
- Never hose a spill into the street, gutter or storm drain.

Major Spill Cleanup

- Have spill containment and clean-up kits readily available, and train all employees on how to use them.
- Immediately contain and clean the spill using dry methods.
- If the spill leaves your site, call **(714) 567-6363**.

Dumpster Cleanup

- Pick up all debris around the dumpster.
- Always keep the lid on the dumpster closed.

- Never pour liquids into the dumpster or hose it out.

Floor Mat Cleaning

- Sweep the floor mats regularly, discarding the debris into the trash.
- Hose off the mats in a mop sink, at a floor drain, or in an outoor area that can contain the water.

- Never hose the mats in an area where the wastewater can flow to the street, gutter or storm drain.

Washwater Disposal

- Dispose of washwater in a mop sink or an area with a floor drain.
- Never dispose of washwater in the street, gutter or storm drain.

PROJECT Pollution PREVENTION

Preventing water pollution at your commercial/industrial site

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many landscape and building maintenance activities can lead to water pollution if you're not careful. Paint, chemicals, plant clippings and other materials can be blown or washed into storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour soap or fertilizers into the ocean, so why would you let them enter the storm drains? Follow these easy tips to help prevent water pollution.

Some types of industrial facilities are required to obtain coverage under the State General Industrial Permit. For more information visit: **www.swrcb.ca.gov/stormwater/industrial.html**

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit **www.ocwatersheds.com**

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

RECYCLE USED OIL

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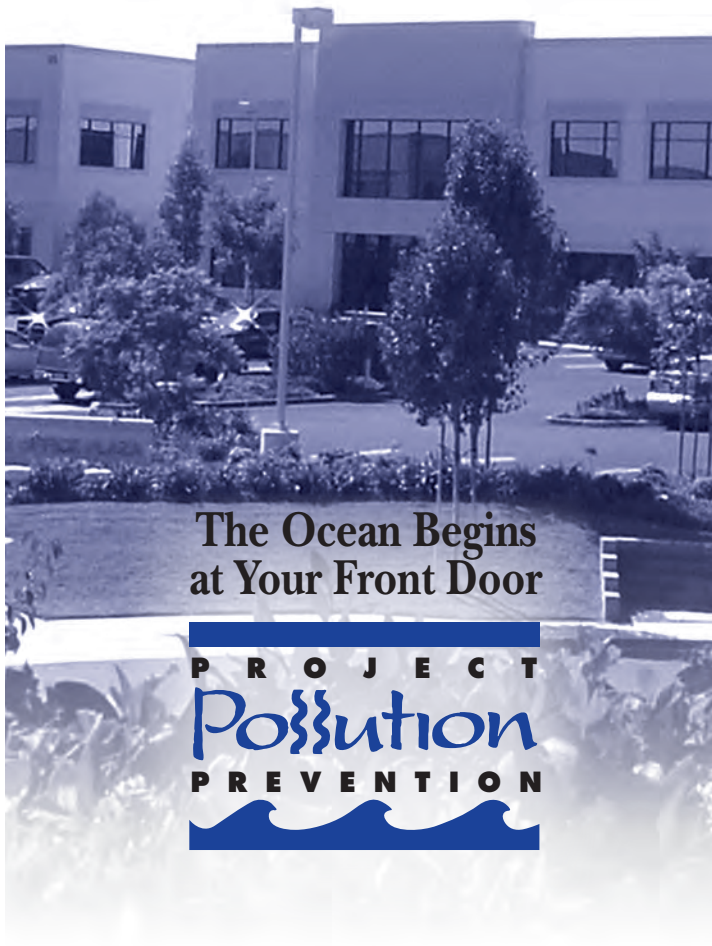
Help Prevent Ocean Pollution:

Proper Maintenance Practices for Your Business



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Proper Maintenance Practices for your Business

Landscape Maintenance

- Compost grass clippings, leaves, sticks and other vegetation, or dispose of it at a permitted landfill or in green waste containers. Do not dispose of these materials in the street, gutter or storm drain.
- Irrigate slowly and inspect the system for leaks, overspraying and runoff. Adjust automatic timers to avoid overwatering.
- Follow label directions for the use and disposal of fertilizers and pesticides.
- Do not apply pesticides or fertilizers if rain is expected within 48 hours or if wind speeds are above 5 mph.
- Do not spray pesticides within 100 feet of waterways.
- Fertilizers should be worked into the soil rather than dumped onto the surface.
- If fertilizer is spilled on the pavement or sidewalk, sweep it up immediately and place it back in the container.

Building Maintenance

- Never allow washwater, sweepings or sediment to enter the storm drain.
- Sweep up dry spills and use cat litter, towels or similar materials to absorb wet spills. Dispose of it in the trash.
- If you wash your building, sidewalk or parking lot, you **must** contain the water. Use a shop vac to collect the water and contact your city or sanitation agency for proper disposal information. Do not let water enter the street, gutter or storm drain.
- Use drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of materials in the trash.
- Use a ground cloth or oversized tub for mixing paint and cleaning tools.
- Use a damp mop or broom to clean floors.
- Cover dumpsters to keep insects, animals, rainwater and sand from entering. Keep the area around the dumpster clear of trash and debris. Do not overfill the dumpster.
- Call your trash hauler to replace leaking dumpsters.
- Do not dump any toxic substance or liquid waste on the pavement, the ground, or near a storm drain. Even materials that seem harmless such as latex paint or biodegradable cleaners can damage the environment.

NEVER DISPOSE OF ANYTHING IN THE STORM DRAIN.

- Recycle paints, solvents and other materials. For more information about recycling and collection centers, visit **www.oclandfills.com**.
- Store materials indoors or under cover and away from storm drains.
- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry, carpet, plastic, pipes, drywall, rocks, dirt, and green waste. For a listing of construction and demolition recycling locations in your area, visit **www.ciwmb.ca.gov/recycle.**
- Properly label materials. Familiarize employees with Material Safety Data Sheets.

PROJECT Pollution PREVENTION

APPENDIX B

POST CONSTRUCTION BMP FACT SHEETS

- SD-10 Site Design & Landscape Planning
- SD-12 Efficient Irrigation
- SD-13 Storm Drain Signage
- SD-32 Trash Storage Areas
- SC-35 Safer Alternative Products
- SC-42 Building Repair and Construction
- IC3 Building Maintenance
- IC7 Landscape Maintenance
- IC15 Parking and Storage Area Maintenance
- IC17 Spill Prevention and Cleanup
- IC21 Waste Handling and Disposal
- IC22 Eating and Drinking Establishments

Site Design & Landscape Planning SD-10

Design Objectives

- ✓ Maximize Infiltration
- ✓ Provide Retention
- ✓ Slow Runoff
- ✓ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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SD-10 Site Design & Landscape Planning

Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

SD-10 Site Design & Landscape Planning

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Efficient Irrigation SD-12

Design Objectives

- ✓ Maximize Infiltration
- ✓ Provide Retention
- ✓ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include "NO DUMPING

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– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.
- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Trash Storage Areas SD-32

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Safer Alternative Products SC-35

Description

Promote the use of less harmful products and products that contain little or no TMDL pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

Approach

Pattern a new program after the many established programs around the state and country. Integrate this best management practice as much as possible with existing programs at your facility.

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests by methods that pose a lower risk to employees, the public, and the environment.
- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies

Objectives

- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

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- Procedures
  - Standard operating procedures (SOPs)
  - Purchasing guidelines and procedures
  - Bid packages (services and supplies)
- Materials
  - Preferred or approved product and supplier lists
  - Product and supplier evaluation criteria
  - Training sessions and manuals
  - Fact sheets for employees

Implement this BMP in conjunction with the Vehicle and Equipment Management fact sheets (SC20 – SC22) and SC41, Building and Grounds Maintenance.

Training

- Employees who handle potentially harmful materials in the use of safer alternatives.
- Purchasing departments should be encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.

Regulations

This BMP has no regulatory requirements. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements,
- Storm water runoff sampling requirements,
- Training and licensing requirements, and
- Record keeping and reporting requirements.

Equipment

- There are no major equipment requirements to this BMP.

Limitations

- Alternative products may not be available, suitable, or effective in every case.

Requirements

Cost Considerations

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.

- Some alternative products may be slightly more expensive than conventional products.

Supplemental Information

Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources listed below.

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Rerefined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps. All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.
- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting.

Examples

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

References and Resources

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information

California Department of Toxic Substances Control (www.dtsc.ca.gov)

California Integrated Waste Management Board (www.ciwmb.ca.gov)

City of Santa Monica (www.santa-monica.org/environment)

City of Palo Alto (www.city.palo-alto.ca.us/cleanbay)

City and County of San Francisco, Department of the Environment (www.ci.sf.ca.us/sfenvironment)

Earth 911 (www.earth911.org/master.asp)

Environmental Finance Center Region IX (www.greenstart.org/efc9)

Flex Your Power (www.flexyourpower.ca.gov)

GreenBiz.com (www.greenbiz.com)

Green Business Program (www.abag.org/bayarea/enviro/gbus/gb.html)

Pacific Industrial and Business Association (www.piba.org)

Sacramento Clean Water Business Partners (www.sacstormwater.org)

USEPA BMP fact sheet – Alternative products (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/poll_2.cfm)

USEPA Region IX Pollution Prevention Program (www.epa.gov/region09/p2)

Western Regional Pollution Prevention Network (www.westp2net.org)

Metals (mercury, copper)

National Electrical Manufacturers Association - Environment, Health and Safety (www.nema.org)

Sustainable Conservation (www.suscon.org)

Auto Recycling Project

Brake Pad Partnership

Pesticides and Chemical Fertilizers

Bio-Integral Resource Center (www.birc.org)

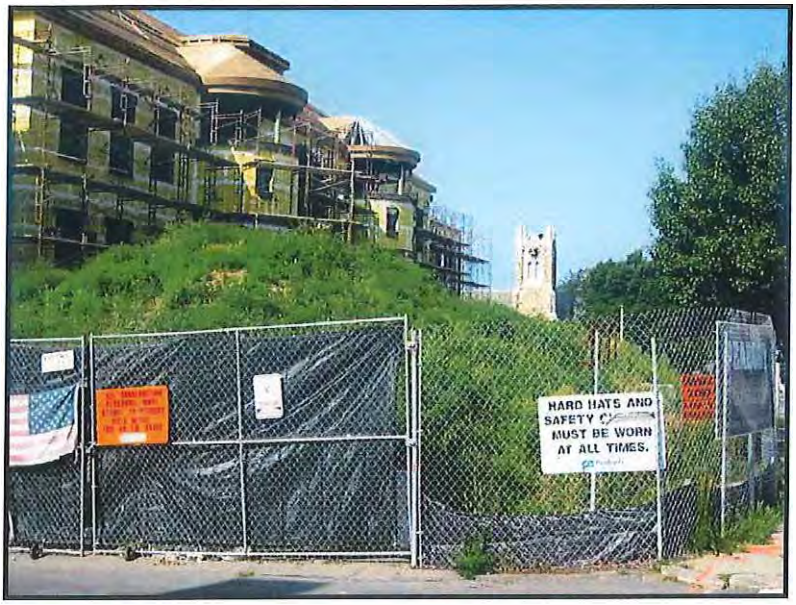
California Department of Pesticide Regulation (www.cdpr.ca.gov)

University of California Statewide IPM Program (www.ipm.ucdavis.edu/default.html)

Dioxins

Bay Area Dioxins Project (http://dioxin.abag.ca.gov/)

Building Repair and Construction SC-42



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Recycle

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Modifications are common particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

Approach

Pollution Prevention

- Recycle residual paints, solvents, lumber, and other materials to the maximum extent practical.
- Buy recycled products to the maximum extent practical.
- Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.

CASQA California Stormwater Quality Association

- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.

Suggested Protocols

Repair & Remodeling

- Follow BMPs identified in Construction BMP Handbook.
- Maintain good housekeeping practices while work is underway.
- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Cover materials of particular concern that must be left outside, particularly during the rainy season.
- Do not dump waste liquids down the storm drain.
- Dispose of wash water, sweepings, and sediments properly.
- Store materials properly that are normally used in repair and remodeling such as paints and solvents.
- Sweep out the gutter or wash the gutter and trap the particles at the outlet of the downspout if when repairing roofs, small particles have accumulated in the gutter. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- Properly store and dispose waste materials generated from construction activities. See Construction BMP Handbook.
- Clean the storm drain system in the immediate vicinity of the construction activity after it is completed.

Painting

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100% effective.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.

- Do not transfer or load paint near storm drain inlets.
- Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is significant risk of a spill reaching storm drains.
- Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose the residue properly.
- Cover or enclose painting operations properly to avoid drift.
- Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- Capture all cleanup-water and dispose of properly.
- Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

Training

Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.

Limitations

- This BMP is for minor construction only. The State's General Construction Activity Stormwater Permit has more requirements for larger projects. The companion "Construction Best Management Practice Handbook" contains specific guidance and best management practices for larger-scale projects.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.

SC-42 Building Repair and Construction

Requirements

Costs

These BMPs are generally low to modest in cost.

Maintenance

N/A

Supplemental Information

Further Detail of the BMP

Soil/Erosion Control

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective "in-line" treatment devices. See Treatment Control Fact Sheet TC-20 Wet Pond/Basin in Section 5 of the New Development and Redevelopment Handbook regarding design criteria. Include in the catch basin a "turn-down" elbow or similar device to trap floatables.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

IC3. BUILDING MAINTENANCE

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Properly collect and dispose of water when pressure washing buildings, rooftops, and other large objects.
- Properly prepare work area before conducting building maintenance.
- Properly clean and dispose of equipment and wastes used and generated during building maintenance.
- Store toxic material under cover when not in use and during precipitation events.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	
Metals	x
Bacteria	x
Oil & Grease	
Organics & Toxicants	
Pesticides	
Oxygen Demanding	

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Properly collect and dispose of water when pressure washing buildings, rooftops, and other large objects.
    - If pressure washing where the surrounding area is paved, use a water collection device that enables collection of wash water and associated solids. Use a sump pump, wet vacuum or similarly effective device to collect the runoff and loose materials. Dispose of the collected runoff and solids properly. Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wash water to the sanitary sewer.
    - If pressure washing on a landscaped area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the landscaping and not drain to pavement.
2. Properly prepare work area before conducting building maintenance.
    - Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
    - Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

3. Properly clean and dispose of equipment and wastes used and generated during building maintenance.
    - Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
    - Properly dispose of wash water, sweepings, and sediments.
    - Properly store equipment, chemicals, and wastes.
    - Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.

    OPTIONAL:
    - Recycle residual paints, solvents, lumber, and other materials to the maximum extent practicable
4. Employ soil erosion and stabilization techniques when exposing large areas of soil.
    - Confine excavated materials to pervious surfaces away from storm drain inlets, sidewalks, pavement, and ditches. Material must be covered if rain is expected.
    - Use chemical stabilization or geosynthetics to stabilize bare ground surfaces.
5. Store toxic material under cover when not in use and during precipitation events.
6. Properly dispose of fluids from air conditioning, cooling tower, and condensate drains.
7. Regularly inspect air emission control equipment under AQMD permit.
8. Switch to non-toxic chemicals for maintenance when possible.
    - If cleaning agents are used, select biodegradable products whenever feasible
    - Consider using a waterless and non-toxic chemical cleaning method for graffiti removal (e.g. gels or spray compounds).
9. Use chemicals that can be recycled.
    - Buy recycled products to the maximum extent practicable

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.
3. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
4. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. www.cabmphandbooks.com

California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser& McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. King County Surface Water Management. July 1995. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

For additional information contact:

County of Orange/ OC Watersheds
Main: (714) 955-0600
24 hr Water Pollution Hotline: 1-877-89-SPILL
or visit our website at www.ocwatersheds.com

IC7. LANDSCAPE MAINTENANCE

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Properly store and dispose of gardening wastes.
- Use mulch or other erosion control measures on exposed soils.
- Properly manage irrigation and runoff.
- Properly store and dispose of chemicals.
- Properly manage pesticide and herbicide use.
- Properly manage fertilizer use.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	
Bacteria	x
Oil & Grease	
Organics & Toxicants	
Pesticides	x
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Take steps to reduce landscape maintenance requirements.
    - Where feasible, retain and/or plant native vegetation with features that are determined to be beneficial. Native vegetation usually requires less maintenance than planting new vegetation.
    - When planting or replanting consider using low water use flowers, trees, shrubs, and groundcovers.
    - Consider alternative landscaping techniques such as naturescaping and xeriscaping.
2. Properly store and dispose of gardening wastes.
    - Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage at a permitted landfill or by composting.
    - Do not dispose of gardening wastes in streets, waterways, or storm drainage systems.
    - Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm and/or cover.
3. Use mulch or other erosion control measures on exposed soils.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

4. Properly manage irrigation and runoff.
    - Irrigate slowly or pulse irrigate so the infiltration rate of the soil is not exceeded.
    - Inspect irrigation system regularly for leaks and to ensure that excessive runoff is not occurring.
    - If re-claimed water is used for irrigation, ensure that there is no runoff from the landscaped area(s).
    - If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
    - Use automatic timers to minimize runoff.
    - Use popup sprinkler heads in areas with a lot of activity or where pipes may be broken. Consider the use of mechanisms that reduce water flow to broken sprinkler heads.
5. Properly store and dispose of chemicals.
    - Implement storage requirements for pesticide products with guidance from the local fire department and/or County Agricultural Commissioner.
    - Provide secondary containment for chemical storage.
    - Dispose of empty containers according to the instructions on the container label.
    - Triple rinse containers and use rinse water as product.
6. Properly manage pesticide and herbicide use.
    - Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of pesticides and herbicides and training of applicators and pest control advisors.
    - Follow manufacturers' recommendations and label directions.
    - Use pesticides only if there is an actual pest problem (not on a regular preventative schedule). When applicable use less toxic pesticides that will do the job. Avoid use of copper-based pesticides if possible. Use the minimum amount of chemicals needed for the job.
    - Do not apply pesticides if rain is expected or if wind speeds are above 5 mph.
    - Do not mix or prepare pesticides for application near storm drains. Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the targeted pest.
    - Whenever possible, use mechanical methods of vegetation removal rather than applying herbicides. Use hand weeding where practical.
    - Do not apply any chemicals directly to surface waters, unless the application is approved and permitted by the state. Do not spray pesticides within 100 feet of open waters.
    - Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
    - When conducting mechanical or manual weed control, avoid loosening the soil, which could lead to erosion.
    - Purchase only the amount of pesticide that you can reasonably use in a given time period.
    - Careful soil mixing and layering techniques using a topsoil mix or composted organic material can be used as an effective measure to reduce herbicide use and watering.
7. Properly manage fertilizer use.
    - Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers.
    - Follow manufacturers' recommendations and label directions.
    - Employ techniques to minimize off-target application (e.g. spray drift) of fertilizer, including consideration of alternative application techniques. Calibrate fertilizer distributors to avoid excessive application.
    - Periodically test soils for determining proper fertilizer use.
    - Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
    - Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
    - Use slow release fertilizers whenever possible to minimize leaching

8. Incorporate the following integrated pest management techniques where appropriate:
    - Mulching can be used to prevent weeds where turf is absent.
    - Remove insects by hand and place in soapy water or vegetable oil. Alternatively, remove insects with water or vacuum them off the plants.
    - Use species-specific traps (e.g. pheromone-based traps or colored sticky cards).
    - Sprinkle the ground surface with abrasive diatomaceous earth to prevent infestations by soft-bodied insects and slugs. Slugs also can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
    - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
    - Small mammals and birds can be excluded using fences, netting, and tree trunk guards.
    - Promote beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seedhead weevils, and spiders that prey on detrimental pest species.

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Educate and train employees on the use of pesticides and pesticide application techniques. Only employees properly trained to use pesticides can apply them.
3. Train and encourage employees to use integrated pest management techniques.
4. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.
5. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
6. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. www.cabmphandbooks.com

California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser& McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. King County Surface Water Management. July 1995. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

Water Quality Handbook for Nurseries. Oklahoma Cooperative Extension Service. Division of Agricultural Sciences and Natural Resources. Oklahoma State University. E-951. September 1999.

For additional information contact:

County of Orange/ OC Watersheds
Main: (714) 955-0600
24 hr Water Pollution Hotline: 1-877-89-SPILL
or visit our website at www.ocwatersheds.com

IC15. PARKING AND STORAGE AREA MAINTENANCE

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Conduct regular cleaning.
- Properly collect and dispose of wash water.
- Keep the parking and storage areas clean and orderly.
- Use absorbent materials and properly dispose of them when cleaning heavy oily deposits.
- When conducting surface repair work cover materials and clean paintbrushes and tools appropriately.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	x
Bacteria	x
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Conduct regular cleaning.
    - Sweeping or vacuuming the parking facility is encouraged over other methods.
    - Sweep all parking lots at least once before the onset of the wet season.
    - Establish frequency of sweeping based on usage and field observations of waste accumulation.
2. Properly collect and dispose of wash water.
    - Block the storm drain or contain runoff.
    - Wash water should be collected and pumped to the sanitary sewer or discharged to a pervious surface, do not allow wash water to enter storm drains. Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wash water to the sanitary sewer.
    - Dispose of parking lot sweeping debris and dirt at a landfill.
3. Consider use of source treatment BMPs to treat runoff.
    - Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
    - Utilize sand filters or oleophilic collectors for oily waste in low quantities.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

4. Keep the parking and storage areas clean and orderly.
    - Clean out and cover litter receptacles frequently to prevent spillage.
    - Remove debris in a timely fashion.

    OPTIONAL:
    - Post "No Littering" signs.
5. When cleaning heavy oily deposits:
    - If possible, clean oily spots with absorbent materials.
    - Do not allow discharges to the storm drain.
    - Appropriately dispose of spilled materials and absorbents.
6. When conducting surface repair work:
    - Pre-heat, transfer or load hot bituminous material away from storm drain inlets.
    - Conduct surface repair work during dry weather to prevent contamination from contacting stormwater runoff.
    - Cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and clean any debris for proper disposal.
    - To avoid runoff, use only as much water as necessary for dust control.
    - Use drip pans or absorbent material to catch drips from paving equipment that is not in use. Dispose of collected material and absorbents properly.
7. Conduct inspections on a regular basis.
    - Designate personnel to conduct inspections of the parking facilities and stormwater conveyance systems associated with them.
    - Inspect cleaning equipment/sweepers for leaks on a regular basis.
8. Keep accurate maintenance logs to evaluate materials removed/stored and improvements made.
9. Arrange rooftop drains to prevent drainage directly onto paved surfaces.

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.
3. Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. www.cabmphandbooks.com

California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser& McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. King County Surface Water Management. July 1995. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

For additional information contact:

County of Orange/ OC Watersheds
Main: (714) 955-0600
24 hr Water Pollution Hotline: 1-877-89-SPILL
or visit our website at www.ocwatersheds.com

IC17. SPILL PREVENTION AND CLEANUP

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Develop procedures to prevent/mitigate spills to storm drain systems.
- Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal.
- Conduct routine cleaning, inspections, and maintenance.
- Properly store and handle chemical materials.
- Protect materials stored outside from stormwater runon.
- Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- Identify key spill response personnel.
- Clean up leaks and spills immediately.
- Report and track spills.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	x
Bacteria	x
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

Spill Prevention

1. Develop procedures to prevent/mitigate spills to storm drain systems.
   Standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
2. Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal.
3. Conduct routine cleaning, inspections, and maintenance
   - Sweep and clean storage areas consistently at a designated frequency (e.g. weekly, monthly). DO NOT hose down areas to storm drains.
   - Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Reuse, recycle, or properly dispose of any collected liquids or soiled absorbent materials.
   - Check tanks (and any containment sumps) frequently for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

- Check for external corrosion of material containers, structural failures, spills and overfills due to operator error, failure of piping system, etc.
- Inspect tank foundations, connections, coatings, and tank walls and piping system.

4. Properly store and handle chemical materials.
    - Designate a secure material storage area that is paved with Portland cement concrete, free of cracks and gaps, and impervious in order to contain leaks and spills.
    - Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containers.
    - Keep chemicals in their original containers, if feasible.
    - Keep containers well labeled according to their contents (e.g., solvent, gasoline).
    - Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
    - Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
5. Utilize secondary containment systems for liquid materials.
    - Surround storage tanks with a berm or other secondary containment system.
    - Slope the area inside the berm to a drain.
    - Drain liquids to the sanitary sewer if available. DO NOT discharge wash water to sanitary sewer until contacting the local sewer authority to find out if pretreatment is required
    - Pass accumulated stormwater in petroleum storage areas through an oil/water separator.
    - Use catch basin filtration inserts.
6. Protect materials stored outside from stormwater runon. Construct a berm around the perimeter of the material storage area to prevent the runon of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the material.
7. Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.

Spill Control and Cleanup Activities

8. Identify key spill response personnel.
9. Adopt the Orange County Hazardous Materials Area Plan or an equivalent plan, which includes a set of planned responses to hazardous materials emergencies. The plan should include:
    - Description of the facility, owner and address, activities and chemicals present
    - Facility map
    - Notification and evacuation procedures
    - Cleanup instructions
    - Identification of responsible departments
10. Clean up leaks and spills immediately.
    - Place a stockpile of spill cleanup materials where they will be readily accessible (e.g. near storage and maintenance areas).
    - Utilize dry cleaning methods to clean up spills to minimize the use of water. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use brooms, shovels, sweepers, or plows.
    - Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
    - Clean up chemical materials with absorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
    - For larger spills, a private spill cleanup company or Hazmat team may be necessary.

11. Reporting
    1. Report spills that pose an immediate threat to human health or the environment to local agencies, such as the fire department, and the Regional Water Quality Control Board.
    2. Establish a system for tracking incidents. The system should be designed to identify the following:
        - Types and quantities (in some cases) of wastes
        - Patterns in time of occurrence (time of day/night, month, or year)
        - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
        - Responsible parties
    3. Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).

Training
1. Educate employees about spill prevention and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Educate employees on aboveground storage tank requirements.
    - Train all employees upon hiring and conduct annual refresher training.
2. Train employees responsible for aboveground storage tanks and liquid transfers on the Spill Prevention Control and Countermeasure Plan.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. www.cabmphandbooks.com

California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser& McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

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IC21. WASTE HANDLING AND DISPOSAL

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Prevent waste materials from coming in direct contact with wind or rain. .
- Keep waste collection areas clean.
- Secure solid waste containers when not in use.
- Regularly inspect, repair, and/or replace waste containers.
- Use all of a product before disposing of the container.
- Label and store hazardous wastes according to hazardous waste regulations.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	x
Bacteria	x
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Prevent waste materials from coming in direct contact with wind or rain.
    - Cover the waste management area with a permanent roof.
    - If this is not feasible, cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene, or hypalon.
    - Cover dumpsters to prevent rain from washing out waste materials.
2. Design waste handling and disposal area to prevent stormwater runon.
    - Enclose the waste handling and disposal area or build a berm around it.
    - Position roof downspouts to direct stormwater away from waste handling and disposal area.
3. Design waste handling and disposal area to contain spills.
    - Place dumpsters or other waste receptacles on an impervious surface.
    - Construct a berm around the area to contain spills.
    - Install drains connected to the public sewer or the facility's process wastewater system within these contained areas. DO NOT discharge to a public sewer until contacting the local sewer authority to find out if pretreatment is required.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

4. Keep waste collection areas clean.
    - When cleaning around waste handling and disposal areas use dry methods when possible (e.g. sweeping, use of absorbents).
    - If water must be used, collect water and discharge to the sewer if permitted to do so. DO NOT discharge to a public sewer until contacting the local sewer authority to find out if pretreatment is required. If discharge to the sanitary sewer is not allowed, pump water to a tank and dispose of properly.
    - Post "No Littering" signs.
5. Secure solid waste containers when not in use.
6. Regularly inspect, repair, and/or replace waste containers.
7. Do not fill waste containers with washout water or any other liquid.
8. Use all of a product before disposing of the container.
9. Segregate wastes by type and label and date wastes.
    - Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.
    - Ensure that only appropriate solid wastes are added to solid waste containers.
    - Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be disposed of in solid waste containers.
10. Label and store hazardous wastes according to hazardous waste regulations.
    - Consult your local hazardous waste agency or Fire Department for details.
    - Obtain a hazardous waste generator license or permit if necessary.
12. Minimize waste.
    - Recycle materials whenever possible.
    - Modify processes or equipment to increase efficiency.
    - Identify and promote use of non-hazardous alternatives.
    - Reduction in the amount of waste generated can be accomplished using many different types of source controls such as:
        - Production planning and sequencing
        - Process or equipment modification
        - Raw material substitution or elimination
        - Loss prevention and housekeeping
        - Waste segregation and separation
        - Close loop recycling
    - Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Train employees in proper waste handling and disposal.
3. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.

4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read “No Dumping Drains to Ocean”.

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. www.cabmphandbooks.com

California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser& McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

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IC22. EATING AND DRINKING ESTABLISHMENTS

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Use dry cleaning methods instead of water
- Clean equipment (floor mats, grease filters, grills, garbage cans, etc.) indoors or in a covered outdoor wash area that is plumbed to the sanitary sewer or in an area that will contain the wash water (Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wash water to the sanitary sewer).
- Recycle and/or properly dispose of grease and oil.
- Block the storm drain when hosing or steam/pressure washing outside dumpster areas, sidewalks, and common areas.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	
Nutrients	x
Floatable Materials	x
Metals	
Bacteria	x
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Practice good housekeeping.
    - Conduct regular sweeping or vacuuming of outdoor areas: Dry sweep pavement areas including "drive-thru" areas, parking lots, sidewalks, outdoor eating areas and dumpster storage areas frequently.
    - Keep outside areas free of trash & debris.
    - Do not hose out dumpsters or fill them with liquid waste.
    - Regularly inspect, repair, and/or replace dumpsters.
2. Clean equipment (floor mats, grease filters, grills, garbage cans, etc.) indoors or in a covered outdoor wash area that is plumbed to the sanitary sewer.
    - Clean equipment in a mop sink if possible (never in a food preparation sink). If there is no mop sink, dedicate an indoor cleaning area where a drain is plumbed to the sanitary sewer.
    - Dispose mop water from cleaning floors in a mop sink, toilet or other drain that is plumbed to the sanitary sewer. Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wash water to the sanitary sewer.
    - Do not pour wash water outside or into a street, gutter, or storm drain.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

- Dispose of all wastewater containing oil and grease in a grease trap or interceptor.

3. Recycle and/or properly dispose of grease and oil. Collect and dispose of concentrated waste oil and grease and disposed of by a certified waste grease hauler. NEVER pour grease or oil into a sink, floor drain, storm drain or dumpster.
4. Block storm drain(s) when cleaning (hosing or steam/pressure washing) outside dumpster areas, sidewalks, and common areas with hot water, soap, or other cleaning agent. Collect water/waste and discharge to the sanitary sewer (with approval of the local sanitation district).

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.
3. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
4. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. www.cabmphandbooks.com

Carlsbad Jurisdictional Urban Runoff Management Plan. Best Management Practices for Restaurants. City of Carlsbad. February 2002. On-line: http://www.ci.carlsbad.ca.us/cserv/jurmp.html

Orange County Stormwater Program. 2001. Water Quality Guidelines for Exterior Restaurant Cleaning Operations. Brochure. June.

Orange County Stormwater Program. Good Cleaning Practices Food & Restaurant Industry. Poster. Courtesy of the City and County of LA.

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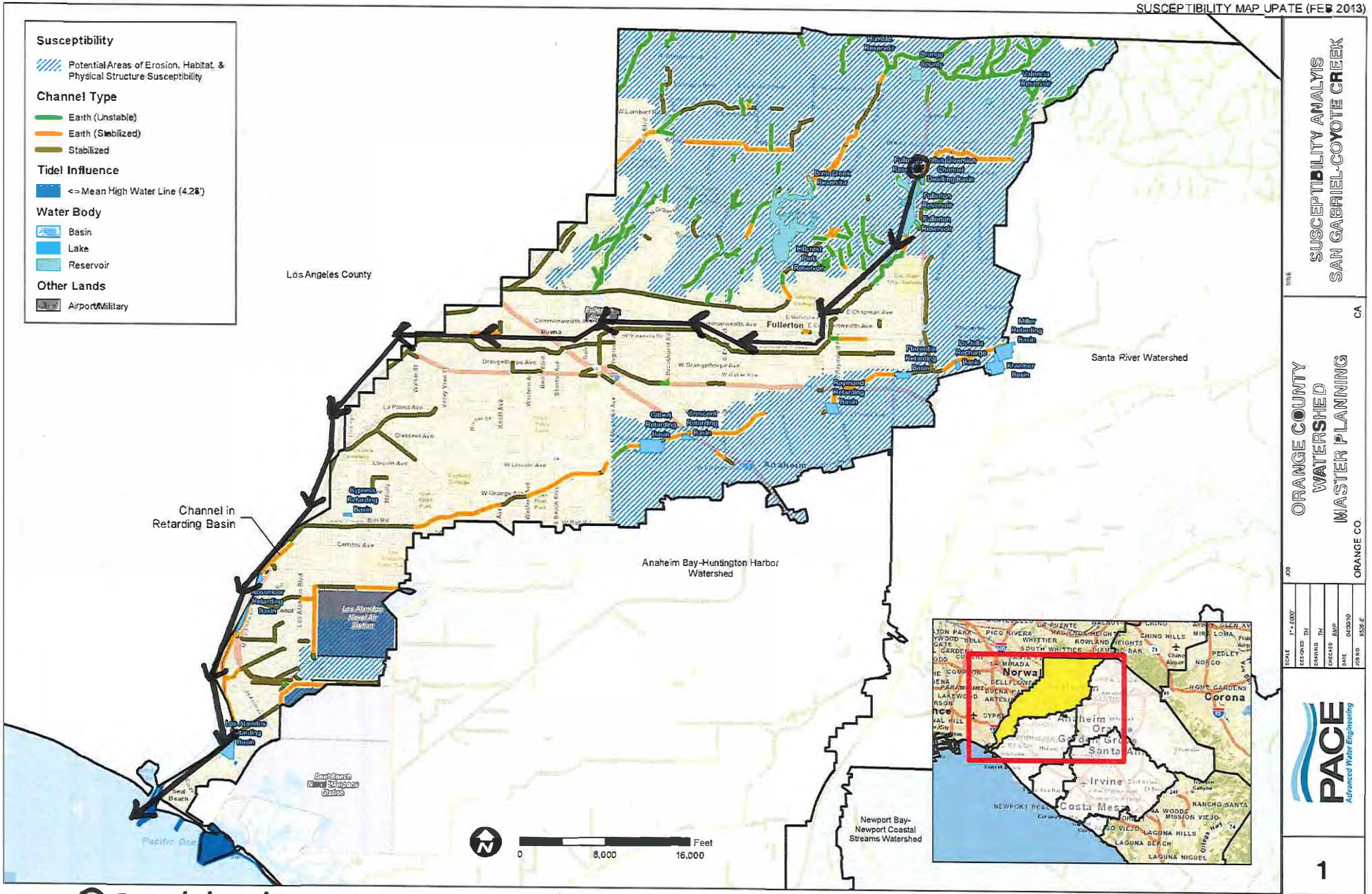
APPENDIX C

SUSCEPTIBILITY ANALYSIS MAP FOR SAN GABRIEL-COYOTE CREEK WATERSHED

SUSCEPTIBILITY MAP UPATE (FEB 2013)



SUSCEPTIBILITY ANALYSIS
SAN GABRIEL-COYOTE CREEK

ORANGE COUNTY WATERSHED MASTER PLANNING

ORANGE CO CA

PACE Advanced Water Engineering

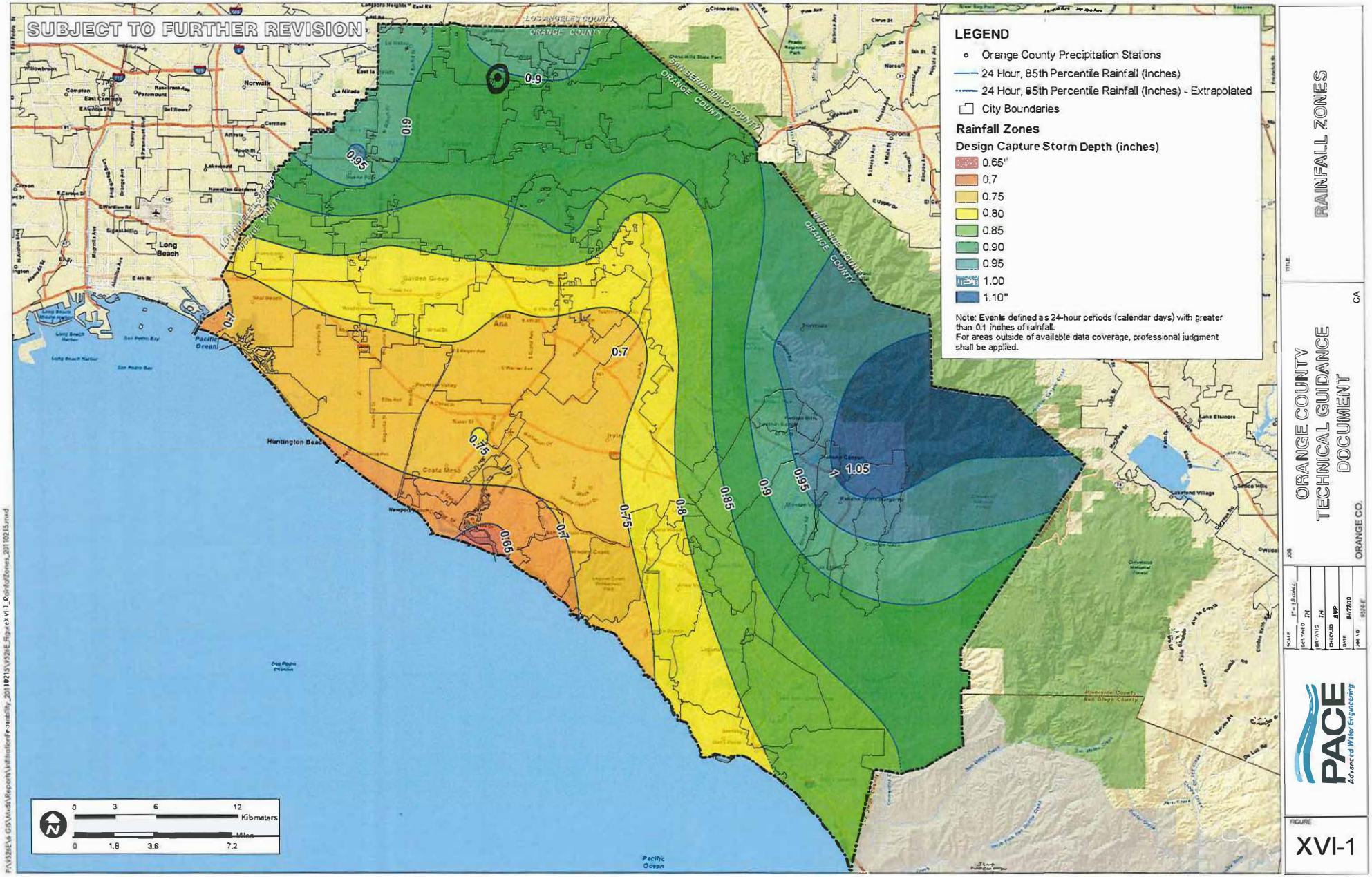
1

Project Location: 1639 E. Imperial Hwy, Brea, CA 92821

Drainage Flow From Project Site to Pacific Ocean

APPENDIX D

RAINFALL ZONE MAP FOR ORANGE COUNTY



Project Location: 1639 E. Imperial Hwy., Brea, CA 92821

APPENDIX E

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.'S

GEOTECHNICAL FEASIBILITY STUDY, PROPOSED BREA PLAZA MIXED USE DEVELOPMENT, NWC IMPERIAL HIGHWAY AT ASSOCIATED ROAD, BREA, CALIFORNIA, DATED JULY 30, 2020

GEOTECHNICAL FEASIBILITY STUDY
PROPOSED BREA PLAZA
MIXED USE DEVELOPMENT

NWC Imperial Highway at Associated Road
Brea, California
For
BOSC Realty Advisors

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

July 30, 2020

BOSC Realty Advisors
888 W. Big Beaver Road, Suite 200
Troy, Michigan 48084

Attention: Mr. Waad J. Nadhir

Project No.: 20G168-1

Subject: Geotechnical Feasibility Study
Proposed Brea Plaza Mixed Use Development
NWC Imperial Highway at Associated Road
Brea, California

Gentlemen:

In accordance with your request, we have conducted a geotechnical feasibility study at the subject site. We are pleased to present this report summarizing the conclusions and recommendations developed from our investigation.

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

Gregory K. Mitchell, GE 2364
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
GREGORY K. MITCHELL
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Robert G. Trazo, M.Sc., GE 2655
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ROBERT TRAZO
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Distribution: (1) Addressee

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C Laboratory Test Results
D Grading Guide Specifications
E Seismic Design Parameters
F Excerpts from Previous Geotechnical Reports

1.0 EXECUTIVE SUMMARY

Presented below is a brief summary of the conclusions and recommendations of this investigation. Since this summary is not all inclusive, it should be read in complete context with the entire report. It should be noted that this investigation was focused on determining the geotechnical feasibility of the proposed development. This report is not a design-level investigation. Future studies, potentially including additional subsurface exploration, will be necessary to refine the preliminary design parameters that are presented within this report.

Geotechnical Design Considerations

- Undocumented fill soils at borings drilled within the development area extend to depths of 5 to 10± feet below the existing site grades. The existing fill soils possess variable composition and strength, and are considered to represent undocumented fill. The results of laboratory testing indicate that some of the near-surface soils are compressible when loaded.
- The fill soils are underlain by high strength native terrace deposits.
- The proposed development is considered to be feasible with respect to the geotechnical conditions encountered at the boring locations at the site. The proposed structures will have relatively high column loads. The most feasible means of supporting the new structures is considered to be the use of shallow foundations supported within the terrace deposits. In any areas where the foundations do not extend into the terrace deposits, remedial grading will be necessary to remove and replace the existing undocumented fill soils.
- The proposed development includes two sections of office building that will be constructed over existing retail buildings. These structures will likely require deep foundations to reduce the impact to the existing retail tenants, and to avoid surcharging the foundations of the existing buildings.
- Based on the results of corrosivity testing, the on-site soils are considered to be corrosive to ductile iron and cast iron pipe.

Preliminary Site Preparation Recommendations

- Demolition of several structures associated with the existing development and areas of existing pavements will be required in order to facilitate construction of the new buildings. Debris resultant from demolition should be disposed of off-site. Alternatively, concrete and asphalt debris may be pulverized to a maximum 2-inch particle size, well mixed with the on-site soils, and incorporated into new structural fills or it may be crushed and made into crushed miscellaneous base (CMB).
- Preliminarily, the overexcavation within the building areas is recommended to extend to depths of at least 2 to 3 feet below existing and proposed building pad subgrade elevations, to provide a suitable floor slab subgrade. No specific overexcavation is expected to be necessary where foundations extend into the terrace deposits. Where foundations are not extended into the terrace deposits, overexcavation should be performed to remove all of the existing undocumented fill soils, and to a depth of at least 3 to 5 feet below bearing grade within the influence zones of any new foundations. These recommendations are subject to review and may be revised based on the results of the design-level geotechnical investigation.
- Preliminarily, the new parking area subgrade soils are recommended to be scarified to a depth of 12± inches, thoroughly moisture conditioned to within 2 to 4 percent above the optimum

moisture content and recompacted to at least 90 percent of the ASTM D-1557 maximum dry density.

Preliminary Foundation Design Recommendations

- Conventional shallow foundations, supported in newly placed compacted fill.
- 4,000 to 5,000 lbs/ft^2 maximum allowable soil bearing pressure for footings supported in dense to very dense terrace deposits.
- 2,500 to 3,000 lbs/ft^2 maximum allowable soil bearing pressure for footings supported in structural fill.
- The design of the foundations will depend on the results of the future design-level geotechnical study. Minimum recommended reinforcement based on geotechnical conditions is expected to consist of four (4) No. 5 rebars (2 top and 2 bottom) in strip footings. Additional reinforcement may be necessary for structural considerations.

Preliminary Floor Slab Design Recommendations

- Conventional slabs-on-grade, minimum 5 to 6 inches thick.
- Steel reinforcement is expected to be necessary, based on the presence of expansive soils.
- The design of the floor slabs will depend on the results of the future design-level geotechnical study. The actual thickness and reinforcement of the floor slabs should be determined by the structural engineer.

Preliminary Pavement Design Recommendations

ASPHALT PAVEMENTS (R = 10)				
Materials	Thickness (inches)			
	Auto Parking (TI = 4.0)	Auto Drive Lanes (TI = 5.0)	Truck Traffic	
			(TI = 6.0)	(TI = 7.0)
Asphalt Concrete	3	3	3½	4
Aggregate Base	6	9	11	15
Compacted Subgrade	12	12	12	12

PORTLAND CEMENT CONCRETE PAVEMENTS (R = 10)			
Materials	Thickness (inches)		
	Auto Parking & Drives (TI = 5.0)	Truck Traffic	
		(TI = 6.0)	(TI = 7.0)
PCC	5	5½	6
Compacted Subgrade (95% Relative Compaction)	12	12	12

2.0 SCOPE OF SERVICES

The scope of services performed for this project was in general accordance with our Proposal No. 20P269, dated June 29, 2020. The scope of services included a visual site reconnaissance, subsurface exploration, field and laboratory geotechnical testing, and geotechnical engineering analysis to determine the geotechnical feasibility of the proposed development. This report also contains preliminary design criteria for building foundations, building floor slabs, and parking lot pavements. The evaluation of the environmental aspects of this site was beyond the scope of services for this feasibility study.

It should be noted that additional subsurface exploration, laboratory testing and engineering analysis will be necessary to provide a design-level geotechnical report, with specific foundation, floor slab, and grading recommendations for the new structures.

3.0 SITE AND PROJECT DESCRIPTION

3.1 Site Conditions

Brea Plaza Center is located at the northwest corner of Imperial Highway and Associated Road, in Brea, California. The overall site is bounded to the north by existing single-family residences, to the west by the 57 freeway, to the south by Imperial Highway, and to the east by Associated Road. The general location of the site is illustrated on the Site Location Map, enclosed as Plate 1 in Appendix A of this report.

Brea Plaza is a retail shopping center, approximately 15 acres in size. The specific subject site is a roughly L-shaped area, 2.7± acres in size, located in the western region of Brea Plaza, adjacent to the 57 Freeway. The subject site is presently developed with a Buca de Beppo restaurant, a Custom Comfort Mattress store, a movie theater, and a multi-tenant retail building. The remainder of the subject site is covered by asphaltic concrete (AC) pavements that are used for automobile and truck parking and drive lanes. Limited areas of the subject site are paved with Portland cement concrete (PCC) pavements. Concrete flatwork and landscaped planters are located throughout the existing development. The remaining areas of the Brea Plaza Center are developed with similar retail and restaurant buildings and AC pavements.

Topographic information for the site was obtained from a site plan provided by Architects Orange. The site topography slopes from the northwest corner towards the southeast. The elevation at the subject site generally ranges from 336± feet mean sea level (msl) in the northern region of the subject site to 329± feet msl in the southern region.

3.2 Proposed Development

A preliminary site plan was provided to our office by the client. The site will be developed with several new structures including a hotel, residential apartments, a restaurant, a self-storage building and an office building. The hotel will be located in the southwestern region of the site, will have a footprint of 15,000 to 20,000± ft² and will be 6 stories in height. The restaurant will be incorporated into the first story of the hotel. The apartment building will be located in the northern region of the site, and will have a footprint of 45,000± ft². This building will be a total of 7 stories in height, with the lower two levels consisting of a parking structure. The self-storage facility will be incorporated into the residential building. Two areas of new offices will be constructed over portions of the existing multi-tenant retail building and the Custom Comfort Mattress store. The office building will be 3 stories in height, with a footprint of 8,000± ft². The existing movie theater and Buco de Beppo restaurant will be demolished as part of the redevelopment. The buildings will be surrounded by asphaltic concrete or Portland cement concrete pavements for automobile parking and drive lanes. The proposed development is also expected to include some areas of concrete flatwork and landscape planters.

Preliminary structural information was obtained from the project structural engineer, Ficcadenti, Waggoner and Castle (FWC). We understand that the first floor of the hotel structure will consist

of a concrete podium below 5 levels of wood-frame construction. The residential building will be 2 levels of concrete podium and 5 levels of wood frame construction. The two sections of office building will consist of steel frame construction. New foundations will be required within the existing multi-tenant retail building that will remain in place below the new office building. Preliminary information provided by FWC indicates that typical maximum column loads for the proposed structures will be as follows:

ESTIMATED COLUMN LOADS

Structure	Dead Load	Sustained Live Load	Transient Live Load
Residential Building	625 kips	45 kips	180 kips
Hotel Building	475 kips	35 kips	140 kips
Office Building	350 kips	60 kips	90 kips

FWC has indicated that some isolated foundations may have slightly higher loads.

No significant amounts of below-grade construction, such as basements or crawl spaces, are expected to be included in the proposed development. Based on the assumed topography, cuts and fills of up to 3 to 6± feet are expected to be necessary to achieve the proposed site grades.

3.3 Previous Studies

Southern California Geotechnical, Inc. (SCG) was provided with a copy of a previous study conducted for the overall site by Pacific Soils Engineering (PSE). This document was prepared for storm drain improvements that have since been constructed in the eastern region of the Brea Plaza site. The report also included a summary of data collected during previous investigations at the site. A summary of the relevant information pertaining to the subject site from this document is presented below:

> Preliminary Geotechnical Investigation, Proposed Storm Drain Improvements for the Loftus Diversion Channel and the Brea Plaza Shopping Center, Northwest Corner of Imperial Highway and Associated Road, City of Brea, California, Prepared by Pacific Soils Engineering, Inc., dated March 26, 2008, Work Order 500690.

The overall subsurface exploration for this project consisted of thirteen (13) borings and ten (10) cone penetration tests. Boring Nos. HS-03, HS-04, HS-05, and HS-07, as well as CPT Nos. CPT-1, CPT-3, and CPT-4 were within the area of the specific subject site and will be the focus of this summary. The borings were advanced to depths of up to 21½ to 31½± feet below the existing site grades. Engineered fill soils were reportedly encountered beneath the pavements at several of the boring locations. It should be noted that PSE did not provide any documentation to confirm that the existing fill soils were monitored and tested during placement. The fill soils extended to depths of up to 2 to 10± feet below grade at these boring locations, and generally consisted of medium dense to dense medium dense to dense clayey sand, silty sand and sandy clay. Beneath the fill materials, all of the borings encountered terrace deposits, extending to at least the maximum depth explored of 31± feet. The terrace deposits generally consisted of stiff to hard sandy clay, dense to very dense sandy silt, silty sand, and clayey sand. Occasional layers of

gravelly sand and clayey silt were encountered. The results of expansion index testing performed for this report identified low to highly expansive soils at the boring locations. Ground water was encountered at most borings at depths between 10 and 30± feet (El. 303±). The report also notes that layers of perched groundwater were encountered during the investigation.

In Appendix D of this report, a previous report performed for the subject site was reviewed and summarized:

> Geotechnical Investigation, Proposed Shopping Center, Imperial Highway at Orange Freeway, Brea, California, Prepared by Converse Davis Dixon Associates, dated July 21, 1975, Project No. A-75-587-A.

The exploration for this investigation consisted of 12 borings advanced to depths of 3 to 30± feet below the site grades. The borings were advanced with a truck-mounted, rotary drilling machine equipped with a 16 to 20-inch diameter drilling bucket. Boring Nos. CD BH-3 through CD BH-5 are located within the subject site. Native alluvial soils were encountered at the ground surface of these 3 borings. The near surface alluvium within the upper 6½± feet generally consisted of stiff to very stiff clay and silty clay. Deeper alluvial soils, extending to at least 20± feet below ground surface, generally consisted of medium dense to very dense silty sand, sandy silt and silt. Occasional layers of very stiff/very dense sandy clay and clayey sand were encountered. Swell tests were conducted on Boring Nos. CD BH-3 and CD BH-5, results showed a 9.7 and 7.7 percent swell, respectively. No groundwater was encountered during the drilling of the relevant borings.

The relevant boring logs and lab data from the previous geotechnical reports are included in Appendix F of this report.

4.0 SUBSURFACE EXPLORATION

4.1 Scope of Exploration/Sampling Methods

The subsurface exploration conducted for this project consisted of four (4) borings (identified as Boring Nos. B-1 through B-4) advanced to depths of 25 to 50± feet below the existing site grades. All of the borings were logged during drilling by a member of our staff.

The borings were advanced with hollow-stem augers by a conventional truck-mounted drilling rig. Representative bulk and relatively undisturbed soil samples were taken during drilling. Relatively undisturbed soil samples were taken with a split barrel "Modified California Sampler" containing a series of one inch long, 2.416± inch diameter brass rings. This sampling method is described in ASTM Test Method D-3550. In-situ samples were also taken using a 1.4± inch inside diameter split spoon sampler, in general accordance with ASTM D-1586. At all of the boring locations these samplers are driven into the ground with successive blows of a 140-pound weight falling 30 inches. The blow counts obtained during driving are recorded for further analysis. Bulk samples were collected in plastic bags to retain their original moisture content. The relatively undisturbed ring samples were placed in molded plastic sleeves that were then sealed and transported to our laboratory.

The approximate locations of the borings are indicated on the Boring Location Plan, included as Plate 2 in Appendix A of this report. The Boring Logs, which illustrate the conditions encountered at the boring locations, as well as the results of some of the laboratory testing, are included in Appendix B.

4.2 Geotechnical Conditions

Pavements

Asphaltic concrete pavements were encountered at the ground surface of all boring locations. The pavement sections at these locations generally consists of 3 to 8± inches of AC underlain by 5 to 7± inches of crushed aggregate base.

Artificial Fill

Artificial fill soils were encountered beneath the pavements at Boring Nos. B-2 through B-4, extending to depths of 5½ to 6½± feet below the existing site grades. The artificial fill soils generally consist of medium dense to very dense silty fine sand with trace clay nodules and clayey fine sand, as well as stiff to hard silty clay and fine sandy clay. The fill soils possess a disturbed and mottled appearance with occasional artificial debris content (including fragments of wood, brick and asphaltic concrete) resulting in their classification as artificial fill.

Additional soils classified as possible fill were encountered beneath the pavement at Boring No. B-1 and beneath the fill at Boring No. B-4, extending to depths of 5½ to 8½± feet below ground surface. These soils possess similar characteristics to the fill soils, but lack any obvious indicators of fill such as brick or asphaltic concrete fragments.

Terrace Deposits

Native terrace deposits were encountered beneath the fill and/or possible fill soils at all of the boring locations, extending to at least the maximum depth explored of 50± feet below ground surface. The near surface terrace deposits (within the upper 5½ to 22± feet) generally consist of medium dense to very dense fine sand, silty fine sand and occasionally fine sandy silt. Terrace deposits extending deeper than 22± feet generally consist of very stiff to hard silty clay and fine sandy clay, as well as medium dense to very dense fine sand. Occasional layers of medium dense to dense clayey silt and silty fine sand were encountered. Trace to some calcareous nodules were observed in some of the terrace deposits. Boring No. B-1 encountered a fine to coarse sand layer at depths of 17 to 25± feet.

Groundwater

Free water was encountered during the drilling of all boring locations, at depths of 22½ to 23½± feet. A delayed groundwater level reading was taken at Boring No. B-2, 3± hours after the completion of the boring. At this boring location, water was present at a depth of 22½± feet below ground surface during the final measurement. Based on the moisture contents of the recovered soil samples and the delayed water measurements taken within the open boreholes, the static groundwater table is considered to have been present at depths of 22½± feet below the existing site grades at the time of the subsurface investigation.

As part of our research, we reviewed readily available groundwater data in order to determine regional groundwater depths. Recent water level data was obtained from the California State Water Resources Control Board, GeoTracker, website, http://geotracker.waterboards.ca.gov/. The nearest monitoring well on record is located approximately 475 feet southeast of the site. Water level readings within this monitoring well indicate a high groundwater level of 18± feet below the ground surface, in December 2011.

The Seismic Hazard Zone Report for the La Habra Quadrangle (SHZR 09), published by the California Geological Survey (CGS), includes a map of historic high groundwater depths. This map indicates a historic high water depth of 10 to 20 feet below grade in the vicinity of the subject site

5.0 LABORATORY TESTING

The soil samples recovered from the subsurface exploration were returned to our laboratory for further testing to determine selected physical and engineering properties of the soils. The tests are briefly discussed below. It should be noted that the test results are specific to the actual samples tested, and variations could be expected at other locations and depths.

Classification

All recovered soil samples were classified using the Unified Soil Classification System (USCS), in accordance with ASTM D-2488. The field identifications were then supplemented with additional visual classifications and/or by laboratory testing. The USCS classifications are shown on the Boring Logs and are periodically referenced throughout this report.

Dry Density and Moisture Content

The density has been determined for selected relatively undisturbed ring samples. These densities were determined in general accordance with the method presented in ASTM D-2937. The results are recorded as dry unit weight in pounds per cubic foot. The moisture contents are determined in accordance with ASTM D-2216, and are expressed as a percentage of the dry weight. These test results are presented on the Boring Logs.

Consolidation

Selected soil samples have been tested to determine their consolidation potential, in accordance with ASTM D-2435. The testing apparatus is designed to accept either natural or remolded samples in a one-inch-high ring, approximately 2.416 inches in diameter. Each sample is then loaded incrementally in a geometric progression and the resulting deflection is recorded at selected time intervals. Porous stones are in contact with the top and bottom of the sample to permit the addition or release of pore water. The samples are typically inundated with water at an intermediate load to determine their potential for collapse or heave. The results of the consolidation testing are plotted on Plates C-1 through C-8 in Appendix C of this report.

Consolidation tests were performed by PSE on several soil samples. The results of tests performed on borings located within the current development area are included in Appendix F of this report.

Maximum Dry Density and Optimum Moisture Content

A representative bulk sample was tested for its maximum dry density and optimum moisture content. The results have been obtained using the Modified Proctor procedure, per ASTM D-1557. These tests are generally used to compare the in-situ densities of undisturbed field samples, and for later compaction testing. Additional testing of other soil type or soil mixes may be necessary at a later date. The results of the testing are plotted on Plate C-9 in Appendix C of this report.

A maximum dry density test was also performed by PSE on a sample of soil from their boring HS-03. This test indicated a maximum dry density of 121.5 lbs/ft^3 and an optimum moisture content of 9.8 percent.

Soluble Sulfates

Representative samples of the near-surface soil were submitted to a subcontracted analytical laboratory for determination of soluble sulfate content. Soluble sulfates are naturally present in soils, and if the concentration is high enough, can result in degradation of concrete which comes into contact with these soils. The results of the soluble sulfate testing are presented below, and are discussed further in a subsequent section of this report.

Sample Identification	Soluble Sulfates (%)	Sulfate Classification
B-1 @ 0 to 5 feet	0.004	Not Applicable (S0)
B-3 @ 0 to 5 feet	0.013	Not Applicable (S0)

Corrosivity Testing

Representative bulk samples of the near-surface soils were submitted to a subcontracted corrosion engineering laboratory to identify potentially corrosive characteristics with respect to common construction materials. The corrosivity testing included a determination of the electrical resistivity, pH, and chloride and nitrate concentrations of the soils, as well as other tests. The results of some of these tests are presented below.

Sample Identification	Saturated Resistivity (ohm-cm)	pH	Chlorides (mg/kg)	Nitrates (mg/kg)
B-1 @ 0 to 5 feet	1,440	7.9	4	6
B-3 @ 0 to 5 feet	1,040	7.7	106	28

Expansion Index

The expansion potential of the on-site soils was determined in general accordance with ASTM D-4829 as required by the California Building Code (CBC). The testing apparatus is designed to accept a 4-inch-diameter, 1-inch high, remolded sample. The sample is initially remolded to 50± 1 percent saturation and then loaded with a surcharge equivalent to 144 pounds per square foot. The sample is then inundated with water, and allowed to swell against the surcharge. The resultant swell or consolidation is recorded after a 24-hour period. The result of the EI testing are as follows:

Sample Identification	Expansion Index	Expansive Potential
B-1 @ 0 to 5 feet	55	Medium
B-3 @ 0 to 5 feet	38	Low
Pacific Soils HS-03	45	Low
Pacific Soils HS-07	46	Low

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our review, field exploration, laboratory testing and geotechnical analysis, the proposed development is considered feasible from a geotechnical standpoint. Based on the preliminary nature of this investigation, further geotechnical investigation may be required prior to construction of the proposed development. The recommendations contained in this report should be taken into the design, construction, and grading considerations. The recommendations are contingent upon all grading and foundation construction activities being monitored by the geotechnical engineer of record.

The Grading Guide Specifications, included as Appendix D, should be considered part of this report, and should be incorporated into the project specifications. The contractor and/or owner of the development should bring to the attention of the geotechnical engineer any conditions that differ from those stated in this report, or which may be detrimental for the development.

6.1 Seismic Design Considerations

The subject site is located in an area which is subject to strong ground motions due to earthquakes. The performance of a site specific seismic hazards analysis was beyond the scope of this investigation. However, numerous faults capable of producing significant ground motions are located near the subject site. Due to economic considerations, it is not generally considered reasonable to design a structure that is not susceptible to earthquake damage. Therefore, significant damage to structures may be unavoidable during large earthquakes. The proposed structures should, however, be designed to resist structural collapse and thereby provide reasonable protection from serious injury, catastrophic property damage and loss of life.

Faulting and Seismicity

Research of available maps indicates that the subject site is not located within an Alquist-Priolo Earthquake Fault Zone. Furthermore, Southern California Geotechnical (SCG) did not identify any evidence of faulting during the geotechnical investigation. Therefore, the possibility of significant fault rupture on the site is considered to be low.

The potential for other geologic hazards such as seismically induced settlement, lateral spreading, tsunamis, inundation, seiches, flooding, and subsidence affecting the site is considered low.

2019 CBC Seismic Design Parameters

Based on the standards in place at the time of this report, we expect that the proposed building will be designed in accordance with the 2019 Edition of the California Building Code (CBC), which was adopted on January 1, 2020. The 2019 CBC Seismic Design Parameters have been generated using the SEAOC/OSHPD Seismic Design Maps Tool, a web-based software application available at the website www.seismicmaps.org. This software application calculates seismic design parameters in accordance with several building code reference documents, including ASCE 7-16, upon which the 2019 CBC is based. The application utilizes a database of risk-targeted maximum considered earthquake (MCE_R) site accelerations at 0.01-degree intervals for each of the code

documents. The table below was created using data obtained from the application. The output generated from this program is included as Plate E-1 of this report. Based on this output, the following parameters may be utilized for the subject site:

The 2019 CBC requires that a site-specific ground motion study be performed in accordance with Section 11.4.8 of ASCE 7-16 for Site Class D sites with a mapped S_1 value greater than 0.2. However, Section 11.4.8 of ASCE 7-16 also indicates an exception from the requirement for a site-specific ground motion hazard analysis for certain structures on Site Class D sites. The commentary for Section 11 of ASCE 7-16 (Page 534 of Section C11 of ASCE 7-16) indicates that "In general, this exception effectively limits the requirements for site-specific hazard analysis to very tall and or flexible structures at Site Class D sites." Based on our understanding of the proposed development, the seismic design parameters presented below were calculated assuming that the exception in Section 11.4.8 applies to the proposed structure at this site. However, the structural engineer should verify that this exception is applicable to the proposed structures. Based on the exception, the spectral response accelerations presented below were calculated using the site coefficients (F_a and F_v) from Tables 11.4-1 and 11.4-2 presented in Section 11.4.4 of ASCE 7-16.

2019 CBC SEISMIC DESIGN PARAMETERS

Parameter		Value
Mapped MCE_R Acceleration at 0.2 sec Period	S_S	1.803
Mapped MCE_R Acceleration at 1.0 sec Period	S_1	0.634
Site Class	---	D
Site Modified Spectral Acceleration at 0.2 sec Period	S_{MS}	1.803
Site Modified Spectral Acceleration at 1.0 sec Period	S_{M1}	1.078
Design Spectral Acceleration at 0.2 sec Period	S_{DS}	1.202
Design Spectral Acceleration at 1.0 sec Period	S_{D1}	0.719

It should be noted that the site coefficient F_v and the parameters S_{M1} and S_{D1} were not included in the SEAOC/OSHPD Seismic Design Maps Tool output for the ASCE 7-16. We calculated these parameters-based on Table 11.4-2 in Section 11.4.4 of ASCE 7-16 using the value of S_1 obtained from the Seismic Design Maps Tool, assuming that a site-specific ground motion hazards analysis is not required for the proposed buildings at this site.

Liquefaction

Liquefaction is the loss of the strength in generally cohesionless, saturated soils when the pore-water pressure induced in the soil by a seismic event becomes equal to or exceeds the overburden pressure. The primary factors which influence the potential for liquefaction include groundwater table elevation, soil type and grain size characteristics, relative density of the soil, initial confining pressure, and intensity and duration of ground shaking. The depth within which the occurrence of liquefaction may impact surface improvements is generally identified as the upper 50 feet below the existing ground surface. Liquefaction potential is greater in saturated, loose, poorly graded fine sands with a mean (d_{50}) grain size in the range of 0.075 to 0.2 mm (Seed and Idriss,

1971). Clayey (cohesive) soils or soils which possess clay particles (d<0.005mm) in excess of 20 percent (Seed and Idriss, 1982) are generally not considered to be susceptible to liquefaction, nor are those soils which are above the historic static groundwater table.

The Earthquake Zones of Required Investigation, La Habra Quadrangle map, published by the California Geological Survey (CGS), indicates that the subject site is not located within a designated liquefaction hazard zone. In addition, the subsurface conditions encountered at the subject site are not considered to be conducive to liquefaction. Based on the conditions encountered at the boring locations, and the mapping performed by the CGS, liquefaction is not considered to be a significant design concern for this project.

6.2 Preliminary Geotechnical Design Considerations

General

Artificial fill soils and possible fill soils were encountered beneath the pavements or at the ground surface at all of the boring locations, extending to depths of 5½ to 8½± feet below the existing site grades. Previous geotechnical investigations identified fill soils extending to depths of up to 10± feet. These fill soils possess variable densities and variable consolidation/collapse characteristics indicating that they do not represent engineered fill soils. Therefore, most of the fill soils encountered at this site are not considered suitable to support the foundation loads of the new structures. It will be necessary to either remove and replace these soils as engineered fill, or extend foundations for the development through these fill soils into the dense terrace deposits below.

The proposed office building will consist of two sections, both of which will be supported over existing retail buildings. We understand that priority is being given to minimizing the impact that construction of these office buildings will have on the tenants of the existing retail buildings. Based on the column loads that will be supported by the office building foundations, some type of deep foundations will likely be necessary to support the structures while providing minimal disturbance to the existing tenants. Preliminary information concerning deep foundation elements is provided in a subsequent section of this report. It is expected that supplemental subsurface exploration will be required in the area of the proposed office building in order to provide more specific deep foundation design data.

Construction of the proposed improvements will require excavation immediately adjacent to existing buildings, pavements, and possibly retaining walls and other miscellaneous site improvements. It is considered likely that shoring and/or slot cutting will be required for portions of the proposed construction. Detailed shoring design parameters can be developed once a specific foundation plan and grading plan have been developed.

Settlement

Based on the recommendations contained in this report, the foundations for the new development will be supported on newly placed compacted structural fill, or extended through any undocumented fill soils into dense to very dense Terrace deposits. Provided that the recommended remedial grading is completed and adequate foundation embedment is utilized,

the post-construction static settlements of the proposed structures are expected to be within tolerable limits.

Soluble Sulfates

The result of the soluble sulfate testing, as discussed in Section 5.0 of this report, indicates that the concentration of soluble sulfates within the selected samples of the on-site soils correspond to Category S0, with respect to the American Concrete Institute (ACI) Publication 318-05 Building Code Requirements for Structural Concrete and Commentary, Section 4.3. Therefore, specialized concrete mix designs are not considered to be necessary, with regard to sulfate protection purposes. It is, however, recommended that additional soluble sulfate testing be conducted at the time of the design-level geotechnical investigation and at the completion of rough grading to verify the soluble sulfate concentrations of the soils which are present at pad grade within the building areas.

Corrosion Potential

The results of laboratory testing indicate that the tested samples of the on-site soils possesses saturated resistivity values of 1,040 and 1,440 ohm-cm, and pH values of 7.7 and 7.9. These test results have been evaluated in accordance with guidelines published by the Ductile Iron Pipe Research Association (DIPRA). The DIPRA guidelines consist of a point system by which characteristics of the soils are used to quantify the corrosivity characteristics of the site. Resistivity and pH are two of the five factors that enter into the evaluation procedure. Redox potential, relative soil moisture content and sulfides are also included. Although sulfide testing was not part of the scope of services for this project, we have evaluated the corrosivity characteristics of the on-site soils using resistivity, pH and moisture content. Based on these factors, and utilizing the DIPRA procedure, the on-site soils are considered to be corrosive to ferrous pipes. Therefore, corrosion protection is expected to be required for cast iron or ductile iron pipes. It should be noted that SCG does not practice in the field of corrosion engineering, and therefore, the client may also wish to contact a corrosion engineer to provide a more thorough evaluation.

Relatively low concentrations (4 and 106 mg/kg) of chlorides were detected in the samples submitted for corrosivity testing. In general, soils possessing chloride concentrations in excess of 500 parts per million (ppm) are considered to be corrosive with respect to steel reinforcement within reinforced concrete. Based on the lack of any significant chlorides in the tested sample, the site is considered to have a C1 chloride exposure in accordance with the American Concrete Institute (ACI) Publication 318 Building Code Requirements for Structural Concrete and Commentary. Therefore, a specialized concrete mix design for reinforced concrete for protection against chloride exposure is not considered warranted. We recommend that additional corrosivity testing be performed at the time of the design-level geotechnical investigation in order to confirm the chloride exposure category.

Expansion

The near-surface soils encountered within the upper 10± feet at this site include interbedded layers of silty sands, sandy clays and silty clays. The result of expansion index testing performed on representative samples of these materials indicate that they possess low to medium expansion potentials (EI = 38 to 55). The preliminary design recommendations contained within this report

are based on the presence of low to medium expansive soils. We recommend that additional expansion index testing be performed at the time of the design-level geotechnical investigation and at the completion of rough grading in order to confirm the expansion potential of the near-surface soils at this site.

Shrinkage/Subsidence

Removal and recompaction of the near-surface fill soils is estimated to result in an average shrinkage of 7 to 12 percent. It should be noted that the potential shrinkage estimate is based on dry density testing performed on small-diameter samples taken at the boring locations. If a more accurate and precise shrinkage estimate is desired, SCG can perform a shrinkage study involving several excavated test-pits where in-place densities are determined using in-situ testing methods instead of laboratory density testing on small-diameter samples. Please contact SCG for details and a cost estimate regarding a shrinkage study, if desired.

Minor ground subsidence is expected to occur in the soils below the zone of removal, due to settlement and machinery working. The subsidence is estimated to be 0.10 feet.

These estimates are based on previous experience and the subsurface conditions encountered at the boring locations. The actual amount of subsidence is expected to be variable and will be dependent on the type of machinery used, repetitions of use, and dynamic effects, all of which are difficult to assess precisely.

Additional Geotechnical Investigation

As discussed above, the focus of the current phase of investigation was to determine the geotechnical feasibility of the proposed development at the subject site. Prior to preparing detailed grading or foundation plans, a site-specific, detailed geotechnical investigation should be performed. The purpose of this supplementary investigation will be to obtain more detailed data regarding the subsurface conditions at the subject site. The scope of this future investigation should be sufficient to provide detailed grading recommendations as well as foundation, floor slab, and pavement design recommendations.

6.3 Preliminary Site Grading Recommendations

The preliminary grading recommendations presented below are based on the design details that were available at the time of this report, and the subsurface conditions encountered at our boring locations. These recommendations are general and preliminary in nature, and should be confirmed as part of the future design-level geotechnical investigation.

Site Stripping and Demolition

Initial site stripping should include removal of all surficial vegetation from slopes or landscaped planters. Any organic topsoil and tree root masses should be removed during site stripping. The actual extent of site stripping should be determined in the field by the geotechnical engineer, based on the organic content and stability of the materials encountered.

The proposed development will require demolition of portions of the existing buildings and pavements. Any existing improvements that will not remain in place for use with the new development should be removed in their entirety. This should include all foundations, floor slabs, utilities, and any other subsurface improvements associated with the existing structures. Debris resultant from demolition should be disposed of off-site. These materials may be crushed and made into miscellaneous base for use in the proposed pavement areas.

Detailed structural information regarding the new buildings has not been provided to our office. Based on preliminary conversations with the project structural engineer, it is expected that the hotel and residential buildings will be supported on conventional shallow foundations. Small-diameter deep foundations may be utilized to support the structural loads of the new office building that will be constructed over the existing retail.

Treatment of Existing Soils: Hotel and Residential Buildings

Based on the borings performed for this study, as well as borings performed at the subject site as part of previous geotechnical investigations, the area of the proposed hotel and residential buildings is underlain by 5 to 10± feet of undocumented fill soils. These materials are underlain by relatively high strength terrace deposits. The most feasible means of supporting the proposed structures is to utilize shallow foundations which extend through the undocumented fill soils into the dense to very dense terrace deposits below. If this method of construction is utilized, no significant remedial grading will be necessary within the foundation areas of the proposed buildings.

Within a given structure, it is recommended that all foundations be supported within the dense terrace deposits, or on a newly placed layer of compacted structural fill, in order to limit differential settlements. Where foundations are supported on new structural fill soils, this layer of fill is typically 3 to 5± feet in thickness, but the precise depth should be determined during the design-level geotechnical investigation.

Any existing undocumented fill soil should also be removed from proposed building slab areas. It is also recommended that the slab areas be underlain by a newly placed layer of structural fill, at least 2 to 3 feet in thickness. The actual depth of overexcavation should be determined during the design-level geotechnical investigation.

Treatment of Existing Soils: Retaining Walls and Site Walls

Although not indicated on the site plan, it may be necessary to construct some small retaining walls or site walls at or near the existing surface grade. Overexcavation will also be necessary in these areas to remove all of the existing fill soils. The overexcavation depth should be expected to be on the order of 3 to 5 feet below proposed foundation bearing grade. Alternatively, the retaining wall foundations could be extended into the dense to very dense terrace deposits.

Treatment of Existing Soils: Parking Areas

Based on economic considerations, overexcavation of the existing soils in the new parking and drive areas is not considered warranted, with the exception of areas where lower strength, or unstable soils are identified by the geotechnical engineer during grading. Subgrade preparation

in the new parking and drive areas should initially consist of removal of all soils disturbed during stripping and demolition operations.

The geotechnical engineer should then evaluate the subgrade to identify any areas of additional unsuitable soils. Any such materials should be removed to a level of firm and unyielding soil. The exposed subgrade soils should then be scarified to a depth of 12± inches, moisture conditioned to at least 2 to 4 percent above optimum, and recompacted to at least 90 percent of the ASTM D-1557 maximum dry density. Based on the presence of variable strength surficial soils throughout the site, it is expected that some isolated areas of additional overexcavation may be required to remove zones of lower strength, unsuitable soils.

The grading recommendations presented above for the proposed parking areas assume that the owner and/or developer can tolerate minor amounts of settlement within the proposed parking areas. The grading recommendations presented above do not completely mitigate the extent of the existing fill soils and low strength alluvium in the parking areas. As such, settlement and associated pavement distress could occur. Typically, repair of such distressed areas involves significantly lower costs than completely mitigating these soils at the time of construction. If the owner cannot tolerate the risk of such settlements, the parking and drive areas may also be overexcavated, with the removed soils replaced as compacted structural fill.

Fill Placement

- Fill soils should be placed in thin (6± inches), near-horizontal lifts, moisture conditioned to 2 to 4 percent above the optimum moisture content, and compacted. Drying of the on-site soils may be required before placement and compaction of structural fill.
- On-site soils may be used for fill provided they are cleaned of any debris to the satisfaction of the geotechnical engineer.
- All grading and fill placement activities should be completed in accordance with the requirements of the 2019 CBC and the grading code of the city of Brea.
- All fill soils should be compacted to at least 90 percent of the ASTM D-1557 maximum dry density. Fill soils should be well mixed.
- Compaction tests should be performed periodically by the geotechnical engineer as random verification of compaction and moisture content. These tests are intended to aid the contractor. Since the tests are taken at discrete locations and depths, they may not be indicative of the entire fill and therefore should not relieve the contractor of his responsibility to meet the job specifications.

Imported Structural Fill

All imported structural fill should consist of low expansive (EI < 40), well graded soils possessing at least 10 percent fines (that portion of the sample passing the No. 200 sieve). Additional specifications for structural fill are presented in the Grading Guide Specifications, included as Appendix D.

Utility Trench Backfill

In general, all utility trench backfill should be compacted to at least 90 percent of the ASTM D-1557 maximum dry density. Compacted trench backfill should conform to the requirements of the local grading code, and more restrictive requirements may be indicated by the city of Brea. All

utility trench backfills should be witnessed by the geotechnical engineer. The trench backfill soils should be compaction tested where possible; probed and visually evaluated elsewhere.

Utility trenches which parallel a footing, and extending below a 1h:1v plane projected from the outside edge of the footing should be backfilled with structural fill soils, compacted to at least 90 percent of the ASTM D-1557 standard. Pea gravel backfill should not be used for these trenches.

6.4 Construction Considerations

Excavation Considerations

The near-surface soils generally consist of a variety of materials, including sands, silts, and clays. Some of these materials may be subject to caving within shallow excavations. Where caving occurs within shallow excavations, flattened excavation slopes may be sufficient to provide excavation stability. On a preliminary basis, temporary excavation slopes consisting of sands and silty sands should be made no steeper than 2h:1v. Temporary excavation slopes consisting of clayey soils should be made no steeper than 1.5h:1v.

The contractor should take all necessary precautions during grading and foundation construction to prevent damage to structures and improvements which are adjacent to the proposed development. Deeper excavations may require some form of external stabilization such as shoring or bracing. Maintaining adequate moisture content within the near-surface soils will improve excavation stability. All excavation activities on this site should be conducted in accordance with Cal-OSHA regulations.

Moisture Sensitive Subgrade Soils

The near-surface soils generally consist of moist to very moist sands, sandy clays, and silty clays, and will become unstable if exposed to significant moisture infiltration or disturbance by construction traffic. If grading occurs during a period of relatively wet weather, an increase in subgrade instability should also be expected. The site should, therefore, be graded to prevent ponding of surface water and to prevent water from running into excavations.

If the construction schedule dictates that site grading will occur during a period of wet weather, allowances should be made for costs and delays associated with drying the on-site soils or import of a drier, less moisture sensitive fill material. Grading during wet or cool weather may also increase the depth of overexcavation in the pad area as well as the need for and/or the thickness of a crushed stone stabilization layer.

Expansive Soils

The near surface on-site soils have been determined to possess a low to medium expansion potential. Therefore, care should be given to proper moisture conditioning of all building pad subgrade soils to a moisture content of 2 to 4 percent above the Modified Proctor optimum during site grading. All imported fill soils should have very low expansive (EI < 20) characteristics. In addition to adequately moisture conditioning the subgrade soils and fill soils during grading, special care must be taken to maintain moisture content of these soils at 2

to 4 percent above the Modified Proctor optimum. This will require the contractor to frequently moisture condition these soils throughout the grading process, unless grading occurs during a period of relatively wet weather.

Due to the presence of expansive soils at this site, provisions should be made to limit the potential for surface water to penetrate the soils immediately adjacent to the structures. These provisions should include directing surface runoff into rain gutters and area drains, reducing the extent of landscaped areas around the structure, and sloping the ground surface away from the buildings. Where possible, it is recommended that landscaped planters not be located immediately adjacent to the building. If landscaped planters around the building are necessary, it is recommended that drought tolerant plants or a drip irrigation system be utilized, to minimize the potential for deep moisture penetration around the structure. Presented below is a list of additional soil moisture control recommendations that should be considered by the owner, developer, and civil engineer:

- Ponding and areas of low flow gradients in unpaved walkways, grass and planter areas should be avoided. In general, minimum drainage gradients of 2 percent should be maintained in unpaved areas.
- Bare soil within five feet of proposed structures should be sloped at a minimum 2 percent gradient away from the structure (about three inches of fall in five feet), or the same area could be paved with a minimum surface gradient of one percent. Pavement is preferable.
- Decorative gravel ground cover tends to provide a reservoir for surface water and may hide areas of ponding or poor drainage. Decorative gravel is, therefore, not recommended and should not be utilized for landscaping unless equipped with a subsurface drainage system designed by a licensed landscape architect.
- Positive drainage devices, such as graded swales, paved ditches, and catch basins should be installed at appropriate locations within the area of the proposed development.
- Concrete walks and flatwork should not obstruct the free flow of surface water to the appropriate drainage devices.
- Area drains should be recessed below grade to allow free flow of water into the drain. Concrete or brick flatwork joints should be sealed with mortar or flexible mastic.
- Gutter and downspout systems should be installed to capture all discharge from roof areas. Downspouts should discharge directly into a pipe or paved surface system to be conveyed offsite.
- Enclosed planters adjoining, or in close proximity to proposed structures, should be sealed at the bottom and provided with subsurface collection systems and outlet pipes.
- Depressed planters should be raised with soil to promote runoff (minimum drainage gradient two percent or five percent, see above), and/or equipped with area drains to eliminate ponding.
- Drainage outfall locations should be selected to avoid erosion of slopes and/or properly armored to prevent erosion of graded surfaces. No drainage should be directed over or towards adjoining slopes.
- All drainage devices should be maintained on a regular basis, including frequent observations during the rainy season to keep the drains free of leaves, soil and other debris.
- Landscape irrigation should conform to the recommendations of the landscape architect and should be performed judiciously to preclude either soaking or excessive drying of the foundation soils. This should entail regular watering during the drier portions of the year and little or no irrigation during the rainy season. Automatic sprinkler systems should, therefore, be switched to manual operation during the rainy season. Good irrigation practice typically requires frequent application of limited quantities of water that are sufficient to sustain plant growth, but do not excessively wet the soils. Ponding and/or run-off of irrigation water are indications of excessive watering.

Other provisions, as determined by the landscape architect or civil engineer, may also be appropriate.

Groundwater

The static groundwater table at this site is considered to exist at a depth of 22 to 23± feet. Therefore, groundwater is not expected to impact the grading or shallow foundation construction activities. Deep foundations, such as cast-in-drilled-hole (CIDH) piles or piers extending to depths of 20 feet or more will likely encounter groundwater, and groundwater control should be considered in the design and construction planning.

6.5 Preliminary Shallow Foundation Design Recommendations

Based on the preceding geotechnical design considerations and preliminary grading recommendations, it is assumed that the new building foundations will be underlain by existing dense to very dense terrace deposits, or newly placed structural fill soils, extending to depths of at least 3 to 5 feet below foundation bearing grades. Based on this subsurface profile, the proposed structures may be supported on conventional shallow foundations.

The foundation design parameters presented below provide anticipated ranges for the allowable soil bearing pressures. These ranges should be refined during the subsequent design-level geotechnical investigation.

Building Foundation Design Parameters

New square and rectangular footings may be designed as follows:

- Maximum, net allowable soil bearing pressure for footings supported on dense to very dense native terrace deposits: 4,000 to 5,000 lbs/ft^2.
- Maximum, net allowable soil bearing pressure for footings supported on newly-placed engineered fill soils: 2,500 to 3,000 lbs/ft^2.
- Minimum longitudinal steel reinforcement within strip footings: Four (4) No. 5 rebars (2 top and 2 bottom) due to the expansion potential of the on-site soils.
- The actual design of the foundations should be determined by the structural engineer.

General Foundation Design Recommendations

The allowable bearing pressures presented above may be increased by one-third when considering short duration wind or seismic loads. Additional reinforcement may be necessary for structural considerations. The actual design of the foundations should be determined by the structural engineer.

Estimated Foundation Settlements

Typically, foundations designed in accordance with the preliminary foundation design parameters presented above will experience total and differential settlements of less than 1.5 and 0.75 inches, respectively. A detailed settlement analysis should be conducted as part of the design-level geotechnical investigation, once detailed foundation loading information is available.

Lateral Load Resistance

Lateral load resistance will be developed by a combination of friction acting at the base of foundations and slabs and the passive earth pressure developed by footings below grade. The following friction and passive pressure may be used to resist lateral forces:

- Passive Earth Pressure: 225 to 275 lbs/ft^3
- Friction Coefficient: 0.25 to 0.30

6.6 Preliminary Deep Foundation Design Recommendations

Deep foundations may be the desirable method of support for the proposed office building, in order to minimize the impact to the tenants of the existing retail that will remain in place below the new office building. Typically, these deep foundations would consist of cast-in-drilled-hole (CIDH) piles. Based on the subsurface conditions encountered at this site, these piles would need to extend to depths of at least 15 to 20± feet. On a preliminary basis, CIDH piles extending to a depth of 20± feet would have the following approximate vertical capacities:

- 18-inch CIDH piles: 40 to 80 kips
- 24-inch CIDH piles: 55 to 110 kips
- 18-inch CIDH piles: 80 to 160 kips

Other types of specialty piles may also be feasible for this site, including pneumatically driven micro-piles or helical piles. These systems are typically designed and installed by a specialty contractor. We can provide geotechnical design parameters to such a contractor at the client's request.

6.7 Preliminary Floor Slab Design and Construction Recommendations

Subgrades which will support new floor slabs should be prepared in accordance with the recommendations contained in the *Site Grading Recommendations* section of this report. Preliminarily, the floors of the proposed structures may be constructed as conventional slabs-on-grade supported on newly placed structural fill. Based on geotechnical considerations, the floor slabs may be designed as follows:

- Minimum slab thickness: 5 to 6 inches.

- Steel reinforcement is expected to be necessary, based on the expansive potential of the soils underlying the subject site. Typically, No. 3 or No. 4 bars at 16 to 18 inches on center is adequate.

- Slab underlayment: If moisture sensitive floor coverings will be used then minimum slab underlayment should consist of a moisture vapor barrier constructed below the entire area of the proposed slab which will incorporate such coverings. The moisture vapor barrier should meet or exceed the Class A rating as defined by ASTM E 1745-97 and have a permeance rating less than 0.01 perms as described in ASTM E 96-95 and ASTM E 154-88. A polyolefin material such as Stego® Wrap Vapor Barrier or equivalent will meet these

specifications. The moisture vapor barrier should be properly constructed in accordance with all applicable manufacturer specifications. Given that a rock free subgrade is anticipated and that a capillary break is not required, sand below the barrier is not required. The need for sand and/or the amount of sand above the moisture vapor barrier should be specified by the structural engineer or concrete contractor. The selection of sand above the barrier is not a geotechnical engineering issue and hence outside our purview. Where moisture sensitive floor coverings are not anticipated, the vapor barrier may be eliminated.

- Moisture condition the floor slab subgrade soils to 2 to 4 percent above the Modified Proctor optimum moisture content, to a depth of 12 inches. The moisture content of the floor slab subgrade soils should be verified by the geotechnical engineer within 24 hours prior to concrete placement.

- Proper concrete curing techniques should be utilized to reduce the potential for slab curling or the formation of excessive shrinkage cracks.

The actual design of the floor slab should be completed by the structural engineer to verify adequate thickness and reinforcement. The recommendations presented above should be confirmed during the design level geotechnical investigation.

6.8 Preliminary Retaining Wall Design and Construction

Although not indicated on the site plan, some small (less than 6 feet in height) retaining walls may be required to facilitate the new site grades. The parameters recommended for use in the design of these walls are presented below.

Retaining Wall Design Parameters

Based on the soil conditions encountered at the boring locations, the following parameters may be used for preliminary design of new retaining walls for this site. Most of the on-site soils consist of potentially expansive silty and sandy clays. These materials are not considered suitable for use as retaining wall backfill. Therefore, we have provided parameters assuming the use of imported very low expansive soils for retaining wall backfill. These imported soils should consist of well graded sands or silty sands, possessing an internal angle of friction of at least 30 degrees when compacted to 90 percent relative compaction.

If desired, SCG could provide design parameters for an alternative select backfill material behind the retaining walls. The use of select backfill material could result in lower lateral earth pressures. In order to use the design parameters for the imported select fill, this material must be placed within the entire active failure wedge. This wedge is defined as extending from the heel of the retaining wall upwards at an angle of approximately 60° from horizontal. If select backfill material behind the retaining wall is desired, SCG should be contacted for supplementary recommendations.

RETAINING WALL DESIGN PARAMETERS

Design Parameter		Soil Type Imported Sands and Silty Sands
Internal Friction Angle (ϕ)		30°
Unit Weight		130 lbs/ft^3
Equivalent Fluid Pressure:	Active Condition (level backfill)	43 lbs/ft^3
	Active Condition (2h:1v backfill)	70 lbs/ft^3
	At-Rest Condition (level backfill)	65 lbs/ft^3

The walls should be designed using a soil-footing coefficient of friction of 0.25 and an equivalent passive pressure of 250 lbs/ft^3. The structural engineer should incorporate appropriate factors of safety in the design of the retaining walls.

The active earth pressure may be used for the design of retaining walls that do not directly support structures or support soils that in turn support structures and which will be allowed to deflect. The at-rest earth pressure should be used for walls that will not be allowed to deflect such as those which will support foundation bearing soils, or which will support foundation loads directly.

Where the soils on the toe side of the retaining wall are not covered by a "hard" surface such as a structure or pavement, the upper 1 foot of soil should be neglected when calculating passive resistance due to the potential for the material to become disturbed or degraded during the life of the structure.

Seismic Lateral Earth Pressures

In addition to the lateral earth pressures presented in the previous section, retaining walls which are more than 6 feet in height should be designed for a seismic lateral earth pressure, in accordance with the 2019 CBC. Based on the current site plan, it is not expected that any walls in excess of 6 feet in height will be required for this project. If any such walls are proposed, our office should be contacted for supplementary design recommendations.

Retaining Wall Foundation Design

Foundations to support new retaining walls should be designed in accordance with the general Foundation Design Parameters presented in a previous section of this report.

Backfill Material

The on-site soils are not considered suitable for use as retaining wall backfill. All retaining wall backfill soils should consist of imported very low expansive sands or silty sands. All backfill material placed within 3 feet of the back wall face should have a particle size no greater than 3 inches. The retaining wall backfill materials should be well graded.

It is recommended that a minimum 1 foot thick layer of free-draining granular material (less than 5 percent passing the No. 200 sieve) be placed against the face of the retaining walls. This material should extend from the top of the retaining wall footing to within 1 foot of the ground surface on the back side of the retaining wall. This material should be approved by the geotechnical engineer. In lieu of the 1 foot thick layer of free-draining material, a properly installed prefabricated drainage composite such as the MiraDRAIN 6000XL (or approved equivalent), which is specifically designed for use behind retaining walls, may be used. If the layer of free-draining material is not covered by an impermeable surface, such as a structure or pavement, a 12-inch thick layer of a low permeability soil should be placed over the backfill to reduce surface water migration to the underlying soils. The layer of free draining granular material should be separated from the backfill soils by a suitable geotextile, approved by the geotechnical engineer.

All retaining wall backfill should be placed and compacted under engineering controlled conditions in the necessary layer thicknesses to ensure an in-place density between 90 and 93 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D1557). Care should be taken to avoid over-compaction of the soils behind the retaining walls, and the use of heavy compaction equipment should be avoided.

Subsurface Drainage

As previously indicated, the retaining wall design parameters are based upon drained backfill conditions. Consequently, some form of permanent drainage system will be necessary in conjunction with the appropriate backfill material. Subsurface drainage may consist of either:

- A weep hole drainage system typically consisting of a series of 4-inch diameter holes in the wall situated slightly above the ground surface elevation on the exposed side of the wall and at an approximate 8-foot on-center spacing. The weep holes should include a 2 cubic foot pocket of open graded gravel, surrounded by an approved geotextile fabric, at each weep hole location.

- A 4-inch diameter perforated pipe surrounded by 2 cubic feet of gravel per linear foot of drain placed behind the wall, above the retaining wall footing. The gravel layer should be wrapped in a suitable geotextile fabric to reduce the potential for migration of fines. The footing drain should be extended to daylight or tied into a storm drainage system.

6.9 Preliminary Pavement Design Parameters Recommendations

Presented below are preliminary recommendations for the proposed pavements at the subject site. Grading recommendations for these pavement areas should be developed during the design-level geotechnical investigation.

Pavement Subgrades

It is anticipated that the new pavements will be supported on the existing fill soils that have been scarified, moisture conditioned, and recompacted. These materials generally consist of sandy clays and silty clays, as well as occasional zones of sands and silty sands. These materials are

expected to exhibit poor to fair pavement support characteristics, with estimated R-values of 10 to 25. R-value testing performed by SCG as part of a previous study at Brea Plaza indicated an R-value of 13. The subsequent pavement designs are based upon a conservatively assumed R-value of 10. Any fill material imported to the site should have support characteristics equal to or greater than that of the on-site soils and be placed and compacted under engineering controlled conditions. It may be desirable to perform R-value testing after the completion of rough grading to verify the R-value of the as-graded pavement subgrade.

It is recommended that R-value testing be performed during the design-level geotechnical investigation or after completion of rough grading. Depending upon the results of the R-value testing, it may be feasible to use thinner pavement sections in some areas of the site.

Asphaltic Concrete

Presented below are the recommended thicknesses for new flexible pavement structures consisting of asphaltic concrete over a granular base. The pavement designs are based on the traffic indices (TI's) indicated. The client and/or civil engineer should verify that these TI's are representative of the anticipated traffic volumes. If the client and/or civil engineer determine that the expected traffic volume will exceed the applicable traffic index, we should be contacted for supplementary recommendations. The design traffic indices equate to the following approximate daily traffic volumes over a 20-year design life, assuming six operational traffic days per week.

Traffic Index	No. of Heavy Trucks per Day
4.0	0
5.0	1
6.0	3
7.0	11

For the purpose of the traffic volumes indicated above, a truck is defined as a 5-axle tractor trailer unit with one 8-kip axle and two 32-kip tandem axles. All of the traffic indices allow for 1,000 automobiles per day.

ASPHALT PAVEMENTS (R = 10)				
Materials	Thickness (inches)			
	Auto Parking (TI = 4.0)	Auto Drive Lanes (TI = 5.0)	Truck Traffic	
			(TI = 6.0)	(TI = 7.0)
Asphalt Concrete	3	3	3½	4
Aggregate Base	6	9	11	15
Compacted Subgrade	12	12	12	12

The aggregate base course should be compacted to at least 95 percent of the ASTM D-1557 maximum dry density. The asphaltic concrete should be compacted to at least 95 percent of the batch plant-reported maximum density. The aggregate base course may consist of crushed aggregate base (CAB) or crushed miscellaneous base (CMB), which is a recycled gravel, asphalt

and concrete material. The gradation, R-Value, Sand Equivalent, and Percentage Wear of the CAB or CMB should comply with appropriate specifications contained in the current edition of the "Greenbook" Standard Specifications for Public Works Construction.

Portland Cement Concrete

The preparation of the subgrade soils within concrete pavement areas should be performed as previously described for proposed asphalt pavement areas. The minimum recommended thicknesses for the Portland Cement Concrete pavement sections are as follows:

PORTLAND CEMENT CONCRETE PAVEMENTS (R = 10)			
Materials	Thickness (inches)		
	Auto Parking & Drives (TI = 5.0)	Truck Traffic	
		(TI = 6.0)	(TI = 7.0)
PCC	5	5½	6
Compacted Subgrade (95% Relative Compaction)	12	12	12

The concrete should have a 28-day compressive strength of at least 3,000 psi. Reinforcing within all pavements should be designed by the structural engineer. The maximum joint spacing within all of the PCC pavements is recommended to be equal to or less than 30 times the pavement thickness. The actual joint spacing and reinforcing of the Portland cement concrete pavements should be determined by the structural engineer.

7.0 GENERAL COMMENTS

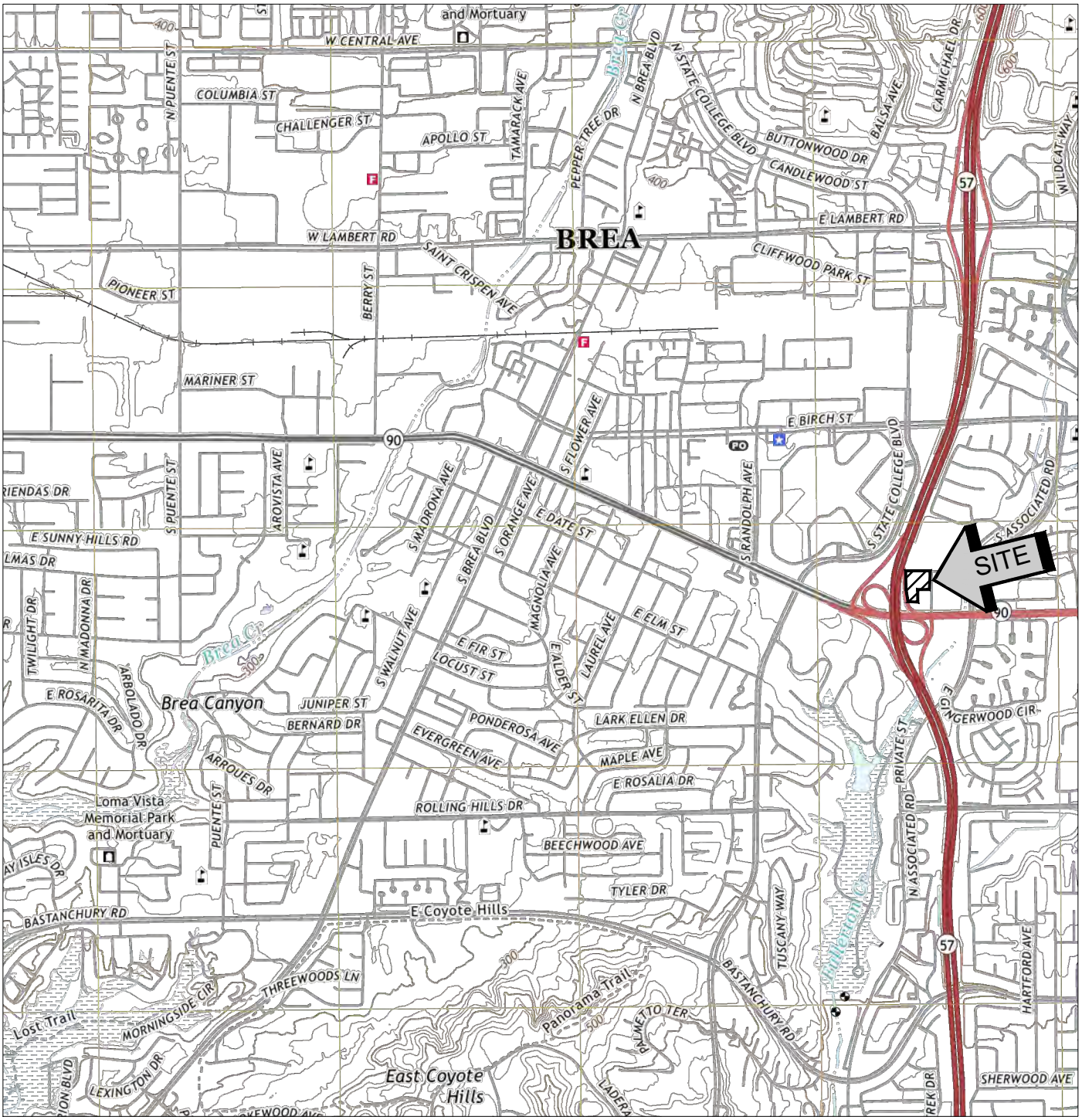
This report has been prepared as an instrument of service for use by the client, in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, civil engineer, and/or structural engineer. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur. The client(s)' reliance upon this report is subject to the Engineering Services Agreement, incorporated into our proposal for this project.

The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between boring locations and sample depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.

This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted.

The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

APPENDIX A



SOURCE: USGS TOPOGRAPHIC MAP OF THE LA HABRA QUADRANGLE, ORANGE COUNTY, CALIFORNIA, 2018

SITE LOCATION MAP

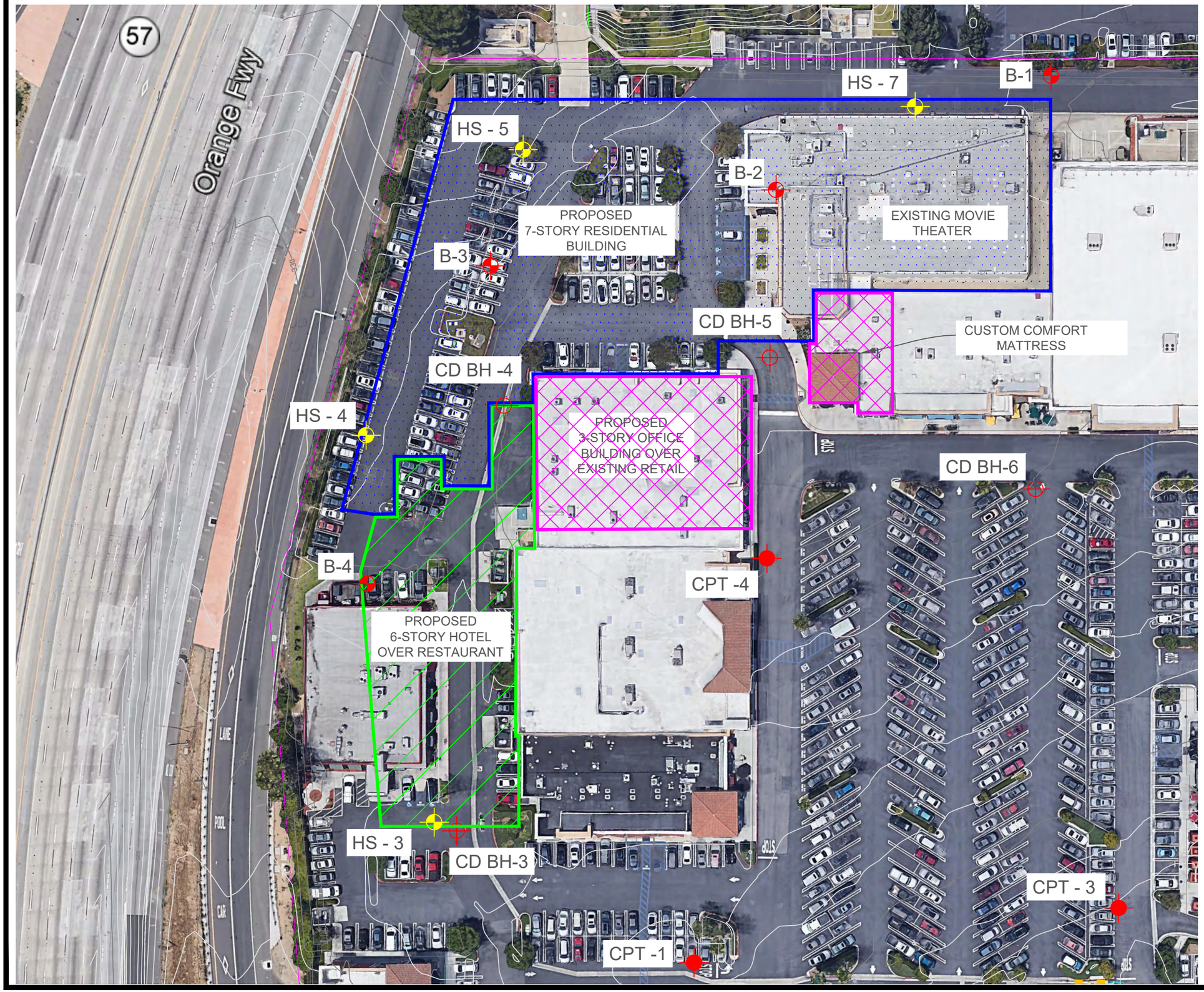
PROPOSED BREA PLAZA MIXED USE

BREA, CALIFORNIA

SCALE: 1" = 2000'	
DRAWN: JAH CHKD: DN	
SCG PROJECT 20G168-1	
PLATE 1	

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



GEOTECHNICAL LEGEND

- **APPROXIMATE BORING LOCATION**
- **APPROXIMATE 6-INCH DIAMETER BORING LOCATION (PACIFIC SOILS ENGINEERING)**
- **APPROXIMATE CPT LOCATION (PACIFIC SOILS ENGINEERING)**
- **APPROXIMATE 16 TO 24-INCH DIAMETER BORING LOCATION (CONVERSE, DAVIS, DIXON ASSOCIATES, 1975)**
- **PROPOSED 3-STORY OFFICE BUILDING OVER EXISTING RETAIL**
- **PROPOSED 6-STORY HOTEL OVER RESTAURANT**
- **PROPOSED 7-STORY RESIDENTIAL BUILDING**

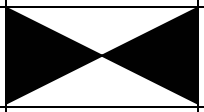
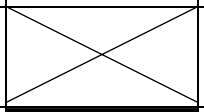
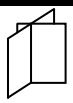
NOTE: CONCEPTUAL SITE PLAN PROVIDED BY ARCHITECTS ORANGE.

BORING LOCATION PLAN
PROPOSED BREA PLAZA MIXED USE
BREA, CALIFORNIA
SCALE: 1" = 60'
DRAWN: JAH CHKD: GKM
SCG PROJECT 20G168-1
PLATE 2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL

APPENDIX B

BORING LOG LEGEND

SAMPLE TYPE	GRAPHICAL SYMBOL	SAMPLE DESCRIPTION
AUGER		SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED)
CORE		ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK.
GRAB		SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED)
CS		CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED)
NSR		NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL.
SPT		STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED)
SH		SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED)
VANE		VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED.

COLUMN DESCRIPTIONS

DEPTH: Distance in feet below the ground surface.

SAMPLE: Sample Type as depicted above.

BLOW COUNT: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

POCKET PEN.: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

GRAPHIC LOG: Graphic Soil Symbol as depicted on the following page.

DRY DENSITY: Dry density of an undisturbed or relatively undisturbed sample in lbs/ft^3.

MOISTURE CONTENT: Moisture content of a soil sample, expressed as a percentage of the dry weight.

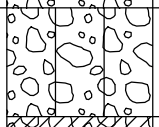
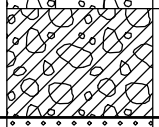
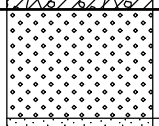
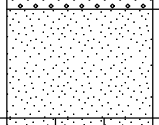
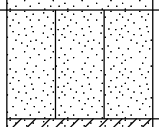
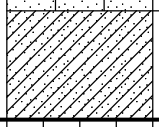
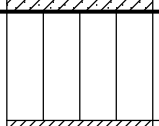
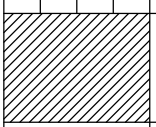
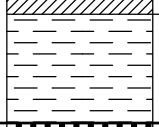
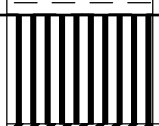
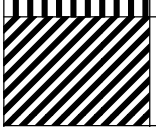
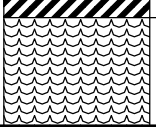
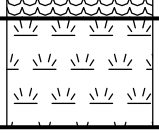
LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

PLASTIC LIMIT: The moisture content above which a soil behaves as a plastic.

PASSING #200 SIEVE: The percentage of the sample finer than the #200 standard sieve.

UNCONFINED SHEAR: The shear strength of a cohesive soil sample, as measured in the unconfined state.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-1

JOB NO.: 20G168-1
PROJECT: Proposed Brea Plaza Mixed Use
LOCATION: Brea, California

DRILLING DATE: 7/9/20
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

WATER DEPTH: 23.5 feet
CAVE DEPTH: 19 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 330.5 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					4± inches Asphaltic Concrete, 7± inches Aggregate Base							
		18	3.5		POSSIBLE FILL: Brown fine Sandy Clay, trace to little Calcareous nodules, stiff to very stiff-moist to very moist		16					EI = 55 @ 0 to 5 feet
		18	1.5				16					
5												
		36			TERRACE DEPOSITS: Brown Clayey fine Sand, dense-damp		9					
		50			Light Brown fine Sand, trace Silt, very dense-damp to moist		9					
10												
					Red Brown Clayey fine Sand, little Calcareous veining/nodules, very dense-very moist							
		56					18					
15												
					Gray Brown to Brown fine to coarse Sand, trace to little Silt, trace fine to coarse Gravel, little Calcareous veining/nodules, very dense-moist to very moist							
		81/11"					12					
20												
		48			@ 23½ feet, 3-inch Clayey fine Sand lense, wet		15					
25					Boring Terminated at 25 feet							

TBL 20G168-1.GPJ SOCALGEO.GDT 7/30/20

TEST BORING LOG **PLATE B-1**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-2

JOB NO.: 20G168-1
PROJECT: Proposed Brea Plaza Mixed Use
LOCATION: Brea, California

DRILLING DATE: 7/9/20
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

WATER DEPTH: 22.5 feet
CAVE DEPTH: 30 feet
READING TAKEN: 3 hours after Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 331.4 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					8± inches Asphaltic Concrete, 5½± inches Aggregate Base							
		56			FILL: Brown Silty fine Sand, trace Clay nodules, mottled, dense to very dense-damp	113	9					
		84				94	8					
5		71			FILL: Brown Silty Clay, little fine Sand, trace root fragments, mottled, hard-damp	96	9					Disturbed Sample
		79			TERRACE DEPOSITS: Light Brown fine Sand, trace Silt, very dense-damp	95	5					
		63			Light Gray Brown Silty fine Sand, medium dense to dense-damp to very moist	100	6					
10												
		28					16					
15												
		51				101	16					
20												
		28	2.5		Light Brown Silty Clay, trace to little fine Sand, very stiff-very moist		24					
25												
					Brown Silty fine Sand, dense-very moist to wet							
		45				98	24					
30												
		24	4.0		Red Brown to Brown fine Sandy Clay, very stiff to hard-very moist		17					

TBL 20G168-1.GPJ SOCALGEO.GDT 7/30/20

TEST BORING LOG

PLATE B-2a

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-2

JOB NO.: 20G168-1
PROJECT: Proposed Brea Plaza Mixed Use
LOCATION: Brea, California

DRILLING DATE: 7/9/20
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

WATER DEPTH: 22.5 feet
CAVE DEPTH: 30 feet
READING TAKEN: 3 hours after Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					Red Brown to Brown fine Sandy Clay, very stiff-moist							
					Brown Silty Clay, trace fine Sand, trace Iron oxide staining, trace Calcareous nodules, stiff-very moist to wet							
40		20	3.5			89	36					
					Light Brown Clayey Silt, little fine Sand, very stiff-very moist to wet							
45		35	1.5				26					
50		22				92	28					
					Boring Terminated at 50 feet							

TBL 20G168-1.GPJ SOCALGEO.GDT 7/30/20

TEST BORING LOG

PLATE B-2b

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-3

JOB NO.: 20G168-1
PROJECT: Proposed Brea Plaza Mixed Use
LOCATION: Brea, California

DRILLING DATE: 7/9/20
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

WATER DEPTH: 23.5 feet
CAVE DEPTH: 14 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 331.1 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					3½± inches Asphaltic Concrete; 7± inches Aggregate Base							
		14	2.5		FILL: Gray Brown fine Sandy Clay, trace wood fragments, trace brick fragments, trace Asphaltic concrete fragments, mottled, stiff-moist		14					EI = 38 @ 0 to 5 feet
		8	2.5				13					
5												
		36			TERRACE DEPOSITS: Brown Silty fine Sand, medium dense to dense-moist		15					
		20					11					
10												
					Light Brown fine Sand, trace Silt, dense-moist							
		47					8					
15												
					Light Brown Silty fine Sand, medium dense-moist							
		20					12					
					Light Brown fine Sandy Silt, little Clay, trace Calcareous veining, medium dense-very moist		26					
20												
					Light Brown Silty Clay, little fine Sand, very stiff-very moist to wet							
		19					27					
25												
					Boring Terminated at 25 feet							

TBL 20G168-1.GPJ SOCALGEO.GDT 7/30/20

TEST BORING LOG

PLATE B-3

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-4

JOB NO.: 20G168-1
PROJECT: Proposed Brea Plaza Mixed Use
LOCATION: Brea, California

DRILLING DATE: 7/9/20
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

WATER DEPTH: 23.5 feet
CAVE DEPTH: 26 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 329.3 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					3± inches Asphaltic Concrete; 5± inches Aggregate Base							
		29			FILL: Brown to Light Brown Clayey fine Sand, mottled, medium dense-moist	106	15					
		34				104	16					
5		17				95	13					
		27	4.5		POSSIBLE FILL: Brown to Light Brown Clayey fine Sand to fine Sandy Clay, mottled, medium dense/very stiff-moist	108	18					
		41			TERRACE DEPOSITS: Light Brown fine Sand, trace Silt, medium dense-damp to moist	97	5					
10												
		36				94	7					
15												
					Light Brown Silty fine Sand, dense-moist							
		40					10					
20												
					Brown Silty Clay, little fine Sand, hard-very moist							
		58	4.5			109	20					
25												
					Light Brown Clayey Silt, little fine Sand, hard-wet							
		38					23					
30												
		23				104	20					
					Gray Brown fine Sand, trace Silt, medium dense-wet							

TBL 20G168-1.GPJ SOCALGEO.GDT 7/30/20

TEST BORING LOG

PLATE B-4a

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-4

JOB NO.: 20G168-1
PROJECT: Proposed Brea Plaza Mixed Use
LOCATION: Brea, California

DRILLING DATE: 7/9/20
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

WATER DEPTH: 23.5 feet
CAVE DEPTH: 26 feet
READING TAKEN: At Completion

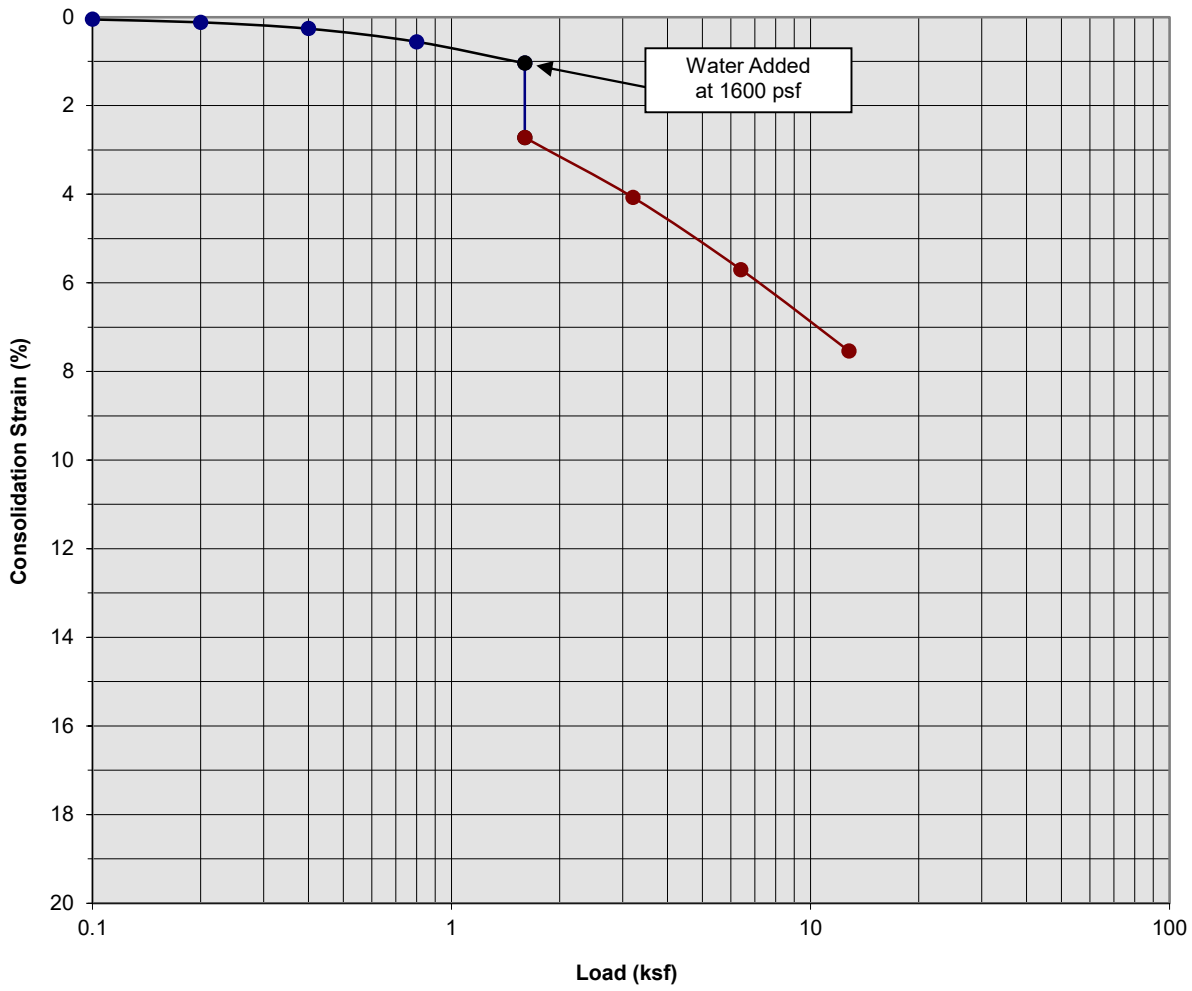
FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					Gray Brown fine Sand, trace Silt, medium dense-wet							
					Gray Brown Silty Clay, little fine Sand, hard-very moist to wet							
40		36	4.5				20					
45		43	3.5			106	19					
					Light Brown fine Sandy Clay, very stiff-very moist to wet							
50		24	3.0				27					
					Boring Terminated at 50 feet							

TBL 20G168-1.GPJ SOCALGEO.GDT 7/30/20

TEST BORING LOG **PLATE B-4b**

APPENDIX C

Consolidation/Collapse Test Results



Classification: FILL: Brown Silty Clay, little fine Sand

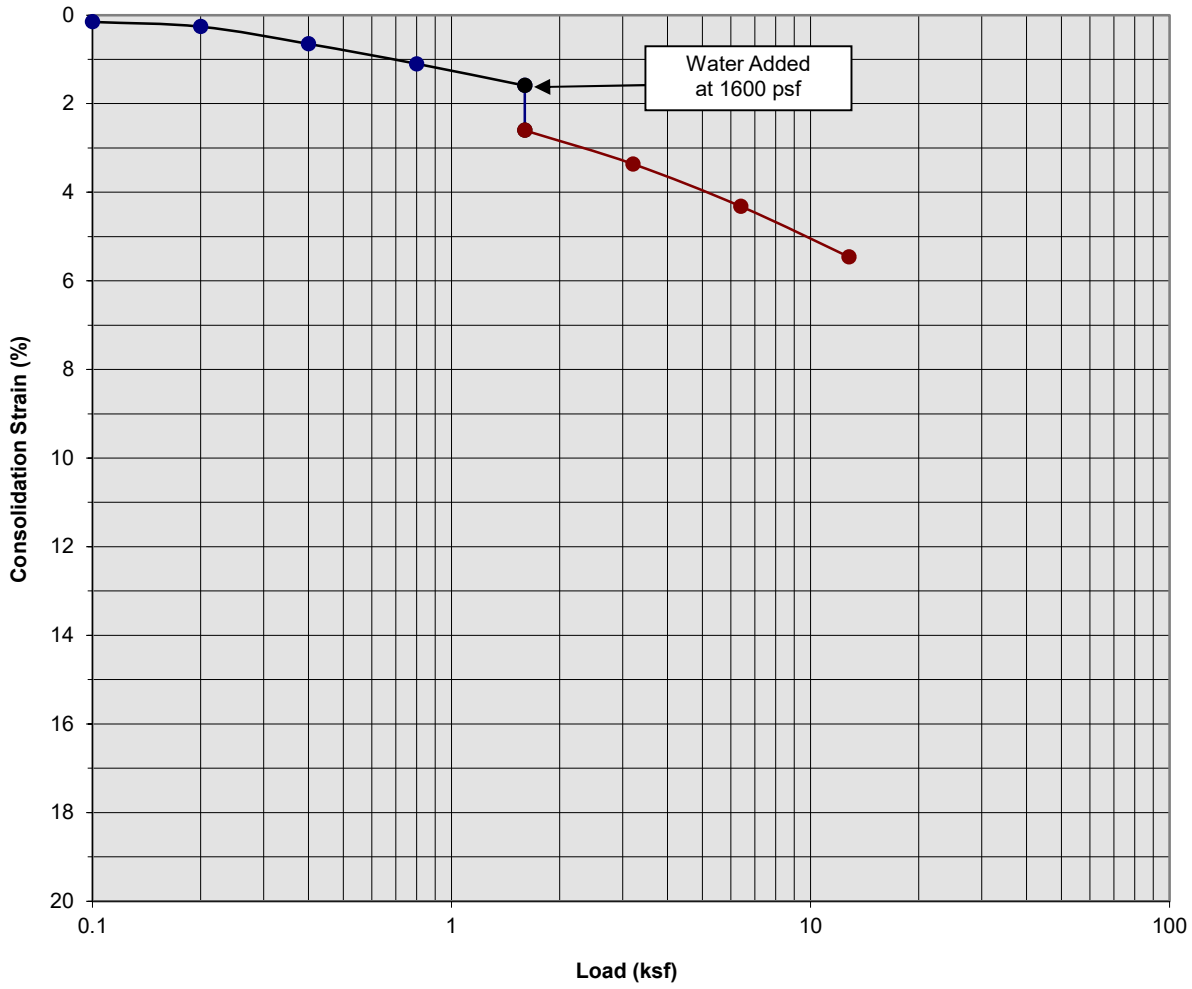
Boring Number:	B-2	Initial Moisture Content (%)	9
Sample Number:	---	Final Moisture Content (%)	24
Depth (ft)	5 to 6	Initial Dry Density (pcf)	95.7
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	103.2
Specimen Thickness (in)	1.0	Percent Collapse (%)	1.68

Proposed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-1

PLATE C- 1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: TERRACE: Light Gray Brown Silty fine Sand

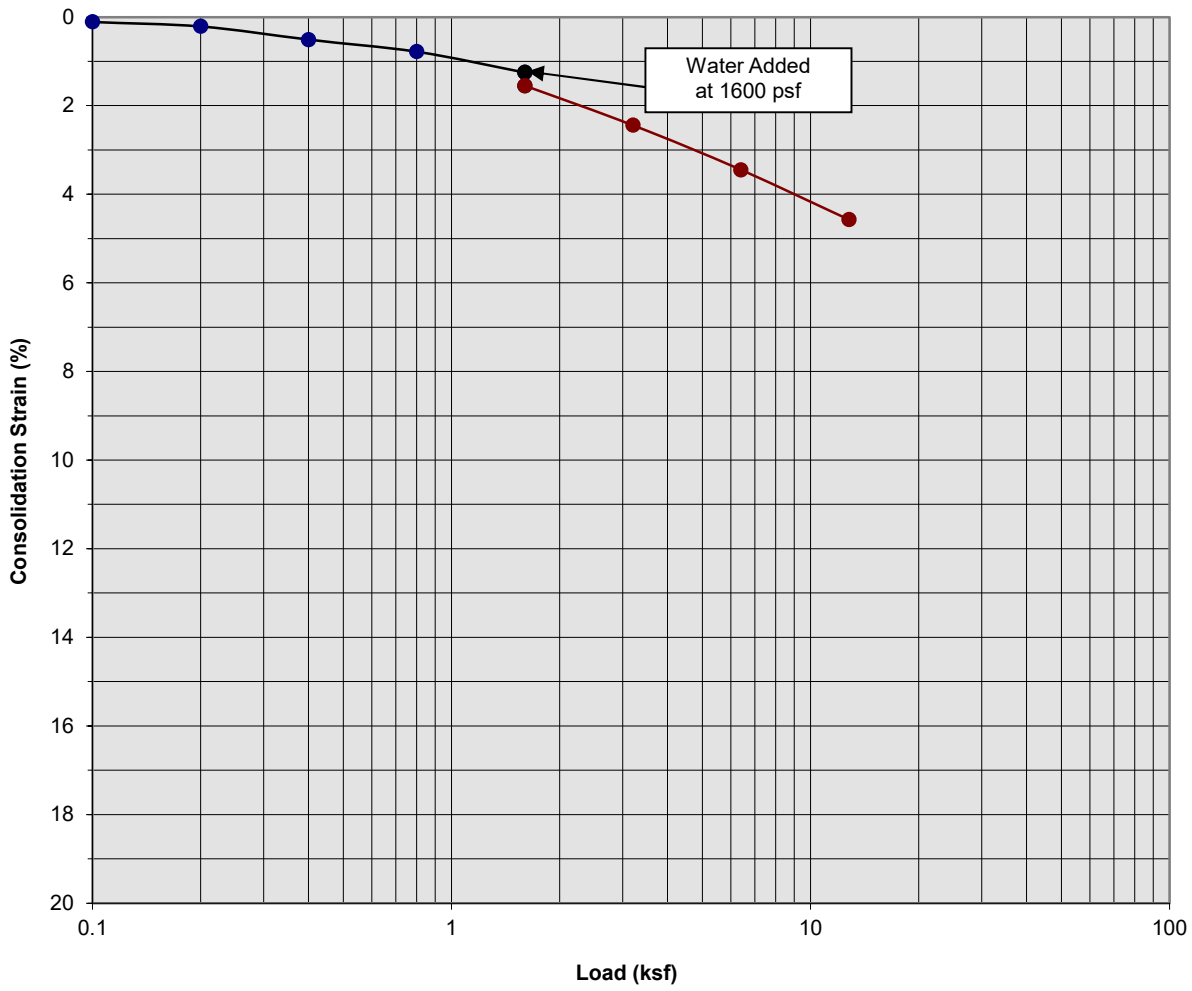
Boring Number:	B-2	Initial Moisture Content (%)	5
Sample Number:	---	Final Moisture Content (%)	21
Depth (ft)	9 to 10	Initial Dry Density (pcf)	100.9
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	106.4
Specimen Thickness (in)	1.0	Percent Collapse (%)	1.01

Proposed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-1

PLATE C- 2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: TERRACE: Light Gray Brown Silty fine Sand

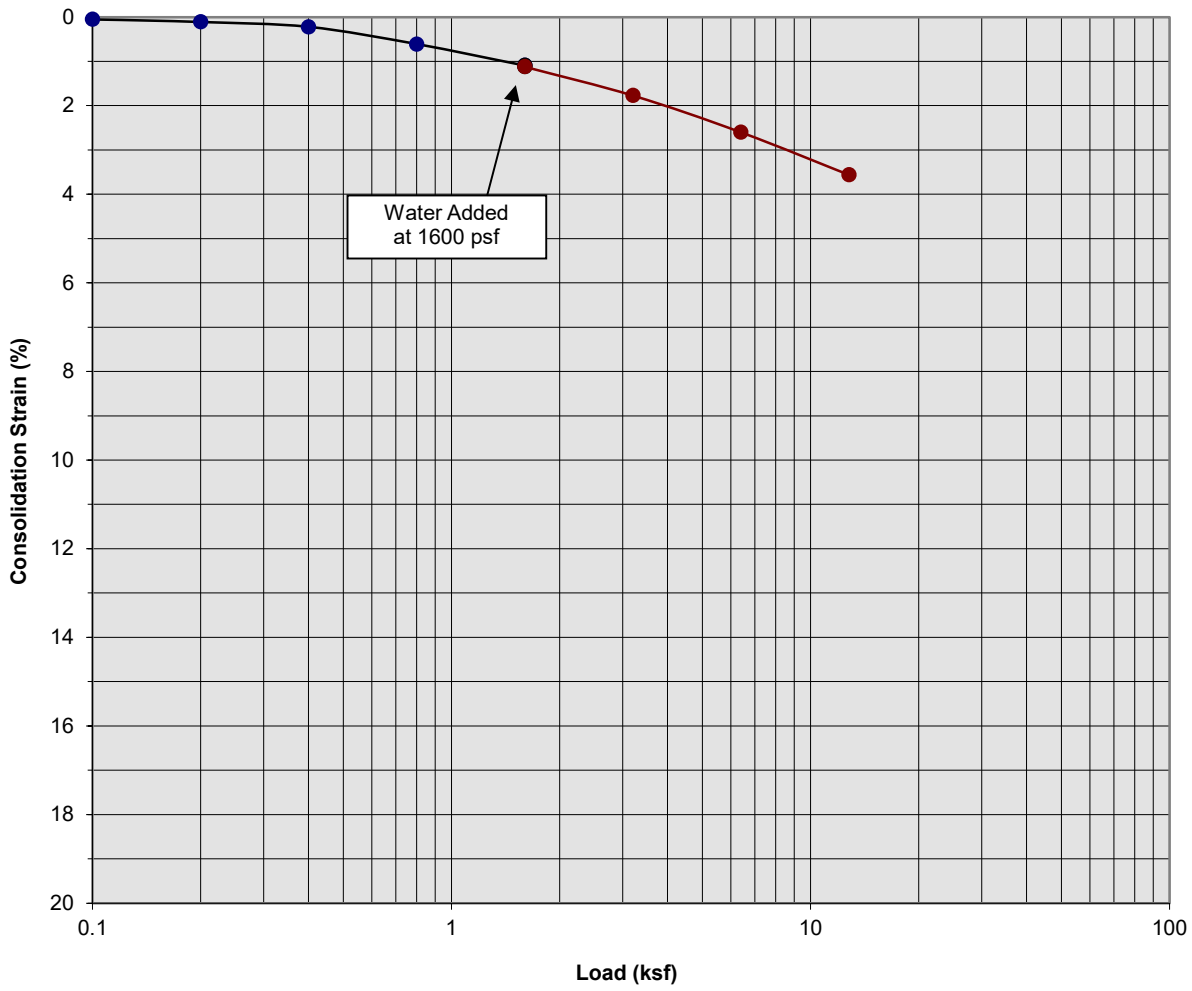
Boring Number:	B-2	Initial Moisture Content (%)	16
Sample Number:	---	Final Moisture Content (%)	19
Depth (ft)	19 to 20	Initial Dry Density (pcf)	100.8
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	105.5
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.30

Proposed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-1

PLATE C- 3

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: TERRACE: Brown Silty fine Sand

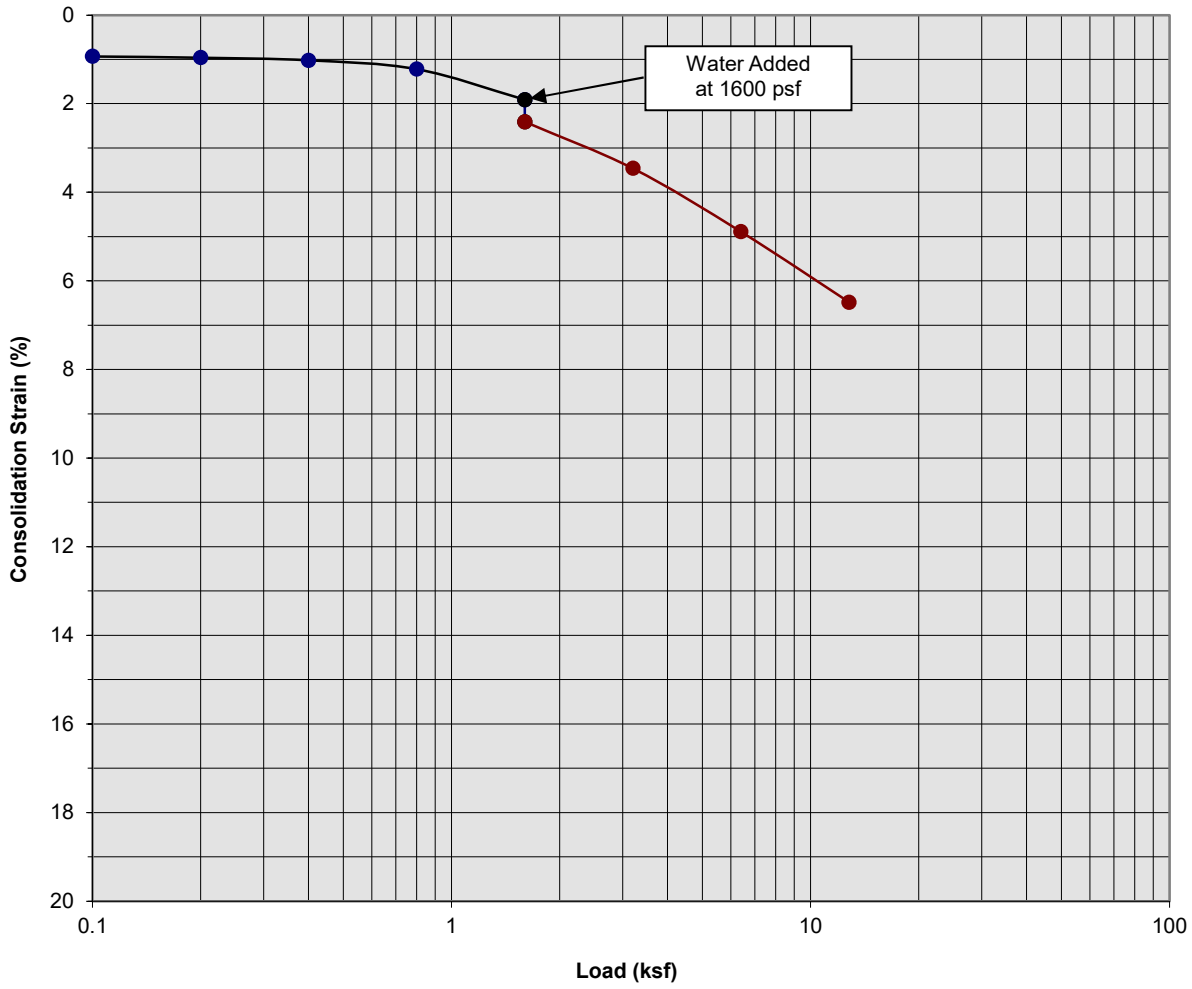
Boring Number:	B-2	Initial Moisture Content (%)	24
Sample Number:	---	Final Moisture Content (%)	23
Depth (ft)	29 to 30	Initial Dry Density (pcf)	98.3
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	101.9
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.03

Proposed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-1

PLATE C- 4

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: FILL: Brown to Light Brown Clayey fine Sand

Boring Number:	B-4	Initial Moisture Content (%)	16
Sample Number:	---	Final Moisture Content (%)	17
Depth (ft)	3 to 4	Initial Dry Density (pcf)	104.0
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	112.3
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.50

Proposed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-1

PLATE C- 5

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
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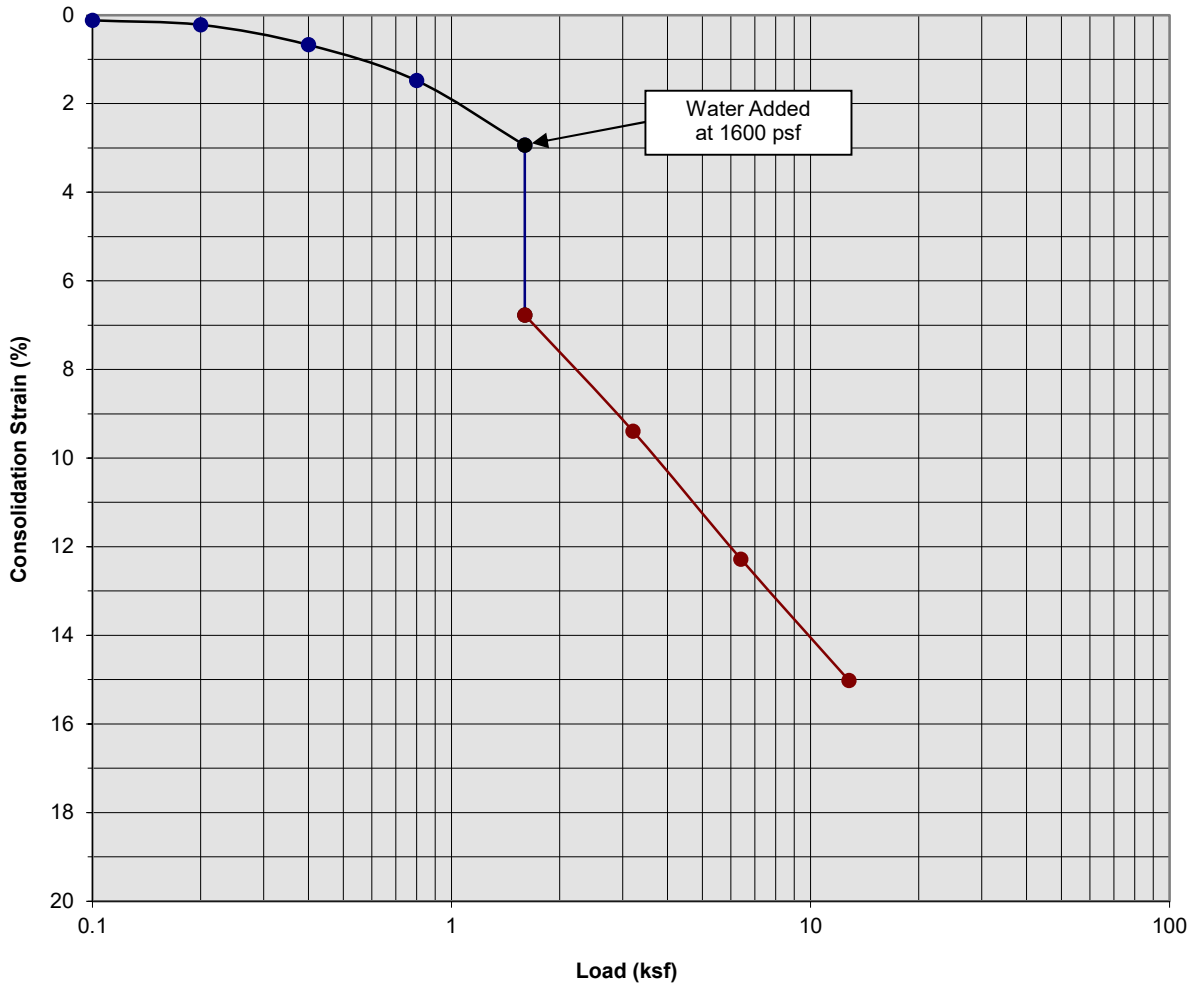
Consolidation/Collapse Test Results



Classification: FILL: Brown to Light Brown Clayey fine Sand

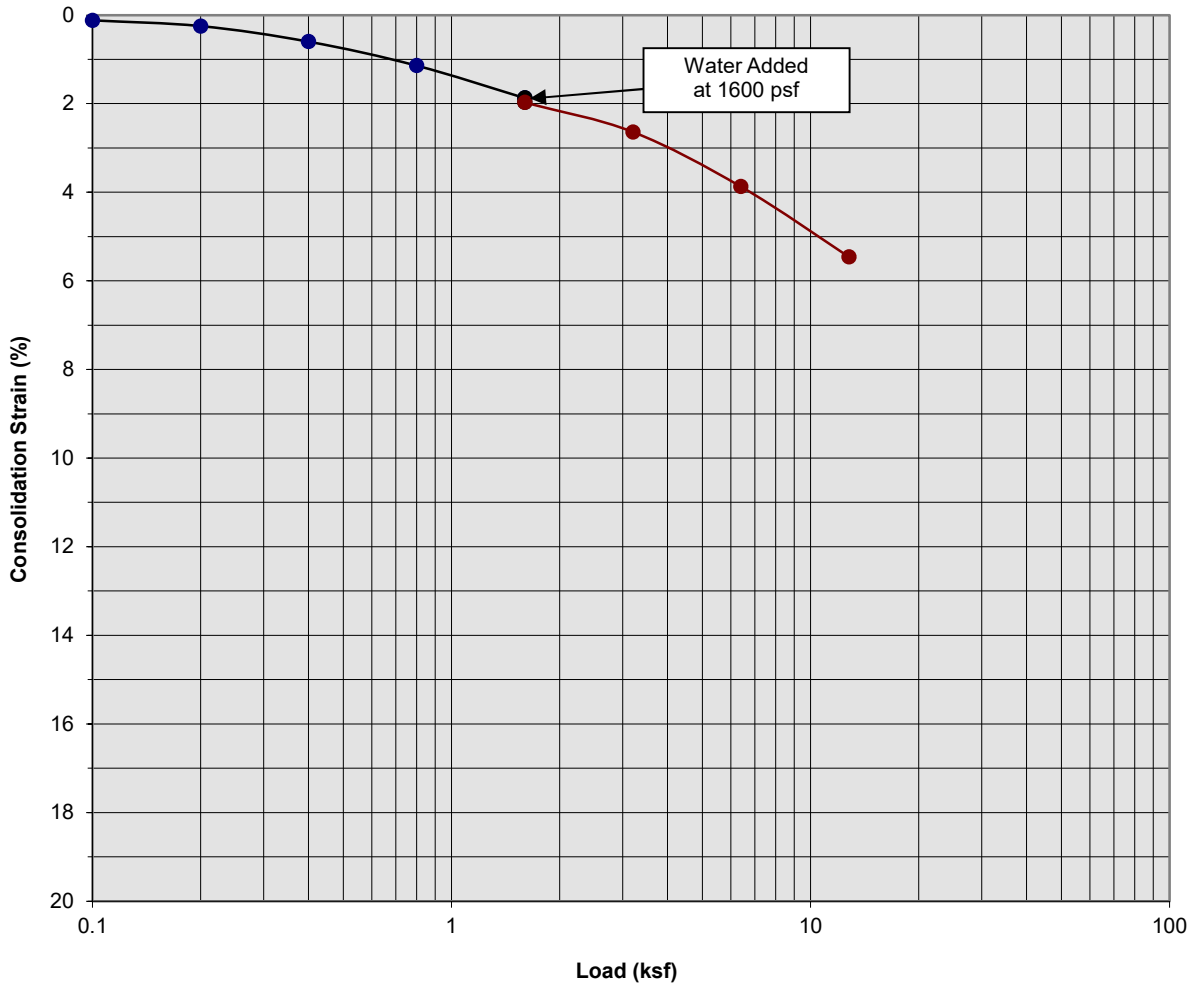
Boring Number:	B-4	Initial Moisture Content (%)	14
Sample Number:	---	Final Moisture Content (%)	20
Depth (ft)	5 to 6	Initial Dry Density (pcf)	94.7
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	112.0
Specimen Thickness (in)	1.0	Percent Collapse (%)	3.83

Proposed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-1

PLATE C- 6

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: FILL: Light Brown Clayey fine Sand to fine Sandy Clay

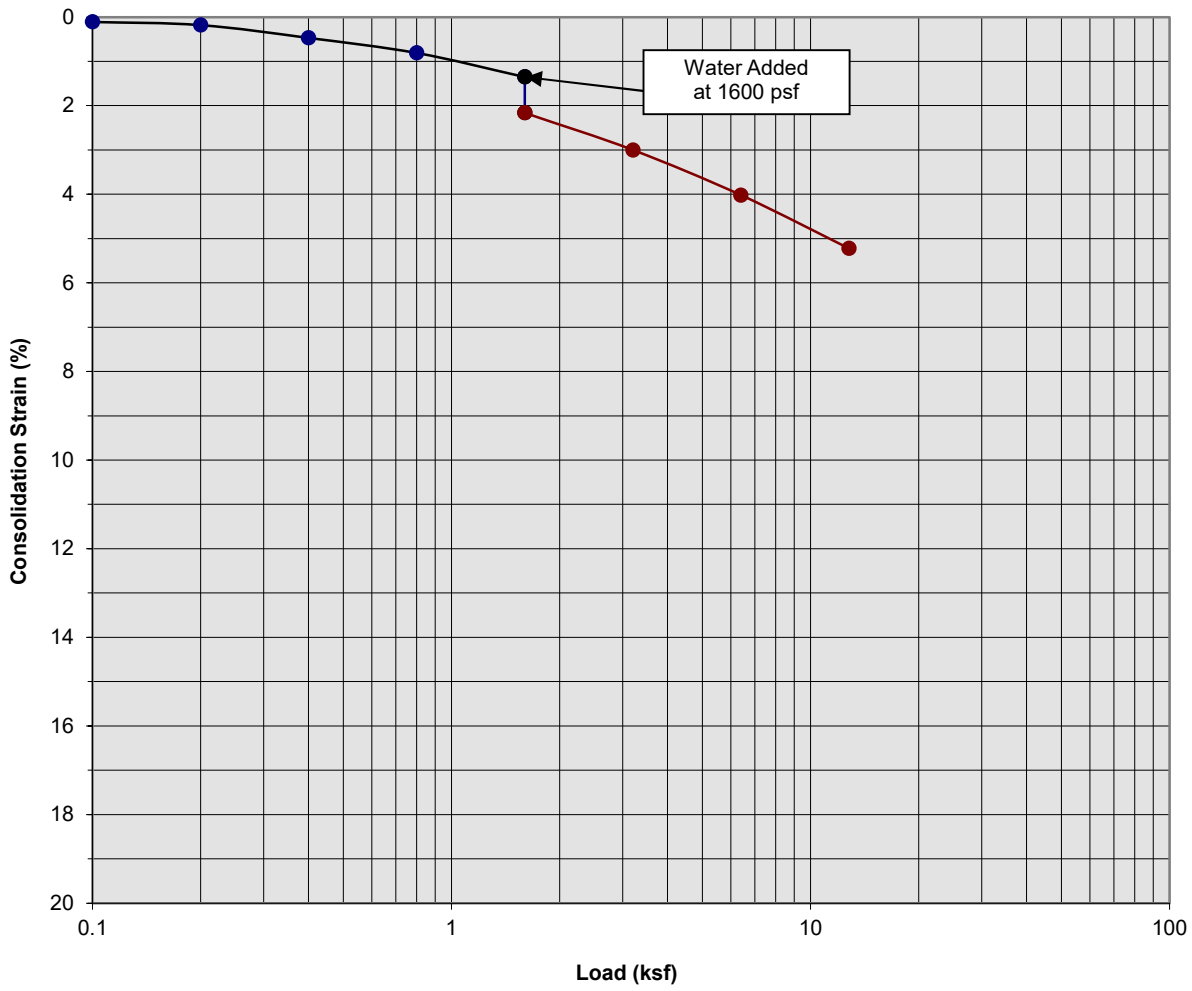
Boring Number:	B-4	Initial Moisture Content (%)	18
Sample Number:	---	Final Moisture Content (%)	19
Depth (ft)	7 to 8	Initial Dry Density (pcf)	108.1
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	114.7
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.10

Proposed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-1

PLATE C- 7

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: TERRACE: Light Brown fine Sand, trace Silt

Boring Number:	B-4	Initial Moisture Content (%)	5
Sample Number:	---	Final Moisture Content (%)	22
Depth (ft)	9 to 10	Initial Dry Density (pcf)	97.4
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	102.1
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.81

Proposed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-1

PLATE C- 8

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
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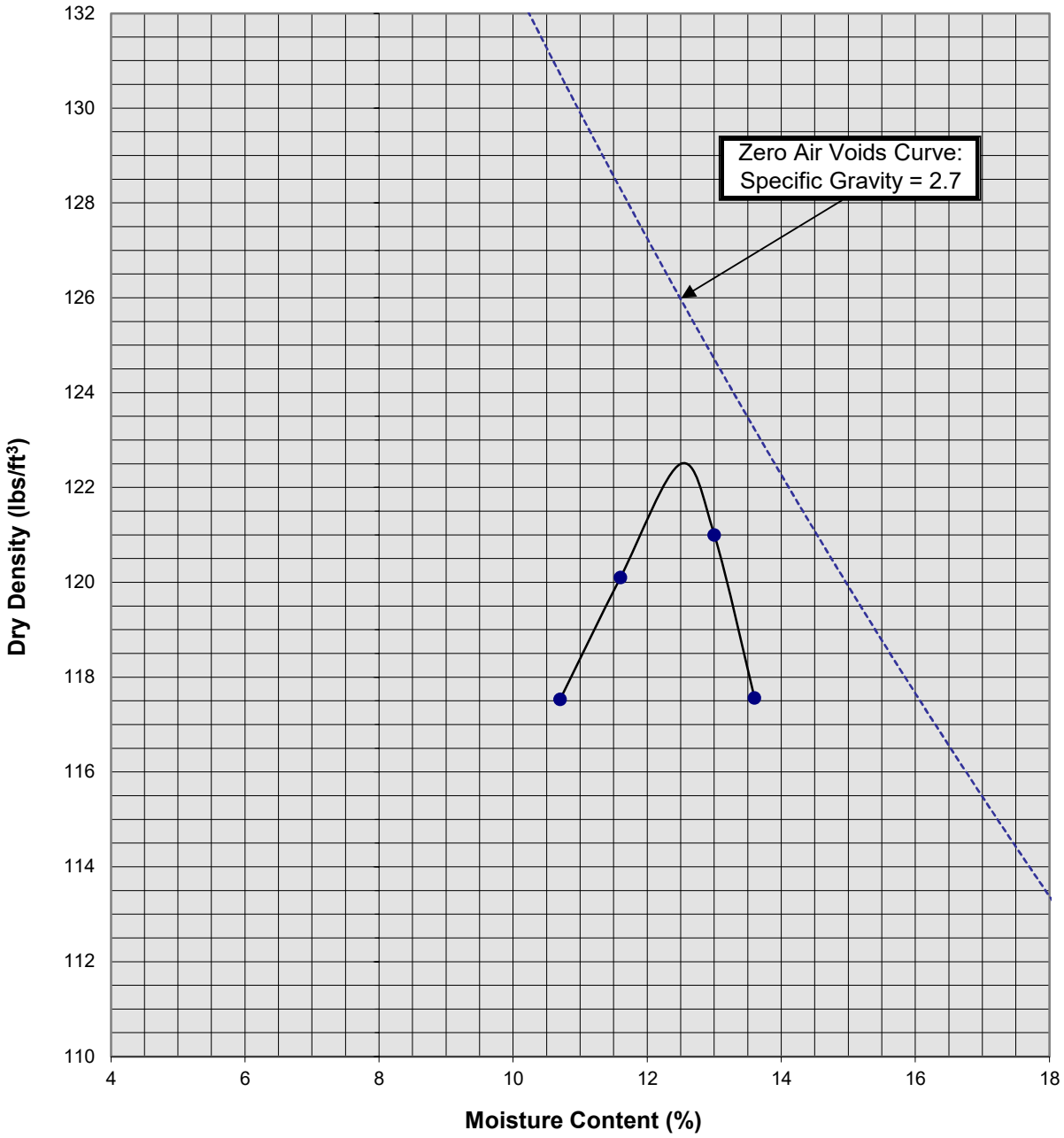
Moisture/Density Relationship
ASTM D-1557



Soil ID Number	B-1 @ 0-5'
Optimum Moisture (%)	12.5
Maximum Dry Density (pcf)	122.5
Soil Classification	Brown fine Sandy Clay trace to little Calcareous Nodules

Proposed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-1

PLATE C-9

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

APPENDIX D

GRADING GUIDE SPECIFICATIONS

These grading guide specifications are intended to provide typical procedures for grading operations. They are intended to supplement the recommendations contained in the geotechnical investigation report for this project. Should the recommendations in the geotechnical investigation report conflict with the grading guide specifications, the more site specific recommendations in the geotechnical investigation report will govern.

General

- The Earthwork Contractor is responsible for the satisfactory completion of all earthwork in accordance with the plans and geotechnical reports, and in accordance with city, county, and applicable building codes.

- The Geotechnical Engineer is the representative of the Owner/Builder for the purpose of implementing the report recommendations and guidelines. These duties are not intended to relieve the Earthwork Contractor of any responsibility to perform in a workman-like manner, nor is the Geotechnical Engineer to direct the grading equipment or personnel employed by the Contractor.

- The Earthwork Contractor is required to notify the Geotechnical Engineer of the anticipated work and schedule so that testing and inspections can be provided. If necessary, work may be stopped and redone if personnel have not been scheduled in advance.

- The Earthwork Contractor is required to have suitable and sufficient equipment on the job-site to process, moisture condition, mix and compact the amount of fill being placed to the approved compaction. In addition, suitable support equipment should be available to conform with recommendations and guidelines in this report.

- Canyon cleanouts, overexcavation areas, processed ground to receive fill, key excavations, subdrains and benches should be observed by the Geotechnical Engineer prior to placement of any fill. It is the Earthwork Contractor's responsibility to notify the Geotechnical Engineer of areas that are ready for inspection.

- Excavation, filling, and subgrade preparation should be performed in a manner and sequence that will provide drainage at all times and proper control of erosion. Precipitation, springs, and seepage water encountered shall be pumped or drained to provide a suitable working surface. The Geotechnical Engineer must be informed of springs or water seepage encountered during grading or foundation construction for possible revision to the recommended construction procedures and/or installation of subdrains.

Site Preparation

- The Earthwork Contractor is responsible for all clearing, grubbing, stripping and site preparation for the project in accordance with the recommendations of the Geotechnical Engineer.

- If any materials or areas are encountered by the Earthwork Contractor which are suspected of having toxic or environmentally sensitive contamination, the Geotechnical Engineer and Owner/Builder should be notified immediately.

- Major vegetation should be stripped and disposed of off-site. This includes trees, brush, heavy grasses and any materials considered unsuitable by the Geotechnical Engineer.

- Underground structures such as basements, cesspools or septic disposal systems, mining shafts, tunnels, wells and pipelines should be removed under the inspection of the Geotechnical Engineer and recommendations provided by the Geotechnical Engineer and/or city, county or state agencies. If such structures are known or found, the Geotechnical Engineer should be notified as soon as possible so that recommendations can be formulated.

- Any topsoil, slopewash, colluvium, alluvium and rock materials which are considered unsuitable by the Geotechnical Engineer should be removed prior to fill placement.

- Remaining voids created during site clearing caused by removal of trees, foundations basements, irrigation facilities, etc., should be excavated and filled with compacted fill.

- Subsequent to clearing and removals, areas to receive fill should be scarified to a depth of 10 to 12 inches, moisture conditioned and compacted

- The moisture condition of the processed ground should be at or slightly above the optimum moisture content as determined by the Geotechnical Engineer. Depending upon field conditions, this may require air drying or watering together with mixing and/or discing.

Compacted Fills

- Soil materials imported to or excavated on the property may be utilized in the fill, provided each material has been determined to be suitable in the opinion of the Geotechnical Engineer. Unless otherwise approved by the Geotechnical Engineer, all fill materials shall be free of deleterious, organic, or frozen matter, shall contain no chemicals that may result in the material being classified as "contaminated," and shall be very low to non-expansive with a maximum expansion index (EI) of 50. The top 12 inches of the compacted fill should have a maximum particle size of 3 inches, and all underlying compacted fill material a maximum 6-inch particle size, except as noted below.

- All soils should be evaluated and tested by the Geotechnical Engineer. Materials with high expansion potential, low strength, poor gradation or containing organic materials may require removal from the site or selective placement and/or mixing to the satisfaction of the Geotechnical Engineer.

- Rock fragments or rocks less than 6 inches in their largest dimensions, or as otherwise determined by the Geotechnical Engineer, may be used in compacted fill, provided the distribution and placement is satisfactory in the opinion of the Geotechnical Engineer.

- Rock fragments or rocks greater than 12 inches should be taken off-site or placed in accordance with recommendations and in areas designated as suitable by the Geotechnical Engineer. These materials should be placed in accordance with Plate D-8 of these Grading Guide Specifications and in accordance with the following recommendations:

    - Rocks 12 inches or more in diameter should be placed in rows at least 15 feet apart, 15 feet from the edge of the fill, and 10 feet or more below subgrade. Spaces should be left between each rock fragment to provide for placement and compaction of soil around the fragments.

    - Fill materials consisting of soil meeting the minimum moisture content requirements and free of oversize material should be placed between and over the rows of rock or

concrete. Ample water and compactive effort should be applied to the fill materials as they are placed in order that all of the voids between each of the fragments are filled and compacted to the specified density.

- Subsequent rows of rocks should be placed such that they are not directly above a row placed in the previous lift of fill. A minimum 5-foot offset between rows is recommended.

- To facilitate future trenching, oversized material should not be placed within the range of foundation excavations, future utilities or other underground construction unless specifically approved by the soil engineer and the developer/owner representative.

- Fill materials approved by the Geotechnical Engineer should be placed in areas previously prepared to receive fill and in evenly placed, near horizontal layers at about 6 to 8 inches in loose thickness, or as otherwise determined by the Geotechnical Engineer for the project.

- Each layer should be moisture conditioned to optimum moisture content, or slightly above, as directed by the Geotechnical Engineer. After proper mixing and/or drying, to evenly distribute the moisture, the layers should be compacted to at least 90 percent of the maximum dry density in compliance with ASTM D-1557-78 unless otherwise indicated.

- Density and moisture content testing should be performed by the Geotechnical Engineer at random intervals and locations as determined by the Geotechnical Engineer. These tests are intended as an aid to the Earthwork Contractor, so he can evaluate his workmanship, equipment effectiveness and site conditions. The Earthwork Contractor is responsible for compaction as required by the Geotechnical Report(s) and governmental agencies.

- Fill areas unused for a period of time may require moisture conditioning, processing and recompaction prior to the start of additional filling. The Earthwork Contractor should notify the Geotechnical Engineer of his intent so that an evaluation can be made.

- Fill placed on ground sloping at a 5-to-1 inclination (horizontal-to-vertical) or steeper should be benched into bedrock or other suitable materials, as directed by the Geotechnical Engineer. Typical details of benching are illustrated on Plates D-2, D-4, and D-5.

- Cut/fill transition lots should have the cut portion overexcavated to a depth of at least 3 feet and rebuilt with fill (see Plate D-1), as determined by the Geotechnical Engineer.

- All cut lots should be inspected by the Geotechnical Engineer for fracturing and other bedrock conditions. If necessary, the pads should be overexcavated to a depth of 3 feet and rebuilt with a uniform, more cohesive soil type to impede moisture penetration.

- Cut portions of pad areas above buttresses or stabilizations should be overexcavated to a depth of 3 feet and rebuilt with uniform, more cohesive compacted fill to impede moisture penetration.

- Non-structural fill adjacent to structural fill should typically be placed in unison to provide lateral support. Backfill along walls must be placed and compacted with care to ensure that excessive unbalanced lateral pressures do not develop. The type of fill material placed adjacent to below grade walls must be properly tested and approved by the Geotechnical Engineer with consideration of the lateral earth pressure used in the design.

Foundations

- The foundation influence zone is defined as extending one foot horizontally from the outside edge of a footing, and proceeding downward at a ½ horizontal to 1 vertical (0.5:1) inclination.

- Where overexcavation beneath a footing subgrade is necessary, it should be conducted so as to encompass the entire foundation influence zone, as described above.

- Compacted fill adjacent to exterior footings should extend at least 12 inches above foundation bearing grade. Compacted fill within the interior of structures should extend to the floor subgrade elevation.

Fill Slopes

- The placement and compaction of fill described above applies to all fill slopes. Slope compaction should be accomplished by overfilling the slope, adequately compacting the fill in even layers, including the overfilled zone and cutting the slope back to expose the compacted core

- Slope compaction may also be achieved by backrolling the slope adequately every 2 to 4 vertical feet during the filling process as well as requiring the earth moving and compaction equipment to work close to the top of the slope. Upon completion of slope construction, the slope face should be compacted with a sheepsfoot connected to a sideboom and then grid rolled. This method of slope compaction should only be used if approved by the Geotechnical Engineer.

- Sandy soils lacking in adequate cohesion may be unstable for a finished slope condition and therefore should not be placed within 15 horizontal feet of the slope face.

- All fill slopes should be keyed into bedrock or other suitable material. Fill keys should be at least 15 feet wide and inclined at 2 percent into the slope. For slopes higher than 30 feet, the fill key width should be equal to one-half the height of the slope (see Plate D-5).

- All fill keys should be cleared of loose slough material prior to geotechnical inspection and should be approved by the Geotechnical Engineer and governmental agencies prior to filling.

- The cut portion of fill over cut slopes should be made first and inspected by the Geotechnical Engineer for possible stabilization requirements. The fill portion should be adequately keyed through all surficial soils and into bedrock or suitable material. Soils should be removed from the transition zone between the cut and fill portions (see Plate D-2).

Cut Slopes

- All cut slopes should be inspected by the Geotechnical Engineer to determine the need for stabilization. The Earthwork Contractor should notify the Geotechnical Engineer when slope cutting is in progress at intervals of 10 vertical feet. Failure to notify may result in a delay in recommendations.

- Cut slopes exposing loose, cohesionless sands should be reported to the Geotechnical Engineer for possible stabilization recommendations.

- All stabilization excavations should be cleared of loose slough material prior to geotechnical inspection. Stakes should be provided by the Civil Engineer to verify the location and dimensions of the key. A typical stabilization fill detail is shown on Plate D-5.

- Stabilization key excavations should be provided with subdrains. Typical subdrain details are shown on Plates D-6.

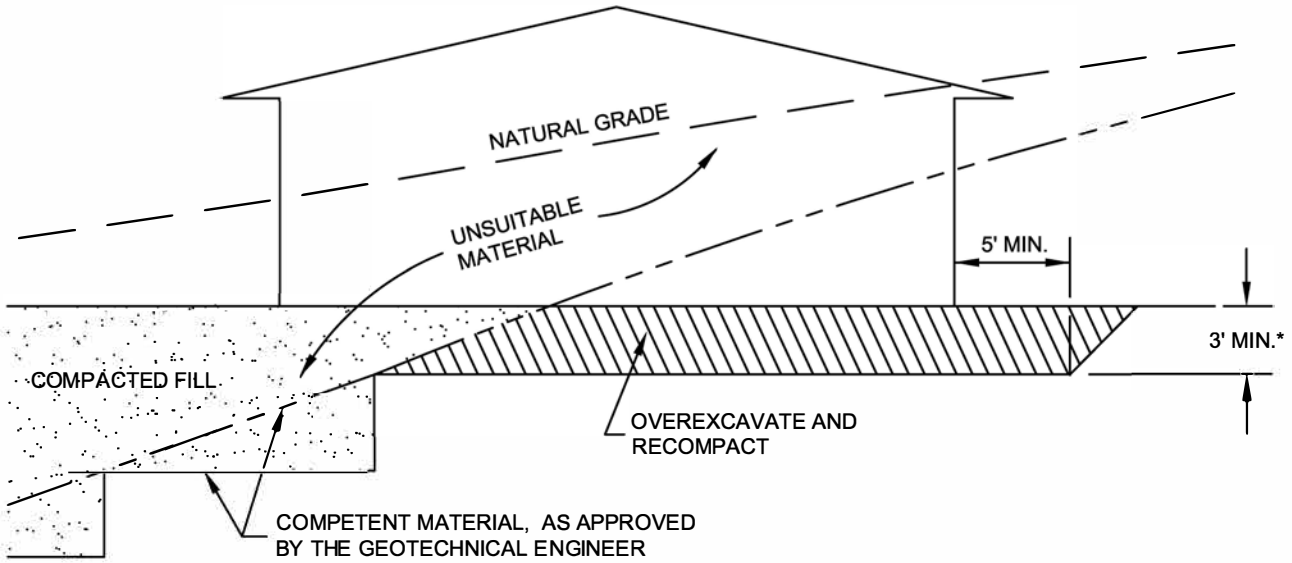
Subdrains

- Subdrains may be required in canyons and swales where fill placement is proposed. Typical subdrain details for canyons are shown on Plate D-3. Subdrains should be installed after approval of removals and before filling, as determined by the Soils Engineer.

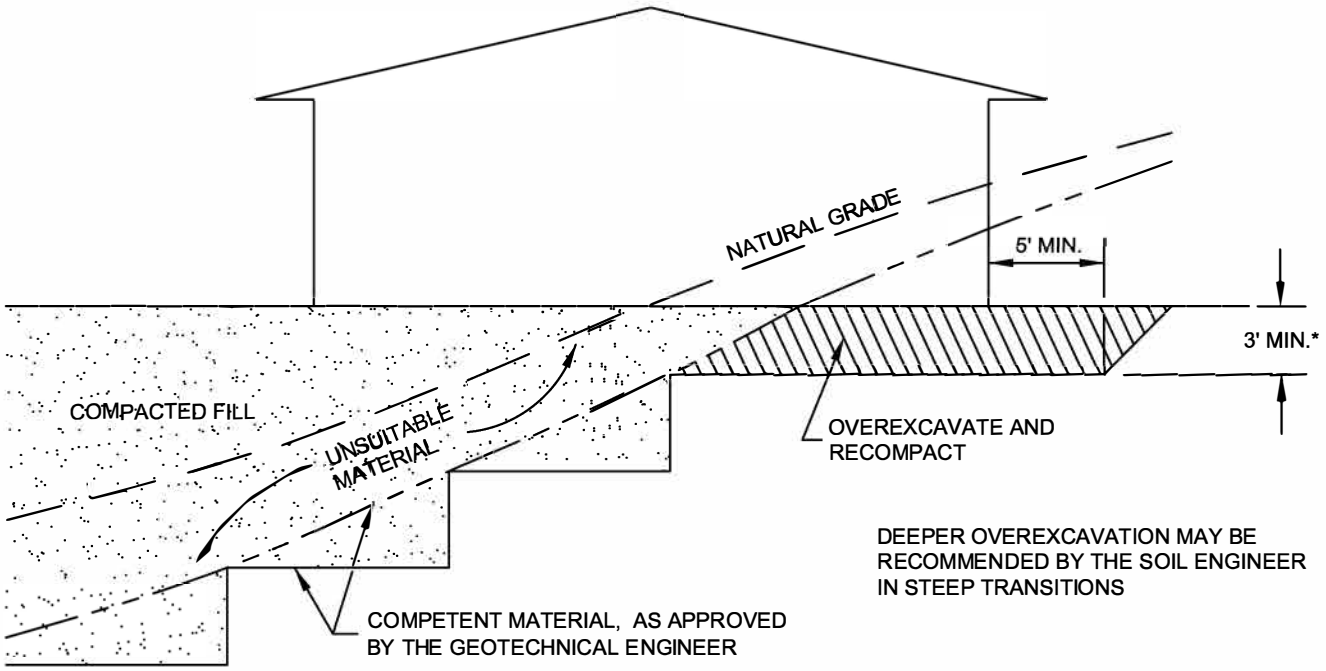
- Plastic pipe may be used for subdrains provided it is Schedule 40 or SDR 35 or equivalent. Pipe should be protected against breakage, typically by placement in a square-cut (backhoe) trench or as recommended by the manufacturer.

- Filter material for subdrains should conform to CALTRANS Specification 68-1.025 or as approved by the Geotechnical Engineer for the specific site conditions. Clean ¾-inch crushed rock may be used provided it is wrapped in an acceptable filter cloth and approved by the Geotechnical Engineer. Pipe diameters should be 6 inches for runs up to 500 feet and 8 inches for the downstream continuations of longer runs. Four-inch diameter pipe may be used in buttress and stabilization fills.

CUT LOT



CUT/FILL LOT (TRANSITION)



*SEE TEXT OF REPORT FOR SPECIFIC RECOMMENDATION. ACTUAL DEPTH OF OVEREXCAVATION MAY BE GREATER.

TRANSITION LOT DETAIL

GRADING GUIDE SPECIFICATIONS

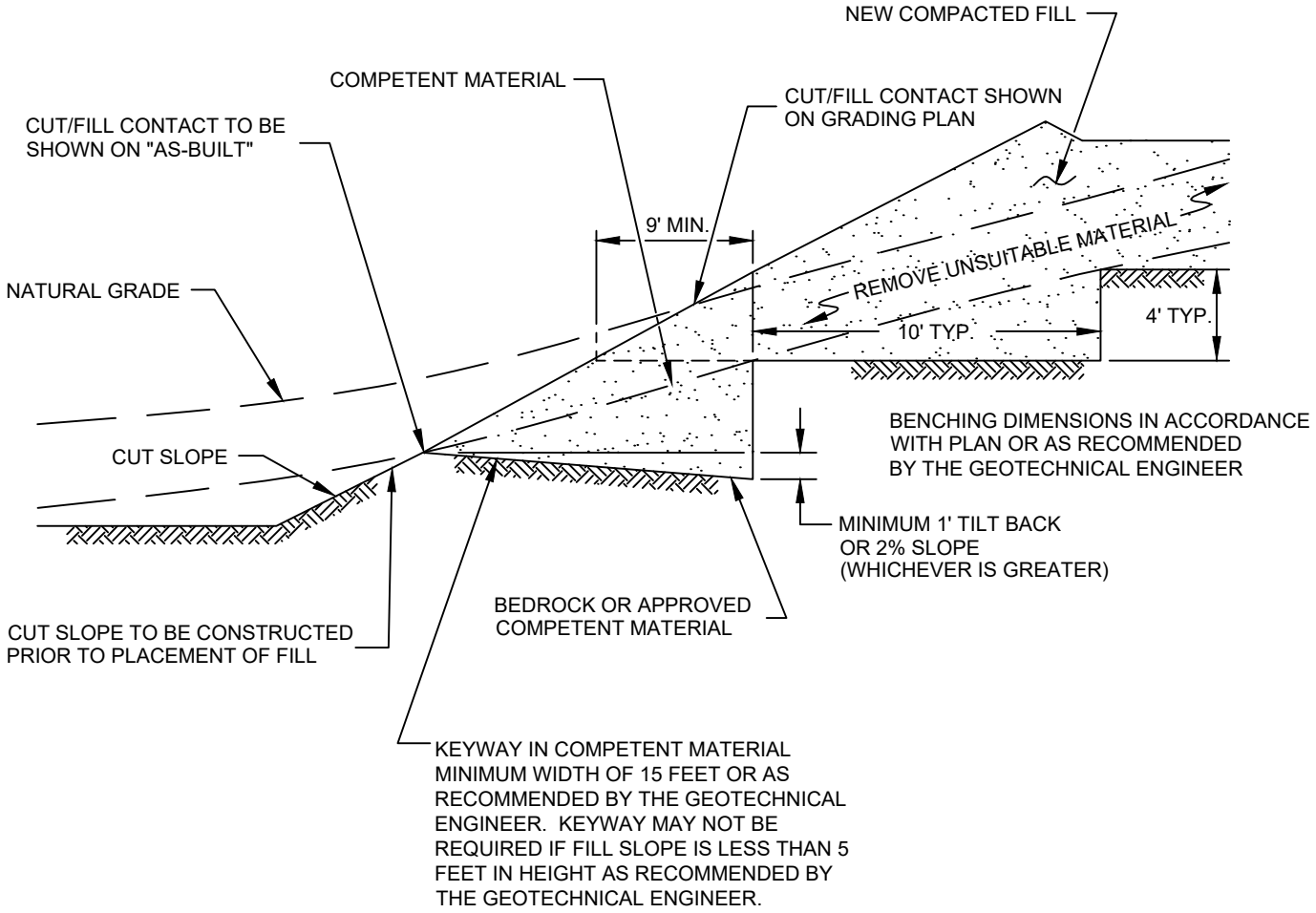
NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-1

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



FILL ABOVE CUT SLOPE DETAIL

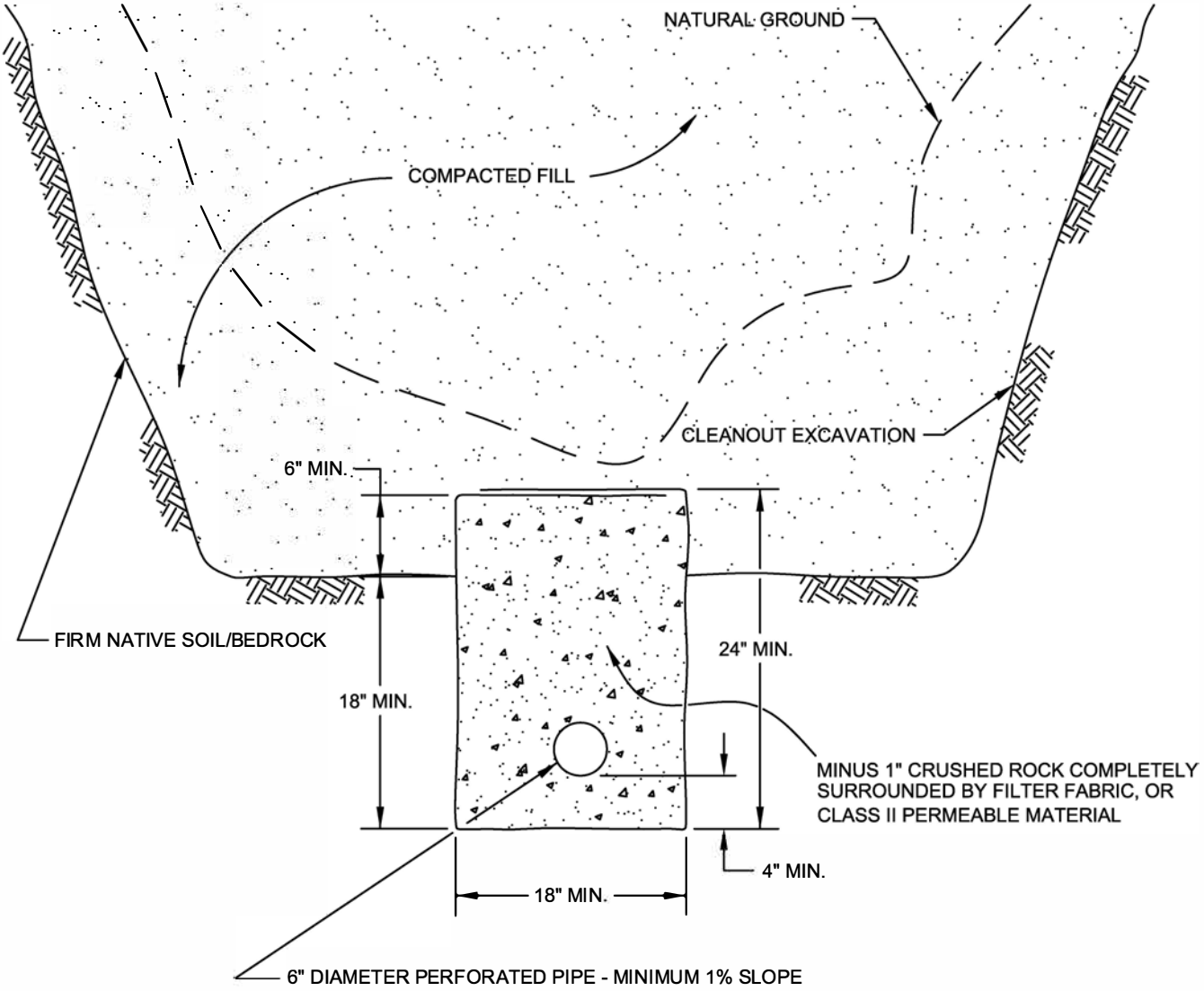
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



PIPE MATERIAL	DEPTH OF FILL OVER SUBDRAIN
ADS (CORRUGATED POLETHYLENE)	8
TRANSITE UNDERDRAIN	20
PVC OR ABS: SDR 35	35
SDR 21	100

SCHEMATIC ONLY
NOT TO SCALE

CANYON SUBDRAIN DETAIL

GRADING GUIDE SPECIFICATIONS

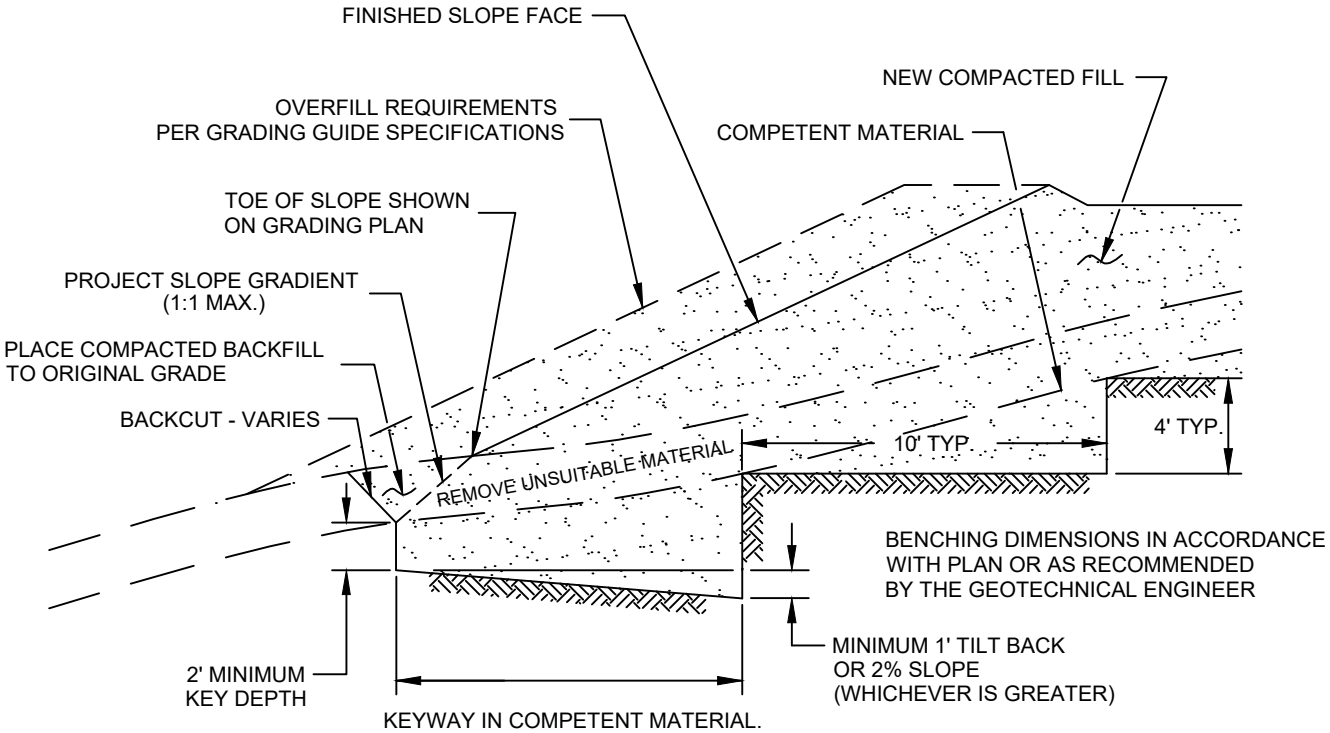
NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-3

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



NOTE:
BENCHING SHALL BE REQUIRED WHEN NATURAL SLOPES ARE EQUAL TO OR STEEPER THAN 5:1 OR WHEN RECOMMENDED BY THE GEOTECHNICAL ENGINEER.

FILL ABOVE NATURAL SLOPE DETAIL

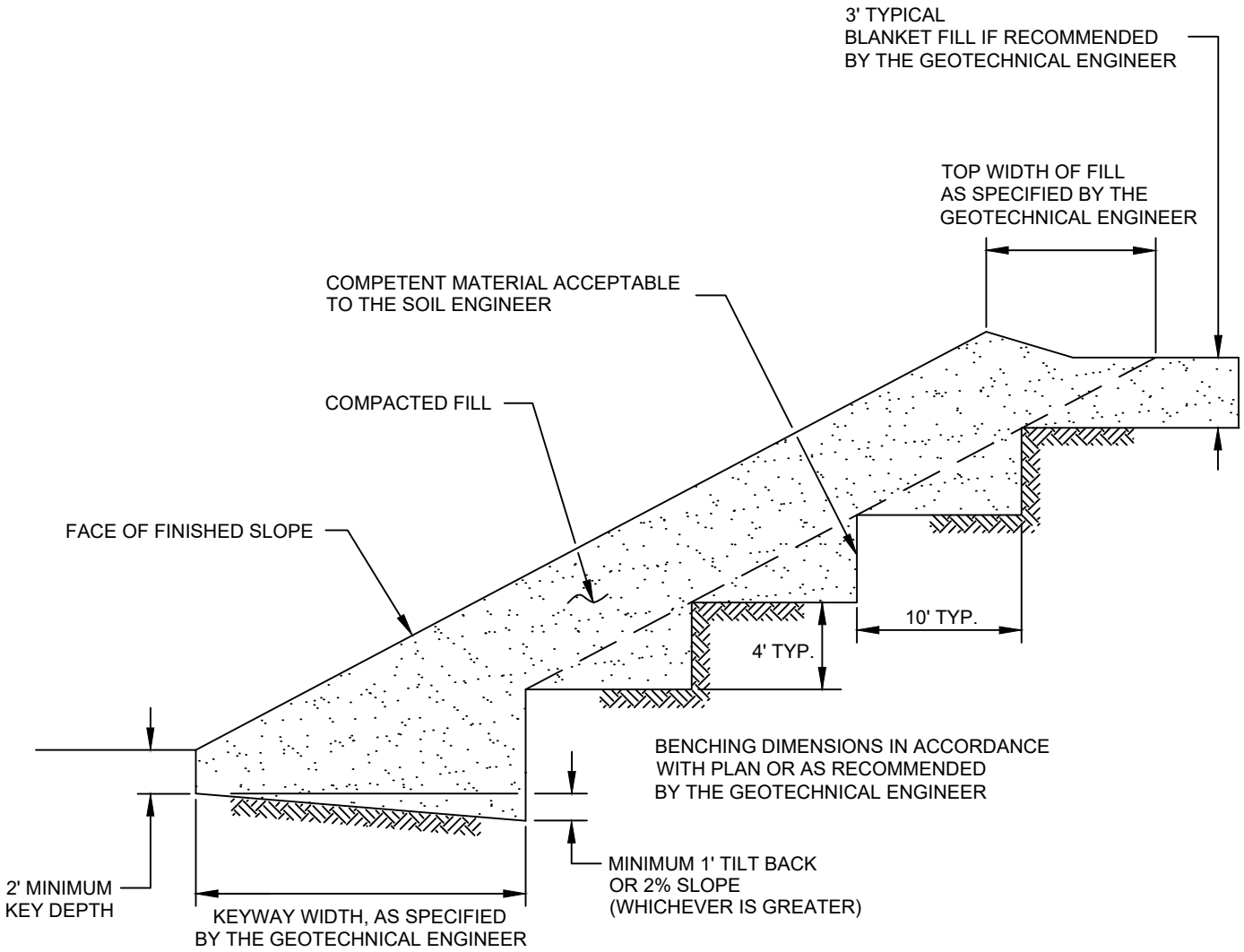
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-4

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



STABILIZATION FILL DETAIL

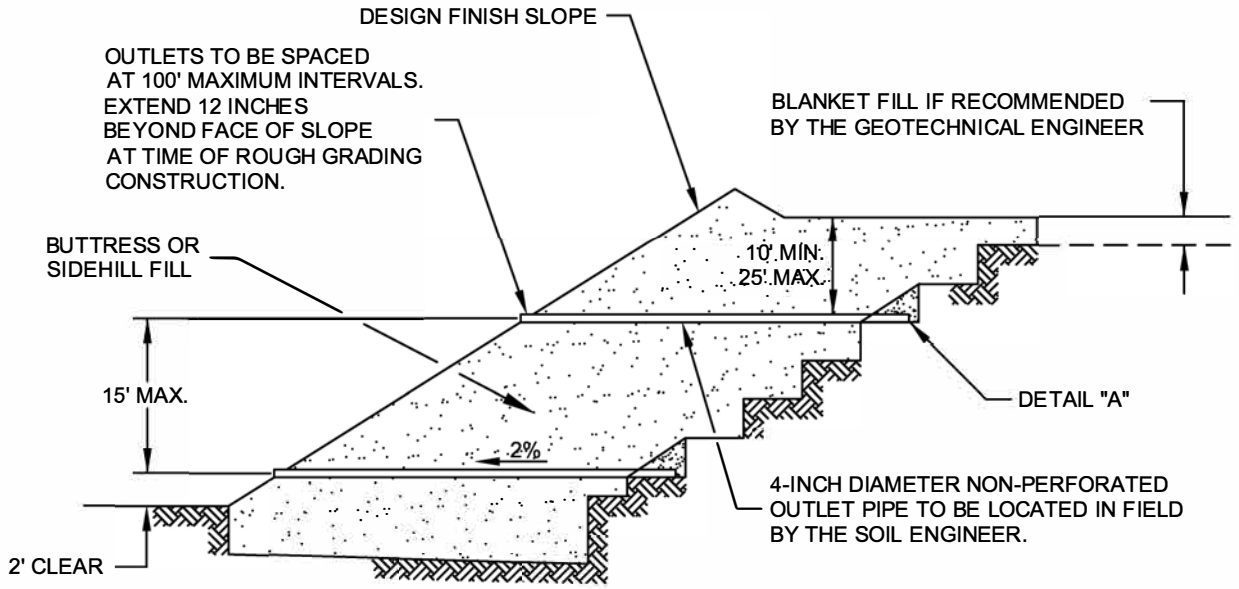
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-5

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



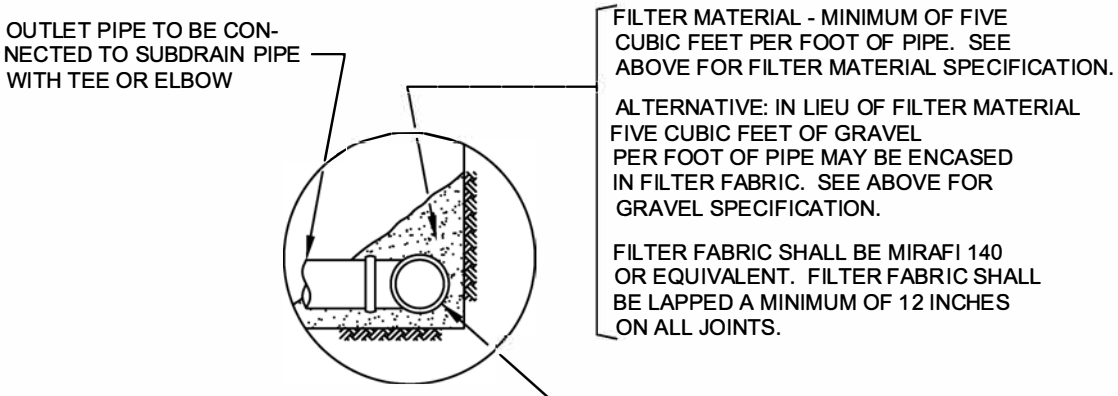
"FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT: (CONFORMS TO EMA STD. PLAN 323)

SIEVE SIZE	PERCENTAGE PASSING
1"	100
3/4"	90-100
3/8"	40-100
NO. 4	25-40
NO. 8	18-33
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

"GRAVEL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT:

SIEVE SIZE	MAXIMUM PERCENTAGE PASSING
1 1/2"	100
NO. 4	50
NO. 200	8

SAND EQUIVALENT = MINIMUM OF 50



DETAIL "A"

NOTES:
1. TRENCH FOR OUTLET PIPES TO BE BACKFILLED WITH ON-SITE SOIL.

SLOPE FILL SUBDRAINS

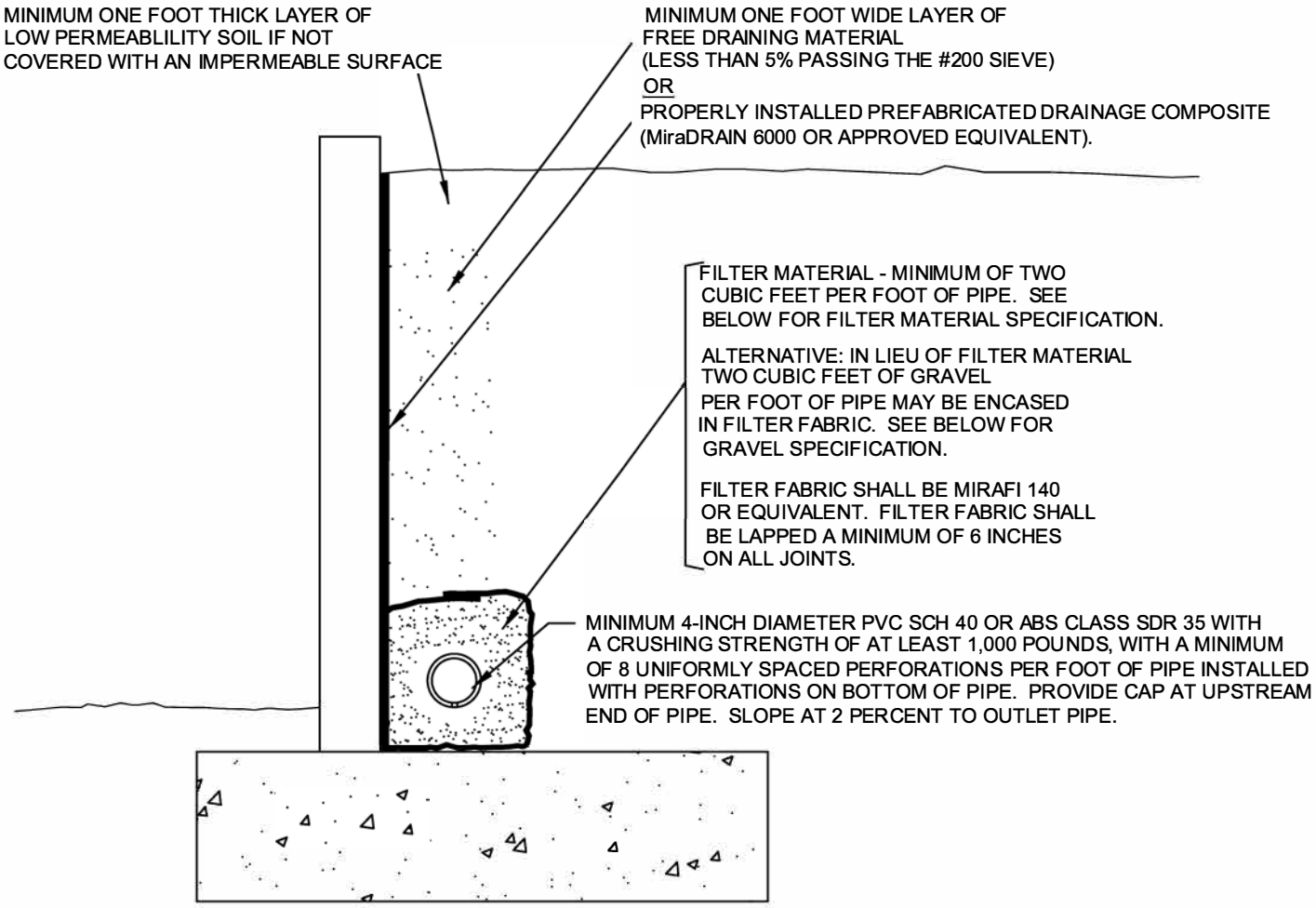
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-6

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



"FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT: (CONFORMS TO EMA STD. PLAN 323)

SIEVE SIZE	PERCENTAGE PASSING
1"	100
3/4"	90-100
3/8"	40-100
NO. 4	25-40
NO. 8	18-33
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

"GRAVEL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT:

SIEVE SIZE	MAXIMUM PERCENTAGE PASSING
1 1/2"	100
NO. 4	50
NO. 200	8

SAND EQUIVALENT = MINIMUM OF 50

RETAINING WALL BACKDRAINS

GRADING GUIDE SPECIFICATIONS

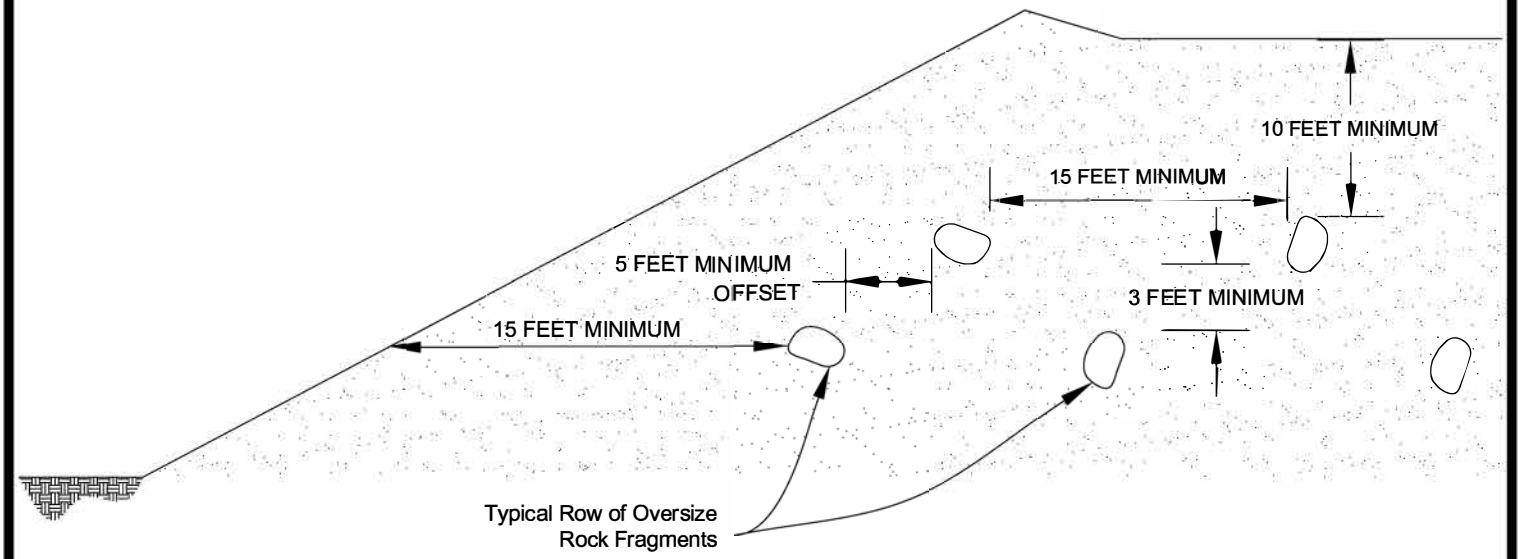
NOT TO SCALE

DRAWN: JAS
CHKD: GKM

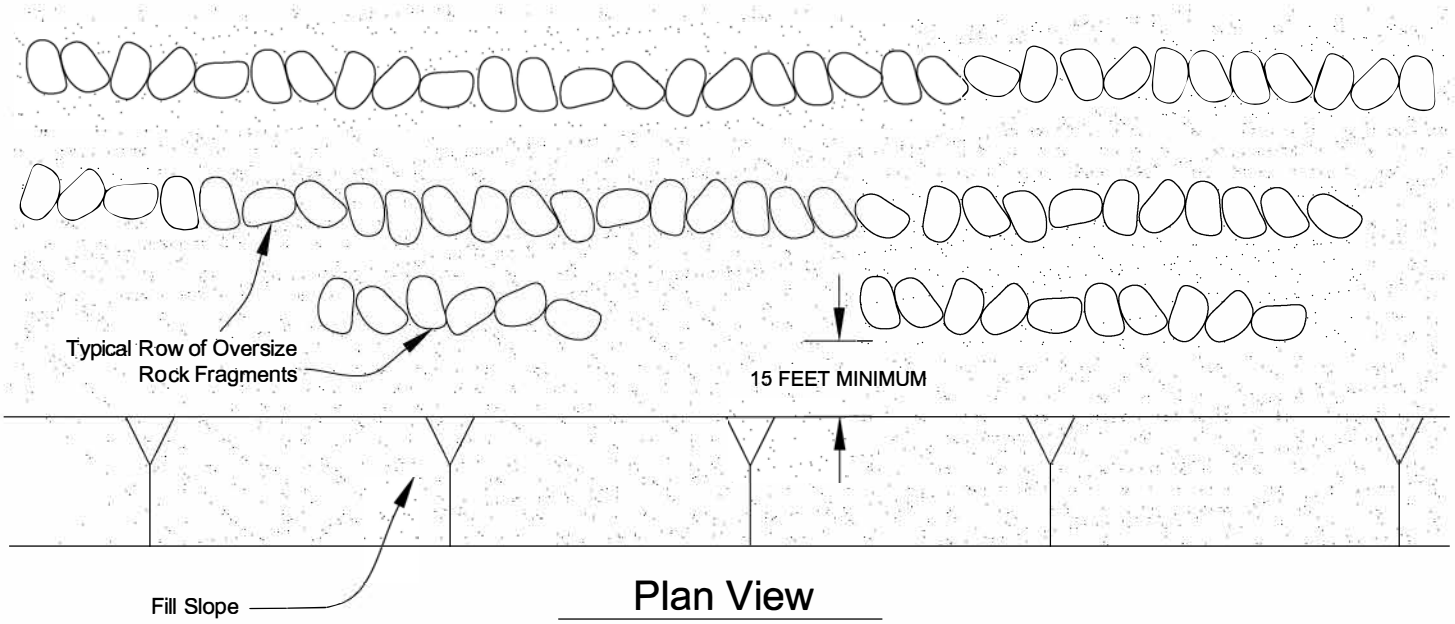
PLATE D-7

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



Section View



Plan View

PLACEMENT OF OVERSIZED MATERIAL

GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: PM
CHKD: GKM

PLATE D-8

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL

APPENDIX E

OSHPD

Latitude, Longitude: 33.912569, -117.882562

Date	7/20/2020, 1:24:10 PM
Design Code Reference Document	ASCE7-16
Risk Category	III
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.803	MCE_R ground motion. (for 0.2 second period)
S_1	0.634	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.803	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.202	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.781	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.86	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.803	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.001	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.21	Factored deterministic acceleration value. (0.2 second)
S1RT	0.634	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.702	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.858	Factored deterministic acceleration value. (1.0 second)
PGAd	0.92	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.901	Mapped value of the risk coefficient at short periods
C_{R1}	0.903	Mapped value of the risk coefficient at a period of 1 s

SOURCE: SEAOC/OSHPD Seismic Design Maps Tool
<https://seismicmaps.org/>

SEISMIC DESIGN PARAMETERS - 2019 CBC

PROPOSED BREA PLAZA MIXED USE

BREA, CALIFORNIA

DRAWN: JAH
CHKD: DN

SCG PROJECT
20G168-1

PLATE E-1

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL

APPENDIX F

TABLE C-1
SUMMARY OF LABORATORY TEST DATA
W.O. 500690

BORING	DEPTH (FEET)	SOIL DESCRIPTION	GROUP SYMBOL	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)	DIRECT SHEAR	PLUS NO.4 SEIVE (plus 4.76mm) (%)	SAND (4.76mm-0.075mm) (%)	SILT (0.075mm-0.005mm) (%)	CLAY (minus 0.005mm) (%)	EXPANSION INDEX UBC 18-2	OTHER TESTS REMARKS
HS-01	15	Artificial Fill, Engineered (afe): Sandy Clay	CL				0	30	23	47		
HS-03	1	Artificial Fill, Engineered (afe): Sandy Clay	CL	121.5	9.8		4	46	23	27	45	
HS-03	10	Terrace Deposits (Qt): Sandy Clay	CL				0	31	27	42		
HS-04	10	Terrace Deposits (Qt): Silty Sand	SM				0	78	12	10		
HS-05	20	Terrace Deposits (Qt): Silty Sand	SM				0	84	8	8		
HS-06	7.5	Artificial Fill, Engineered (afe): Sandy Clay	CL			SEE PLATE C-14	0	45	22	33		
HS-06	15	Artificial Fill, Engineered (afe): Sandy Clay	CL				0	43	28	29		
HS-06	25	Terrace Deposits (Qt): Sand with Silt	SP-SM				0	90	3	7		Atterberg Limits- Non Plastic
HS-07	1	Terrace Deposits (Qt): Clayey Sand	SC				0	51	32	28	46	
HS-07	5	Terrace Deposits (Qt): Clayey Sand	SC				0	75	12	13		
HS-07	30	Terrace Deposits (Qt): Clayey Silt	ML				0	15	60	25		
HS-08	4	Artificial Fill, Engineered (afe): Sandy Clay	CL	123.3	10.8		1	49	21	29	35	
HS-08	5	Artificial Fill, Engineered (afe): Sandy Clay	CL			SEE PLATE C-14	0	45	23	32		
HS-08	10	Terrace Deposits (Qt): Clayey Sand	SC				0	55	15	30		
HS-09	8.5	Alluvium (Qal): Clayey Silt	ML				0	36	28	36		
HS-09	10	Alluvium (Qal): Clayey Silt	ML				0	23	45	32		
HS-09	15	Alluvium (Qal): Clayey Sand	SC				0	70	15	15		
HS-09	20	Alluvium (Qal): Sandy Clay	CL				0	42	32	26		Atterberg Limits- Plate C-16
HS-09	30	Terrace Deposits (Qt): Clayey Sand	SC				0	60	18	22		
HS-10	7.5	Alluvium (Qal): Clay	CL				0	27	43	30		
HS-10	13	Alluvium (Qal): Sandy Clay	CL				0	41	29	30		Atterberg Limits- Plate C-16
HS-10	15	Alluvium (Qal): Clayey Sand	SC				0	58	23	19		

TABLE C-1
SUMMARY OF LABORATORY TEST DATA
W.O. 500690

BORING	DEPTH (FEET)	SOIL DESCRIPTION	GROUP SYMBOL	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)	DIRECT SHEAR	PLUS NO.4 SEIVE (plus 4.76mm) (%)	SAND (4.76mm-0.075mm) (%)	SILT (0.075mm-0.005mm) (%)	CLAY (minus 0.005mm) (%)	EXPANSION INDEX UBC 18-2	OTHER TESTS REMARKS
HS-10	20	Alluvium (Qal): Silty Sand	SM				0	78	10	12		
HS-10	30	Terrace Deposits (Qt): Sand with Silt	SP-SM				0	92	2	6		
HS-10	45	Terrace Deposits (Qt): Silty Sand	SM				0	52	30	18		
HS-11	7.5	Artificial Fill, Engineered (afe): Silty Clay	CL-ML				0	43	32	25		
HS-11	10	Alluvium (Qal): Clayey Sand	SC				0	50	30	20		
HS-11	11	Alluvium (Qal): Silty Clay	CL-ML				0	29	40	31		
HS-11	15	Alluvium (Qal): Silty Clay	CL-ML				0	36	32	32		
HS-11	20	Alluvium (Qal): Clayey Sand	SC			SEE PLATE C-15	0	62	25	13		
HS-11	25	Alluvium (Qal): Sandy Clay	CL				0	50	27	23		
HS-11	26	Alluvium (Qal): Silty Sand	SM				0	80	7	13		
HS-12	15	Alluvium (Qal): Silty Clay	CL-ML				0	37	33	30		
HS-12	20	Alluvium (Qal): Clayey Sand	SC				9	52	21	18		Atterberg Limits- Plate C-16
HS-13	7.5	Alluvium (Qal): Silty Clay	CL-ML				0	28	38	34		
HS-13	15	Alluvium (Qal): Silty Sand	SM				0	66	17	17		
HS-13	20	Terrace Deposits (Qt): Clayey Silt	ML				0	17	40	43		

of selected samples were evaluated by KYH Co., Analytical Laboratory. The results of these tests are included in the following table.

CHEMICAL TEST RESULTS				
Sample	**Sulfate Content (% wt.)***	**Chloride Content (% wt.)***	**pH**	**Resistivity (ohm-cm)**
HS-9 @ 7-10 feet	0.008	0.025	7.3	670
HS-10 @ 13 feet	<0.001	0.007	7.1	1,000
HS-11 @ 10-15 feet	<0.001	0.003	7.5	1,530
HS-12 @ 10-15 feet	0.009	0.004	7.4	1,160
*Sulfate Content and Chloride Content tests provided by KYH Co. Analytical Laboratory, Santa Ana, California				

GEOTECHNICAL BORING LOG

PROJECT NO.	500690	PROJECT NAME	Brea Plaza	BORING DESIG.	HS-03
DATE STARTED	10/22/07	GROUND ELEV.	329	LOGGED BY	SJD
DATE FINISHED	10/22/07	GW DEPTH (FT)	26	DRIVE WT.	140 lbs.
DRILLER	Martini	DROP	30 in.		
TYPE OF DRILL RIG	6" HSA				

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
						6" Asphalt Concrete over 2" Silty Gravel				
					CL	ARTIFICIAL FILL, ENGINEERED (afe): SANDY CLAY, sand is fine to coarse-grained, brown to orangish brown, slightly moist				MAX El HY
		B				@ 3 ft. - moist, firm				
	325									
5		R	15			@ 5 ft. - some rounded gravel, moist to very moist, firm	20.0	99	79	
		R	21			@ 7.5 ft. - mottled, dark brown and brown, moist, firm	17.1	111	94	
	320					@ 8.5 ft. - dark brown, moist, firm, trace caliche, stringers are broken up (disturbed- fill)				
10		R	30		CL	TERRACE DEPOSITS (Qt): SANDY CLAY, dark brown, trace caliche, moist, stiff	15.6	115	95	CON HY
		S	5,5,7			@ 12.5 ft. - slightly mottled, dark brown to dark grayish, brown, trace orangish brown staining, moist, stiff				
	315									
15		R	38				14.9	116	92	
	310									
20		R	37			@ 20 ft. - slightly mottled, dark brown, brown, orangish brown, moist, stiff	15.9	114	94	
					ML	@ 21 ft. - SANDY SILT, sand is fine-grained, orangish brown, moist, stiff				
	305									
25		S	4,7,9		CL	@ 25 ft. - SANDY CLAY, sand is fine to medium-grained, orangish brown with some grayish brown layers, moist, stiff				
	300									
30		R	56		SC	@ 30 ft. - CLAYEY SAND, fine to coarse-grained, trace gravel, orangish brown, wet, dense	15.8	113	90	
						TOTAL DEPTH 31.5 FEET GROUNDWATER ENCOUNTERED AT 26.3 FEET				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

GROUNDWATER
SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE B-3

GEOTECHNICAL BORING LOG

PROJECT NO.	500690	PROJECT NAME	Brea Plaza	BORING DESIG.	HS-04
DATE STARTED	10/22/07	GROUND ELEV.	331	LOGGED BY	SJD
DATE FINISHED	10/22/07	GW DEPTH (FT)		DRIVE WT.	140 lbs.
DRILLER	Martini	DROP	30 in.		
TYPE OF DRILL RIG	6" HSA				

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
						4" Asphalt Concrete over 3" Base				
	330				SC	ARTIFICIAL FILL, ENGINEERED (afe): CLAYEY SAND, fine to coarse-grained, orangish brown, moist, medium dense				
					SC	TERRACE DEPOSITS (Qt): CLAYEY SAND, fine to coarse-grained, orangish brown, moist, dense				
5	325	R	74			@ 5 ft. - slightly mottled, moist, very dense	12.4	119	84	
		R	89		SM	@ 7.5 ft. - SILTY SAND, fine-grained, orangish brown, slightly moist, very dense	7.3	102	31	
10	320	S	10,18,17			@ 10 ft. - finer grained, more silt, slightly moist, dense				HY
15	315	R	80			@ 15 ft. - some clay, slightly mottled, orangish brown, slightly moist, very dense	12.5	122	92	
20	310	S	10,9,10		ML	@ 20 ft. - SANDY SILT, sand is fine-grained, orangish brown, slightly moist, very stiff				
						TOTAL DEPTH 21.5 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- [R] RING (DRIVE) SAMPLE
- [S] SPT (SPLIT SPOON) SAMPLE
- [B] BULK SAMPLE
- [T] TUBE SAMPLE

GROUNDWATER
SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE B-4

GEOTECHNICAL BORING LOG

PROJECT NO.	500690	PROJECT NAME	Brea Plaza	BORING DESIG.	HS-05
DATE STARTED	10/22/07	GROUND ELEV.	333	LOGGED BY	SJD
DATE FINISHED	10/22/07	GW DEPTH (FT)		DRIVE WT.	140 lbs.
DRILLER	Martini	DROP	30 in.		
TYPE OF DRILL RIG	6" HSA				

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
						6" Asphalt Concrete over 6" Base				
					SM	ARTIFICIAL FILL, ENGINEERED (afe): SILTY SAND, some gravel, orangish brown, slightly moist, dense				
	330	B				@ 3 ft. - pieces of concrete				
5		R	64		ML	TERRACE DEPOSITS (Qt): SANDY SILT, sand is fine to medium-grained, slightly mottled, orangish brown and tan, slightly moist, hard	8.5	103	37	
	325	R	59		SM	@ 7.5 ft. - SILTY SAND, very fine-grained, orangish brown, slightly moist, dense	8.6	104	39	
10		R	76			@ 10 ft. - slightly mottled, orangish brown, slightly moist, very dense	13.9	100	57	
	320									
15		R	68			@ 15 ft. - less silt, light orangish brown, slightly moist, very dense	4.4	104	20	
	315									
20		S	10,14,17			@ 20 ft. - coarse-grained sand at tip, very moist				HY
						TOTAL DEPTH 21.5 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- [R] RING (DRIVE) SAMPLE
- [S] SPT (SPLIT SPOON) SAMPLE
- [B] BULK SAMPLE
- [T] TUBE SAMPLE

GROUNDWATER
SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE B-5

GEOTECHNICAL BORING LOG

PROJECT NO.	500690	PROJECT NAME	Brea Plaza	BORING DESIG.	HS-07
DATE STARTED	10/23/07	GROUND ELEV.	331	LOGGED BY	CED
DATE FINISHED	10/23/07	GW DEPTH (FT)	21	DRIVE WT.	140 lbs.
DRILLER	Martini	DROP	30 in.		
TYPE OF DRILL RIG	6" HSA				

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
						6.5" Asphalt over 3" Base				
	330	B			SC	TERRACE DEPOSITS (Qt): CLAYEY SAND, fine to medium-grained with layers of coarse-grained, trace fine gravel, orange-brown, moist, dense, white carbonate blotches				El HY
5		R	36				7.3	118	48	CON HY
	325	R	71		SM	@ 7.5 ft. - SILTY SAND, fine-grained, trace clay, orange-brown, slightly moist to moist, dense	12.4	107	60	
10		R	79			@ 10 ft. - fine-grained, grades to a CLAYEY SILT, orange brown with gray mottling, dry to moist, dense to very stiff, considerable white carbonates developed in silts, some hardened nodules	10.6	115	63	
	320				ML					
15		R	75		SM	@ 15 ft. - SILTY SAND, fine-grained, light orange brown to orange brown, moist, dense	7.2	108	36	
	315									
20		S	14,17,18			▼				
	310				SP	@ 21 ft. - GRAVELLY SAND, fine to coarse-grained, trace clay, medium brown, moist				
25		S	5,7,10		CL	@ 25 ft. - SANDY CLAY, sand is fine-grained, trace fine gravel, light brown, moist to very moist, stiff to very stiff				
	305									
30		S	9,7,10		ML	@ 30 ft. - CLAYEY SILT, light brown, moist to very moist, stiff				HY
	300					TOTAL DEPTH 31.5 FEET GROUNDWATER ENCOUNTERED AT 20.8 FEET				

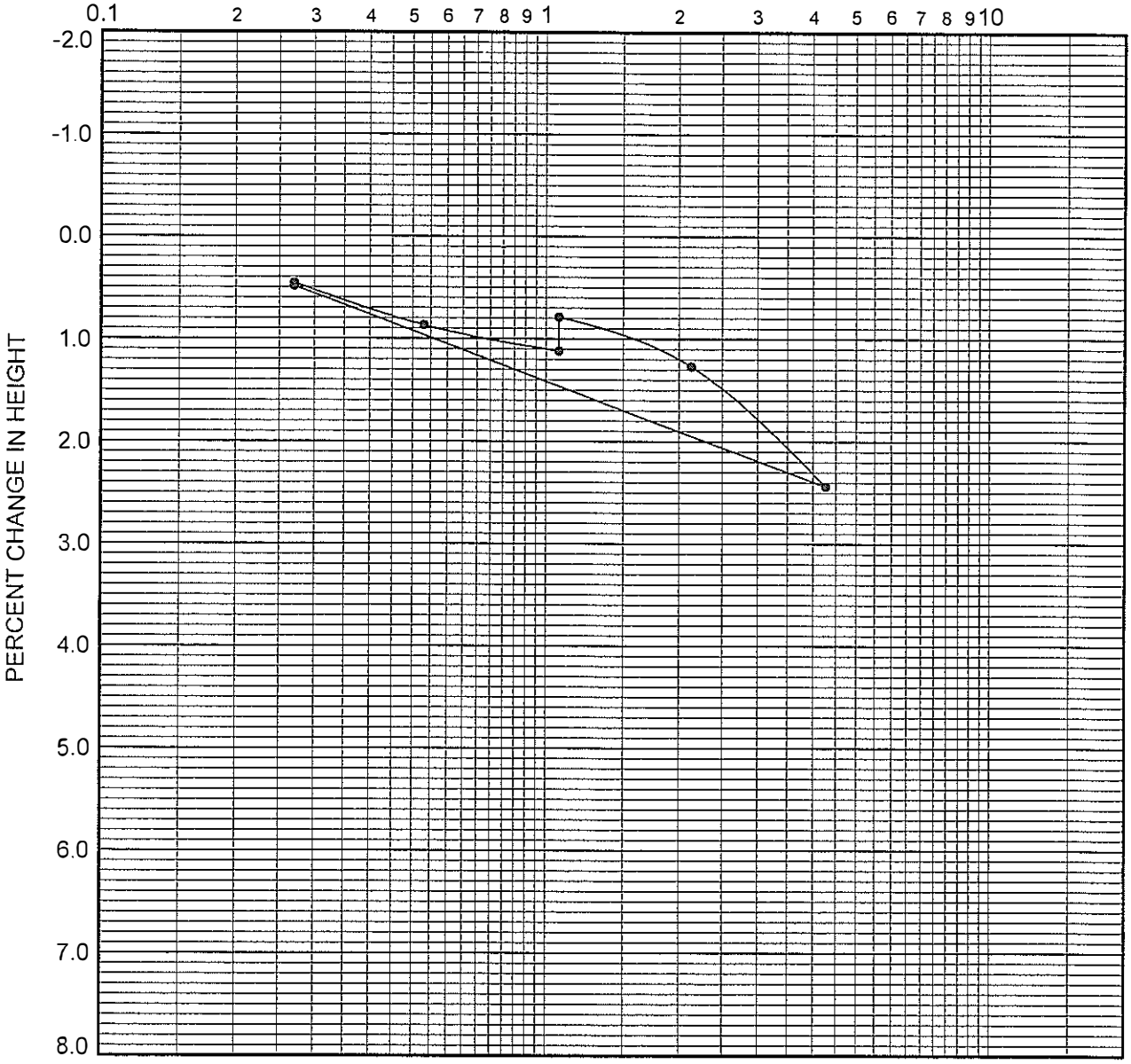
SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE B-7

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-01	15.0	109	18.6	95	70	CL	Artificial Fill, Engineered (afe): Sandy Clay

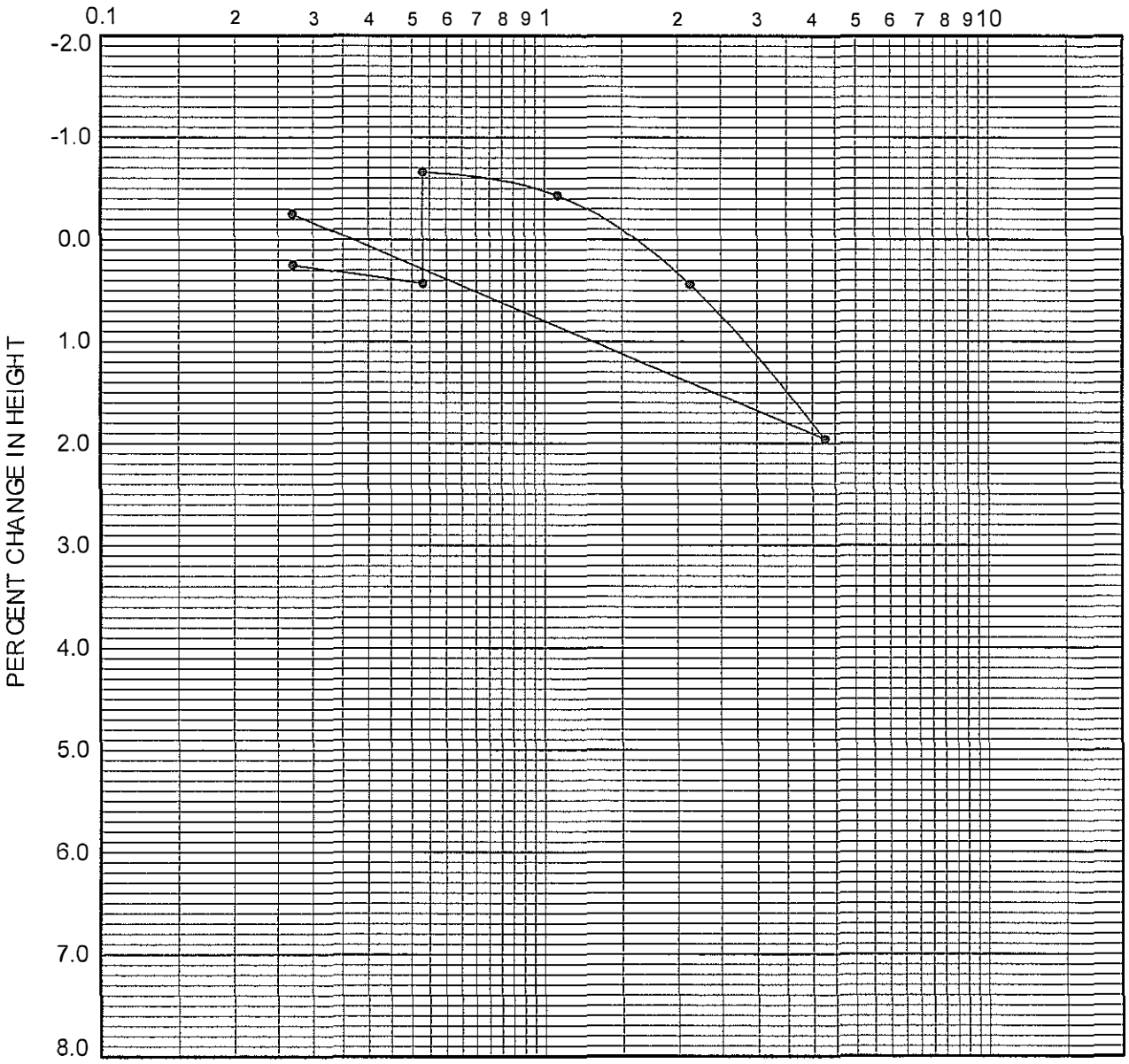
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-1

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-03	10.0	115	15.6	95	69	CL	Terrace Deposits (Qt): Sandy Clay

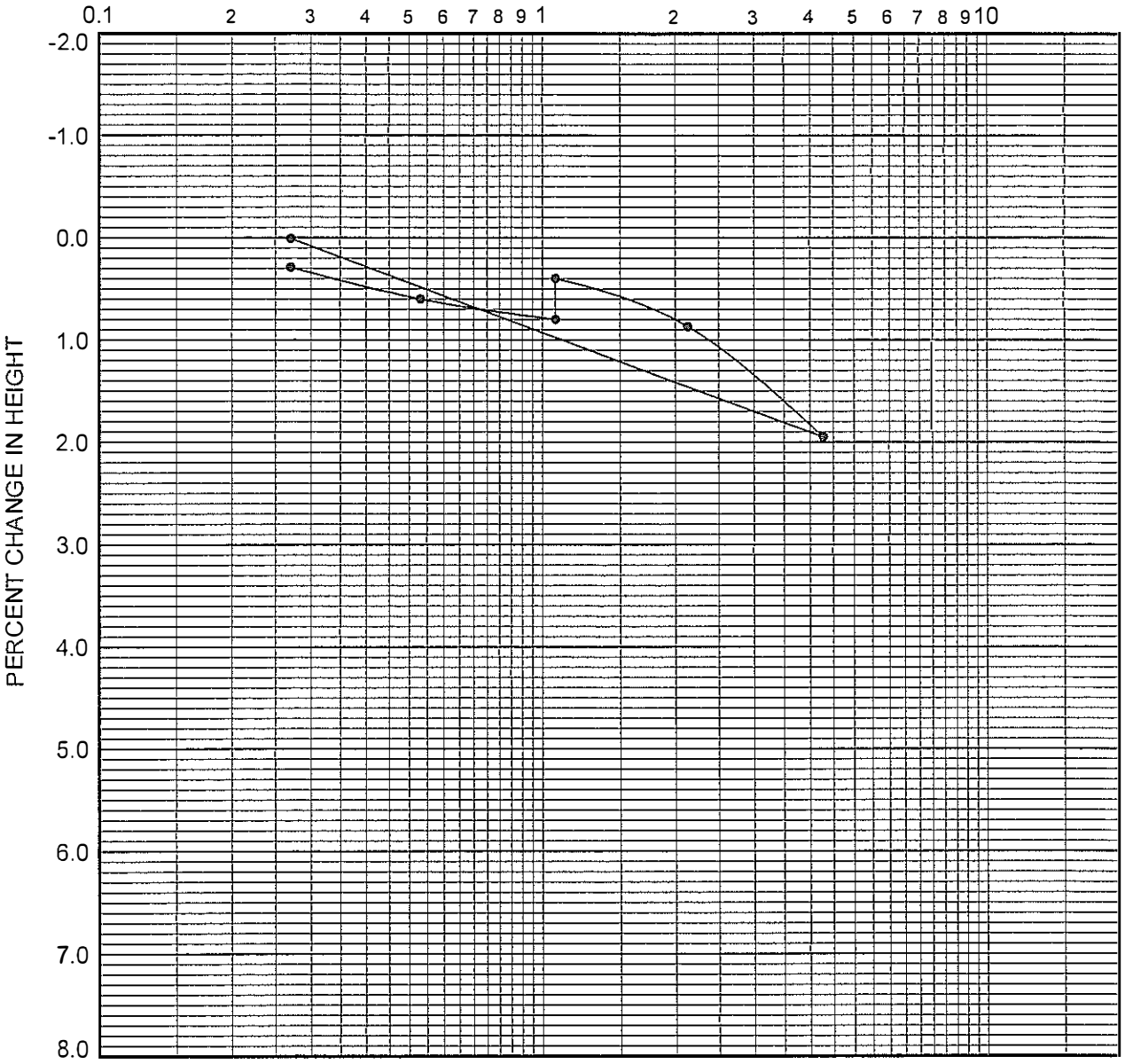
REMARKS: WATER ADDED AT 0.53 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-2

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-06	15.0	111	17.5	93	57	CL	Artificial Fill, Engineered (afe): Sandy Clay

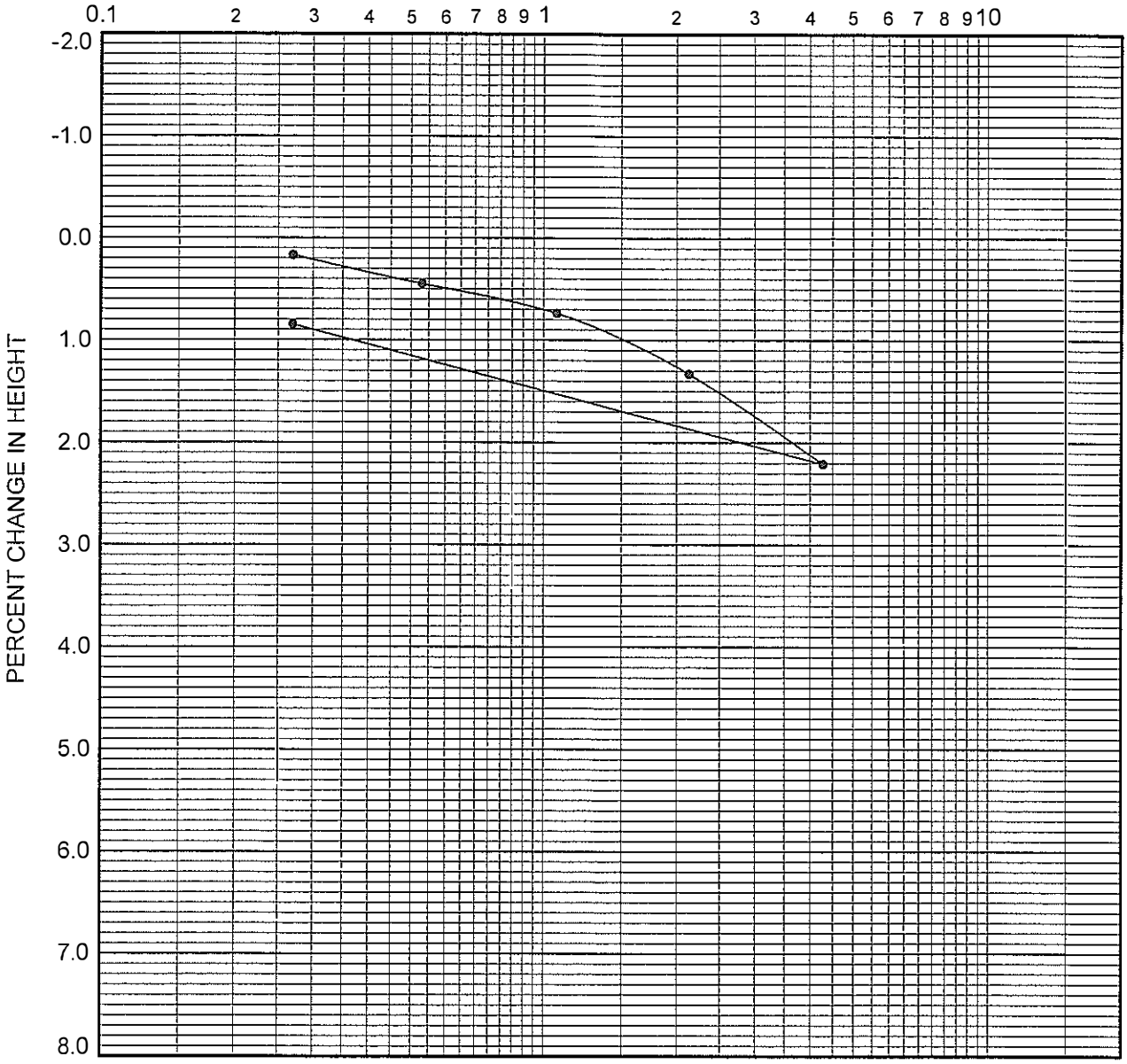
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-3

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-07	5.0	118	7.3	48	25	SC	Terrace Deposits (Qt): Clayey Sand

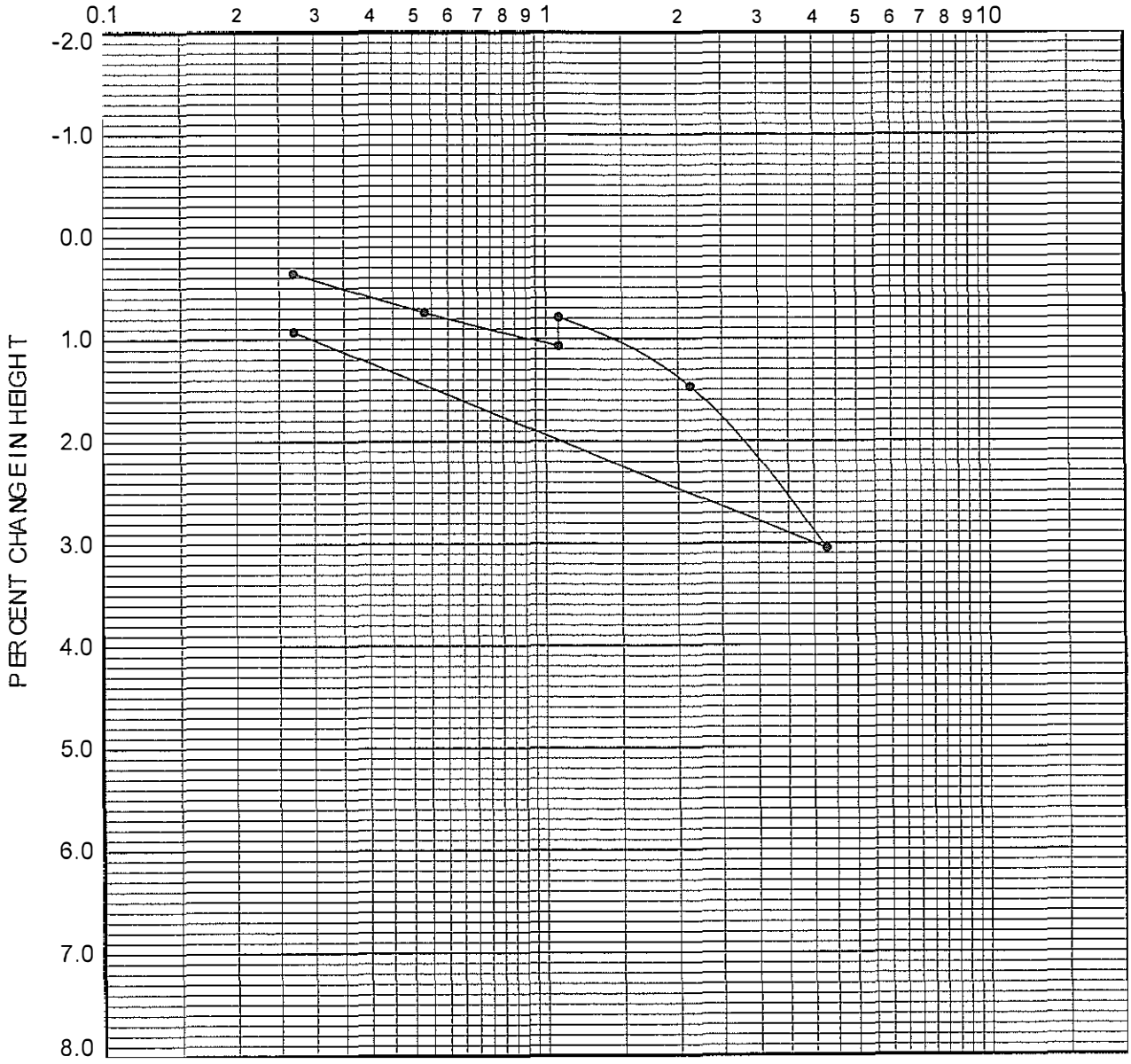
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-4

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-08	10.0	116	14.3	89	45	SC	Terrace Deposits (Qt): Clayey Sand

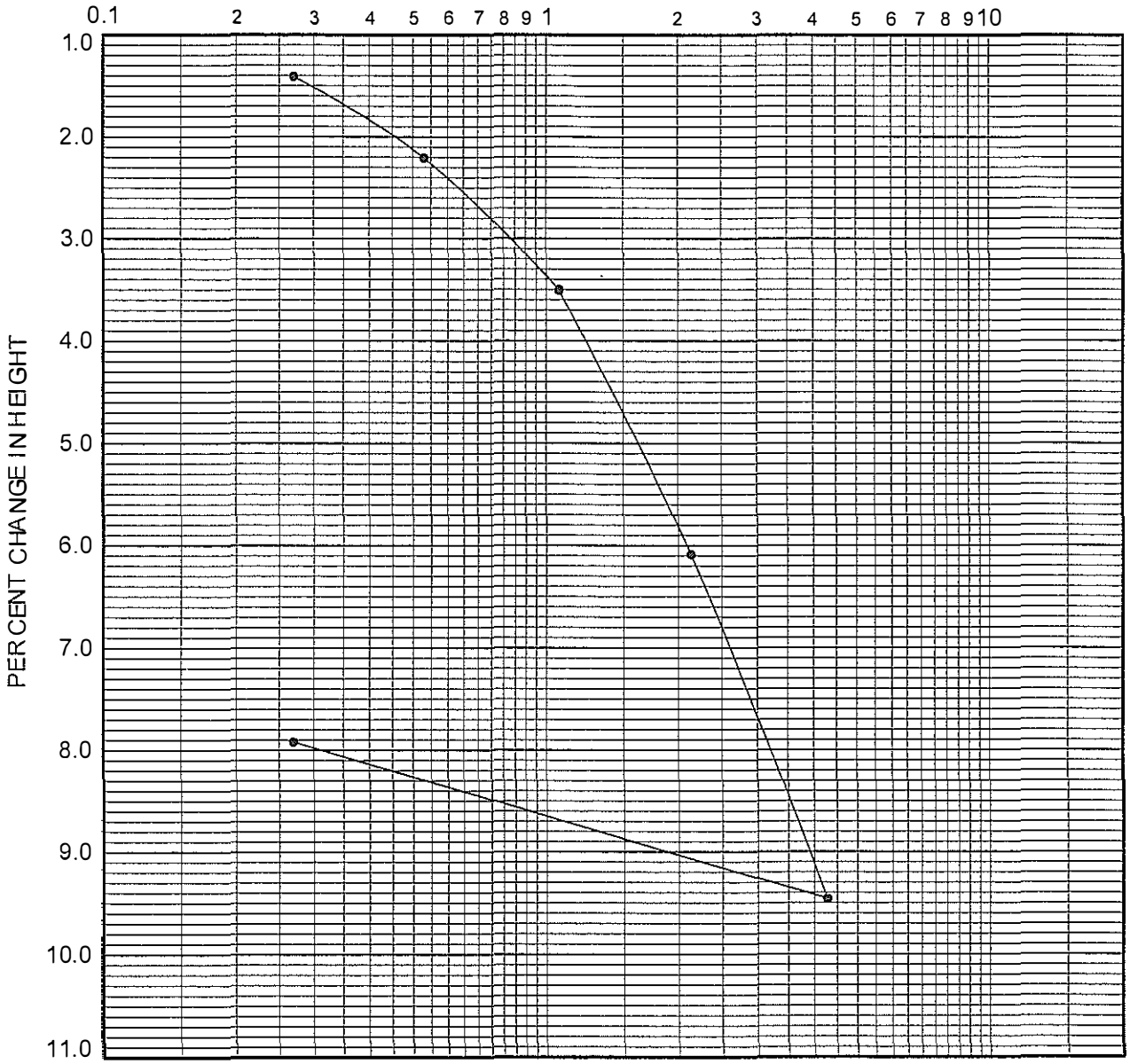
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-5

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-09	10.0	94	24.1	85	77	ML	Alluvium (Qal): Clayey Silt

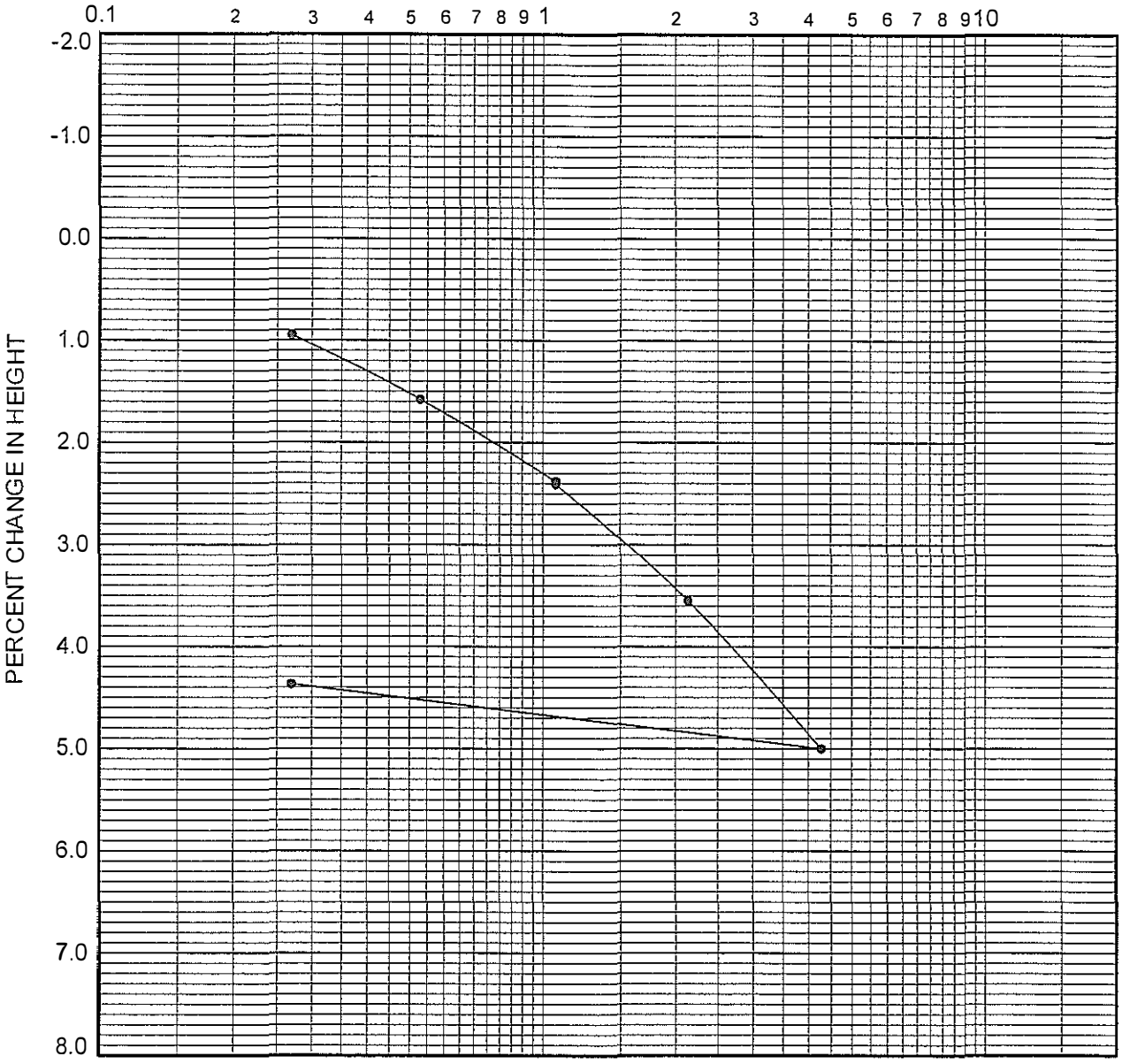
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-6

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-09	15.0	110	17.9	94	30	SC	Alluvium (Qal): Clayey Sand

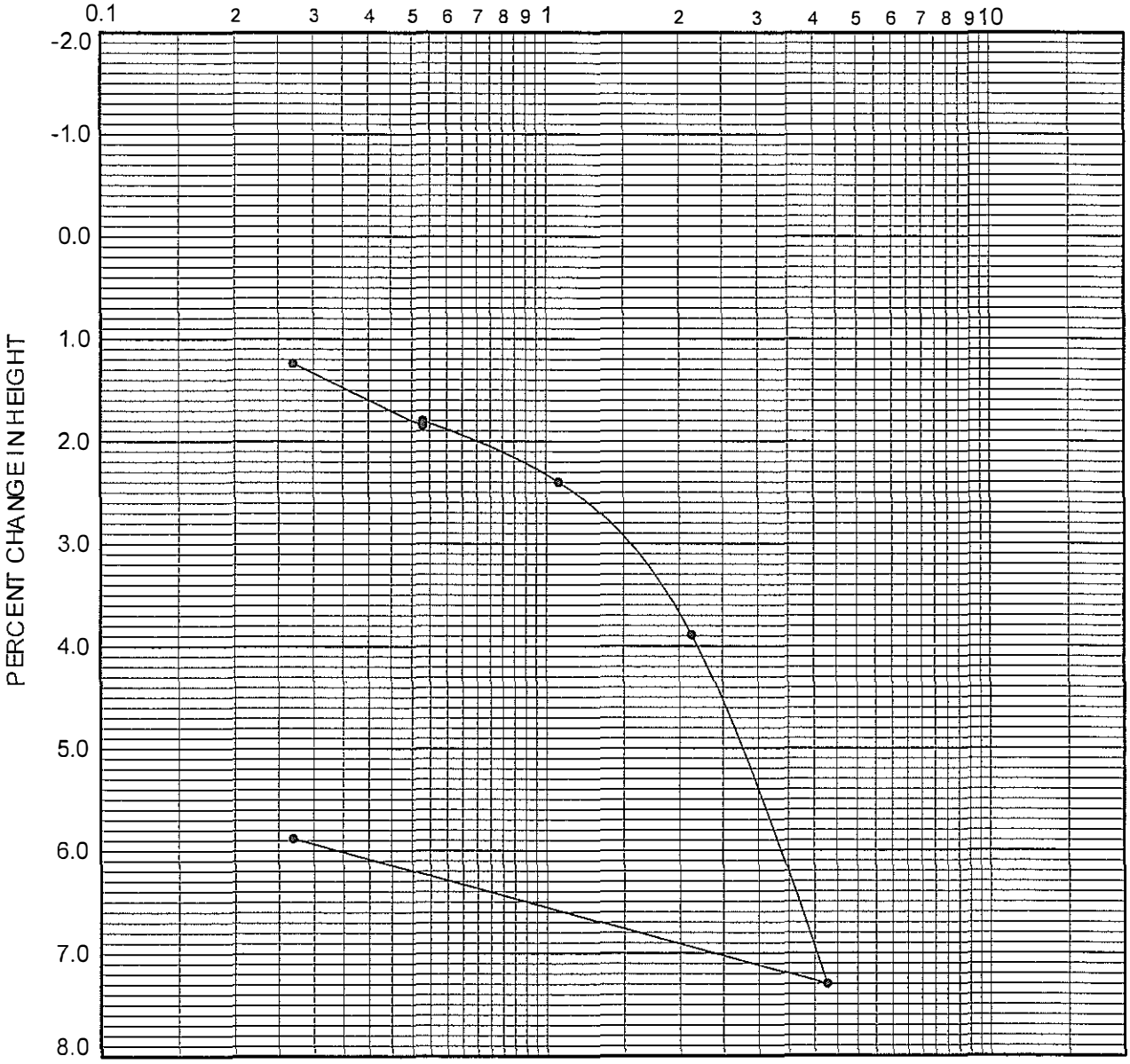
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-7

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-10	7.5	102	21.1	91	73	CL	Alluvium (Qal): Clay

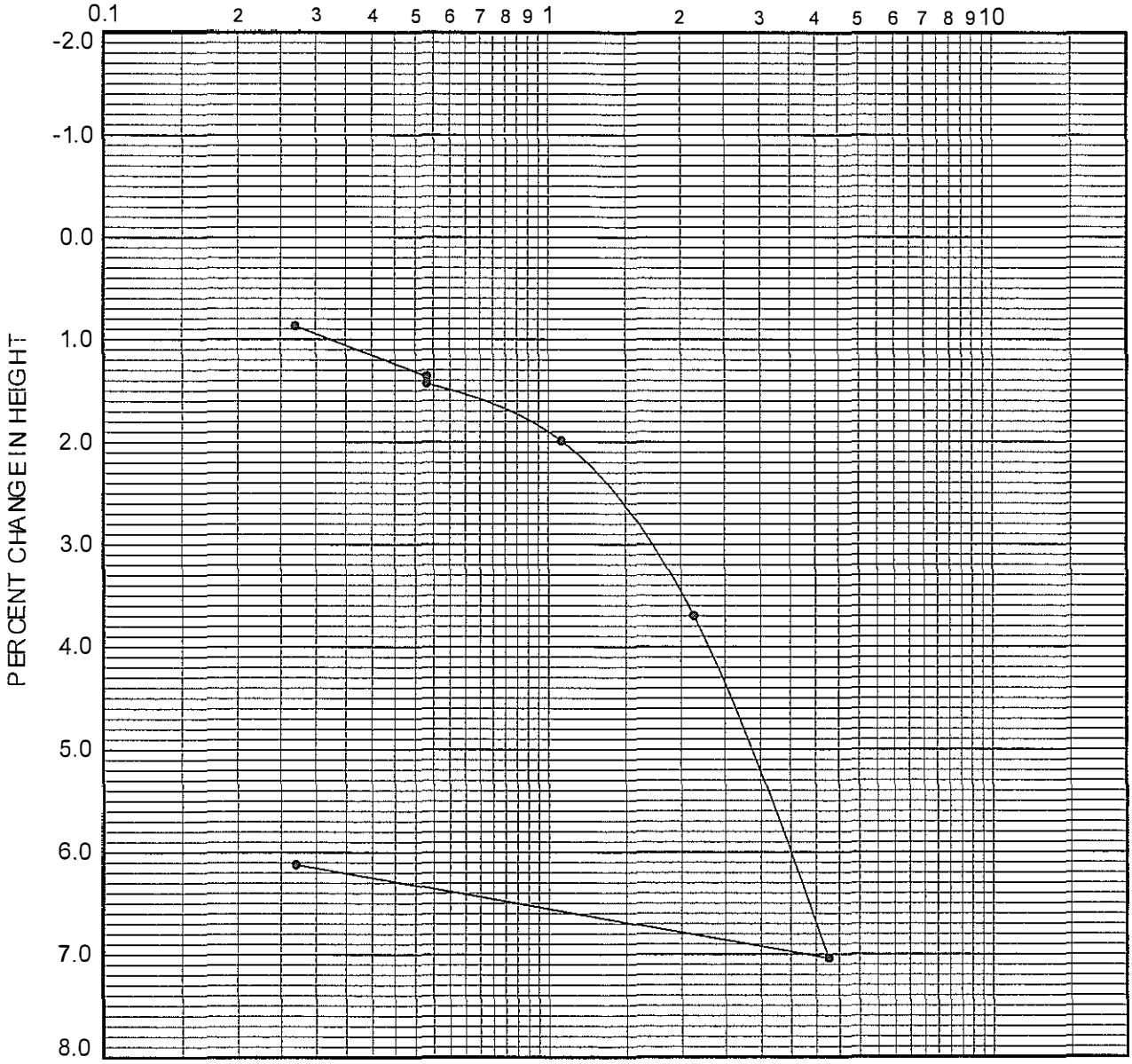
REMARKS: WATER ADDED AT 0.53 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-8

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-11	10.0		15.3		50	CL-ML	Alluvium (Qal): Clayey Silt

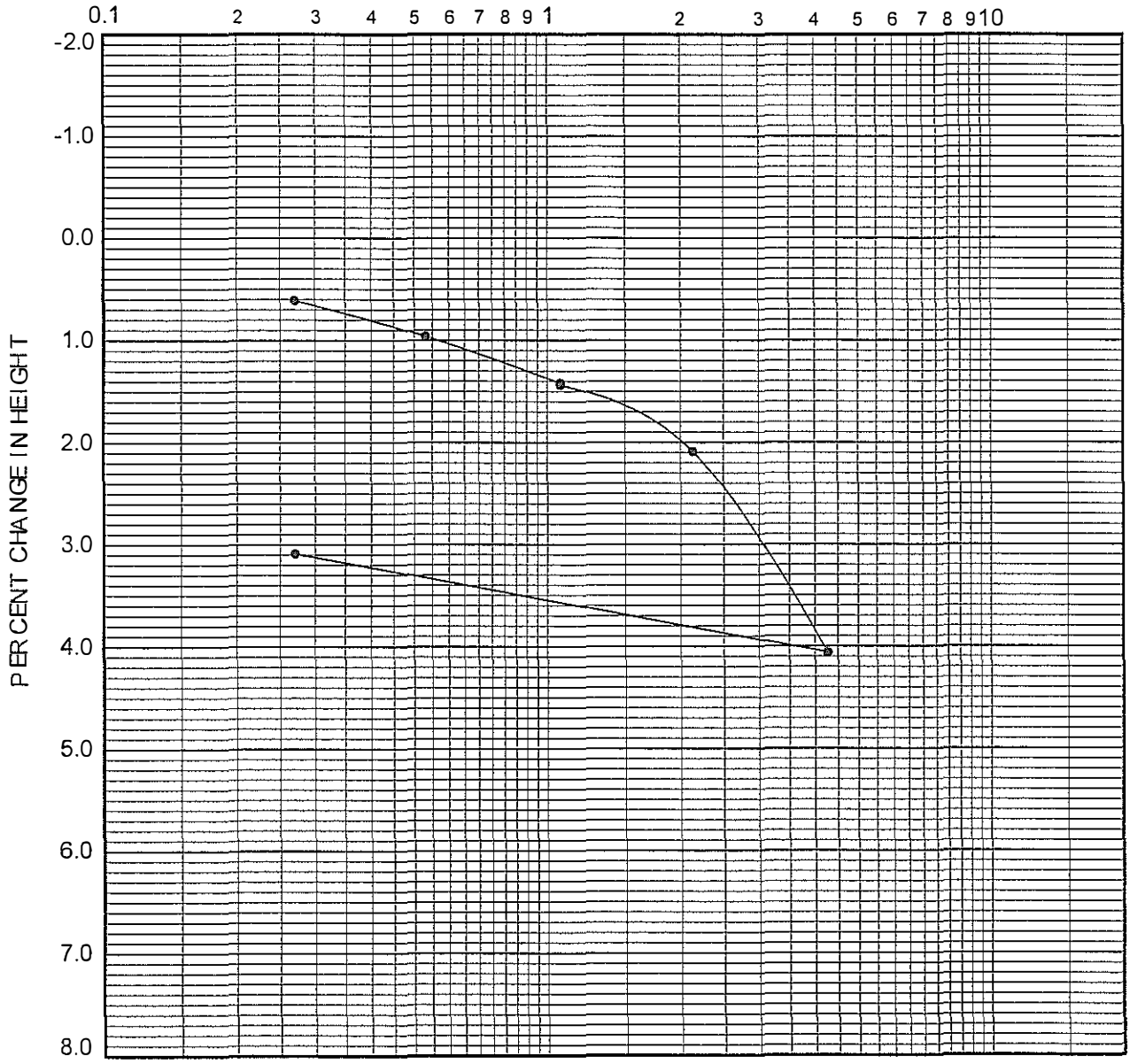
REMARKS: WATER ADDED AT 0.53 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-9

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-12	15.0	110	18.4	96	63	CL-ML	Alluvium (Qal): Silty Clay

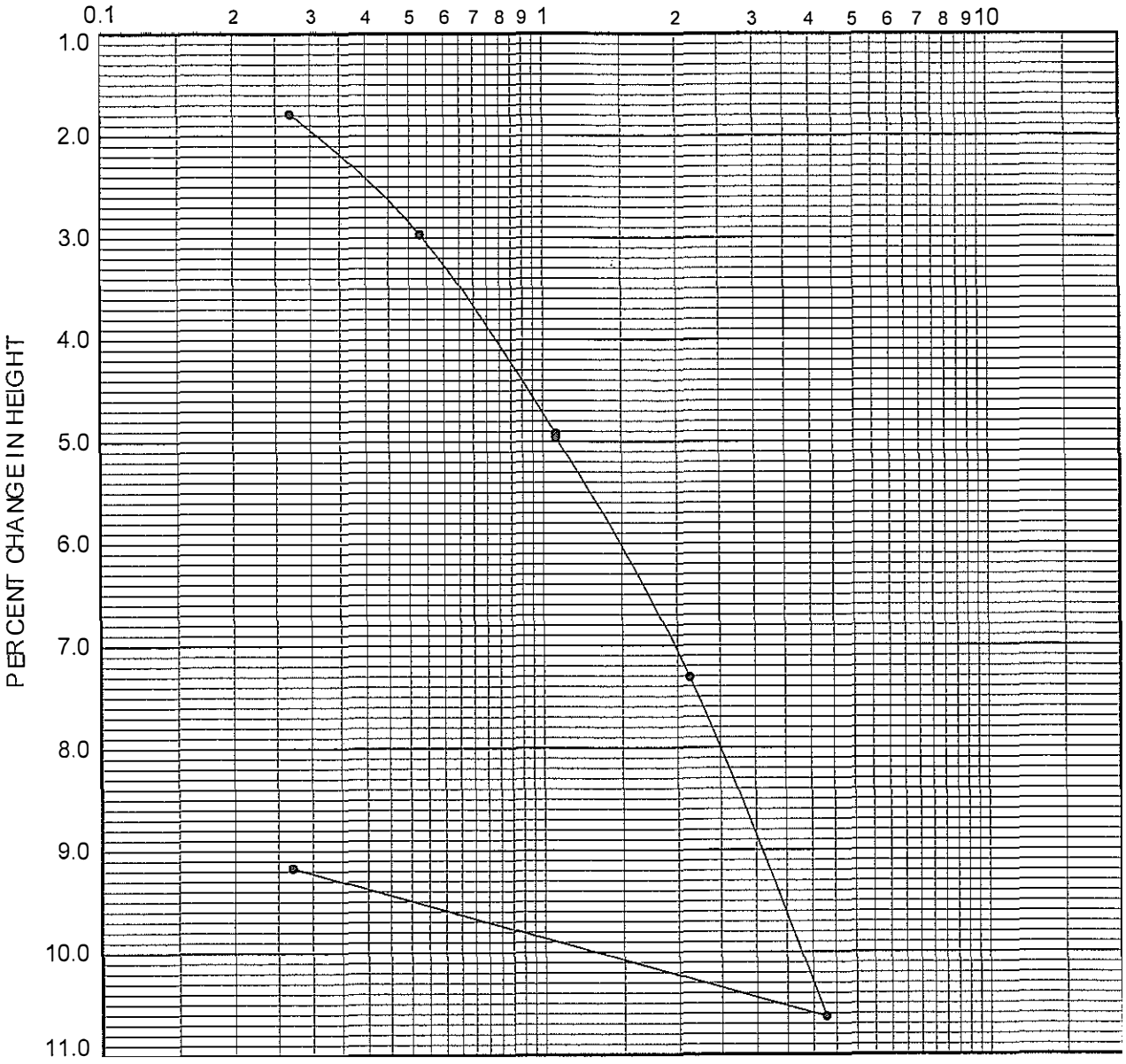
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-10

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-13	7.5	98	26.1	101	72	CL-ML	Alluvium (Qal): Silty Clay

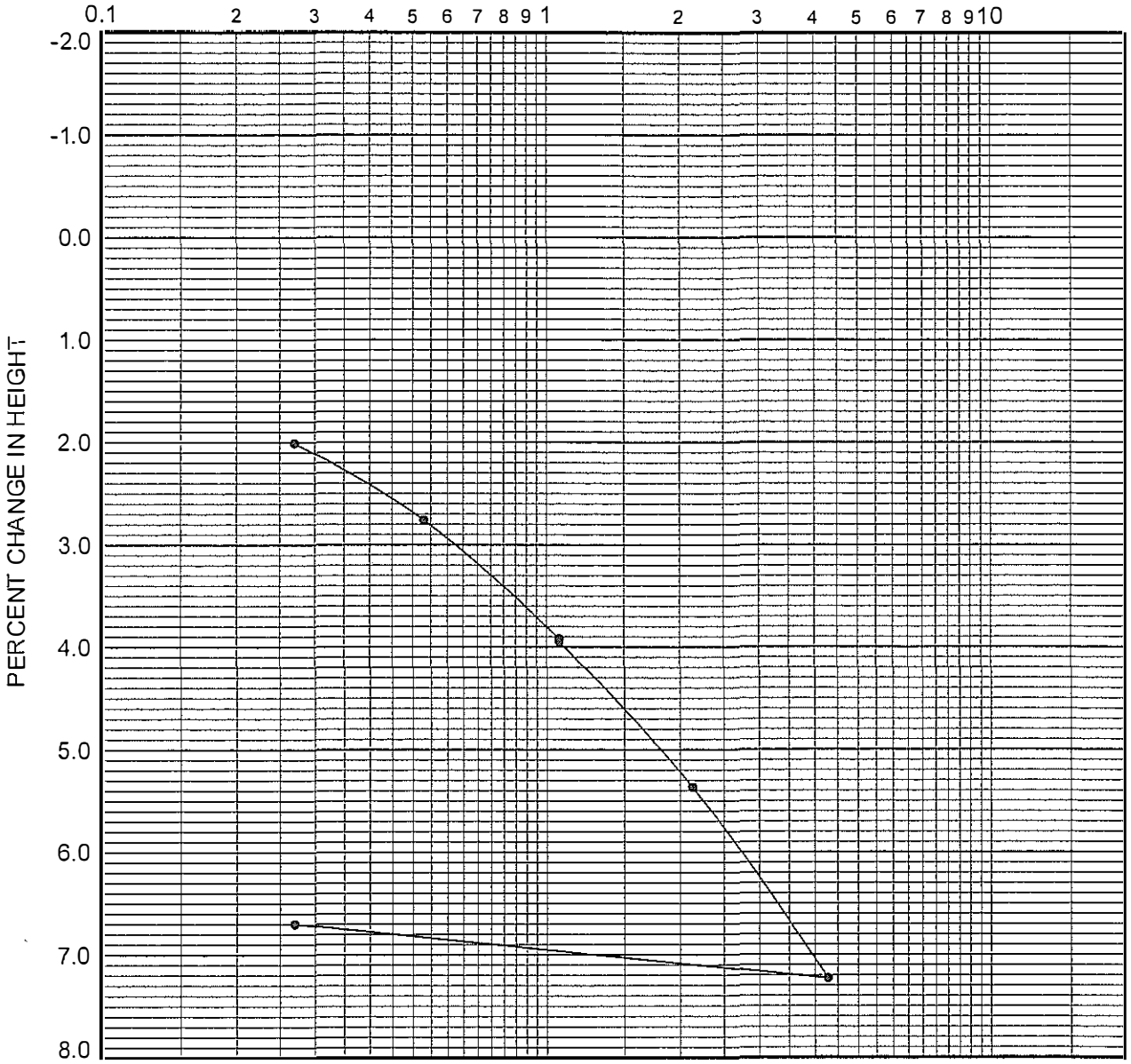
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-11

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-13	15.0	110	18.1	96	34	SM	Alluvium (Qal): Silty Sand

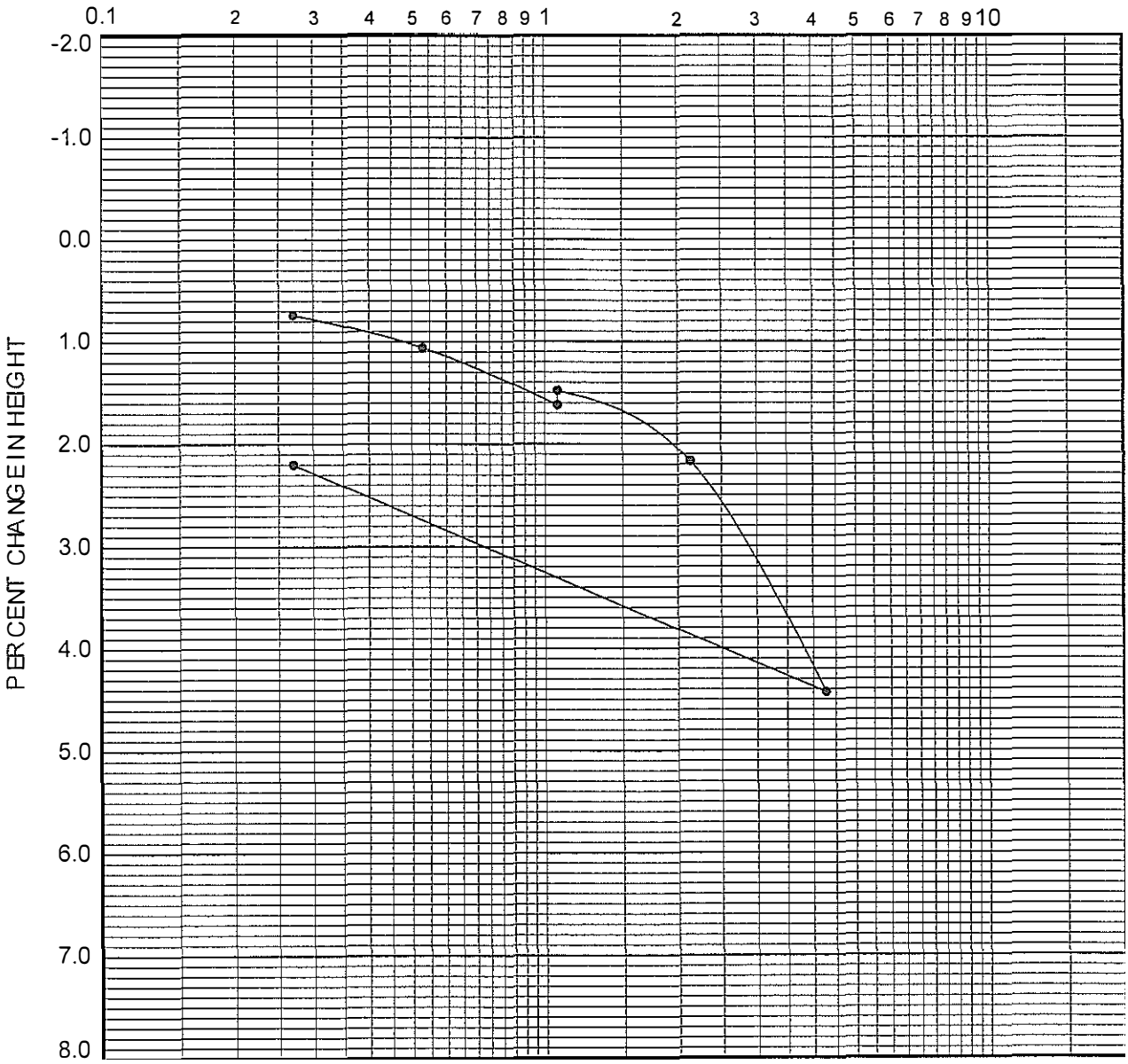
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-12

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
HS-13	20.0	96	28.0	103	83	ML	Terrace Deposits (Qt): Clayey Silt

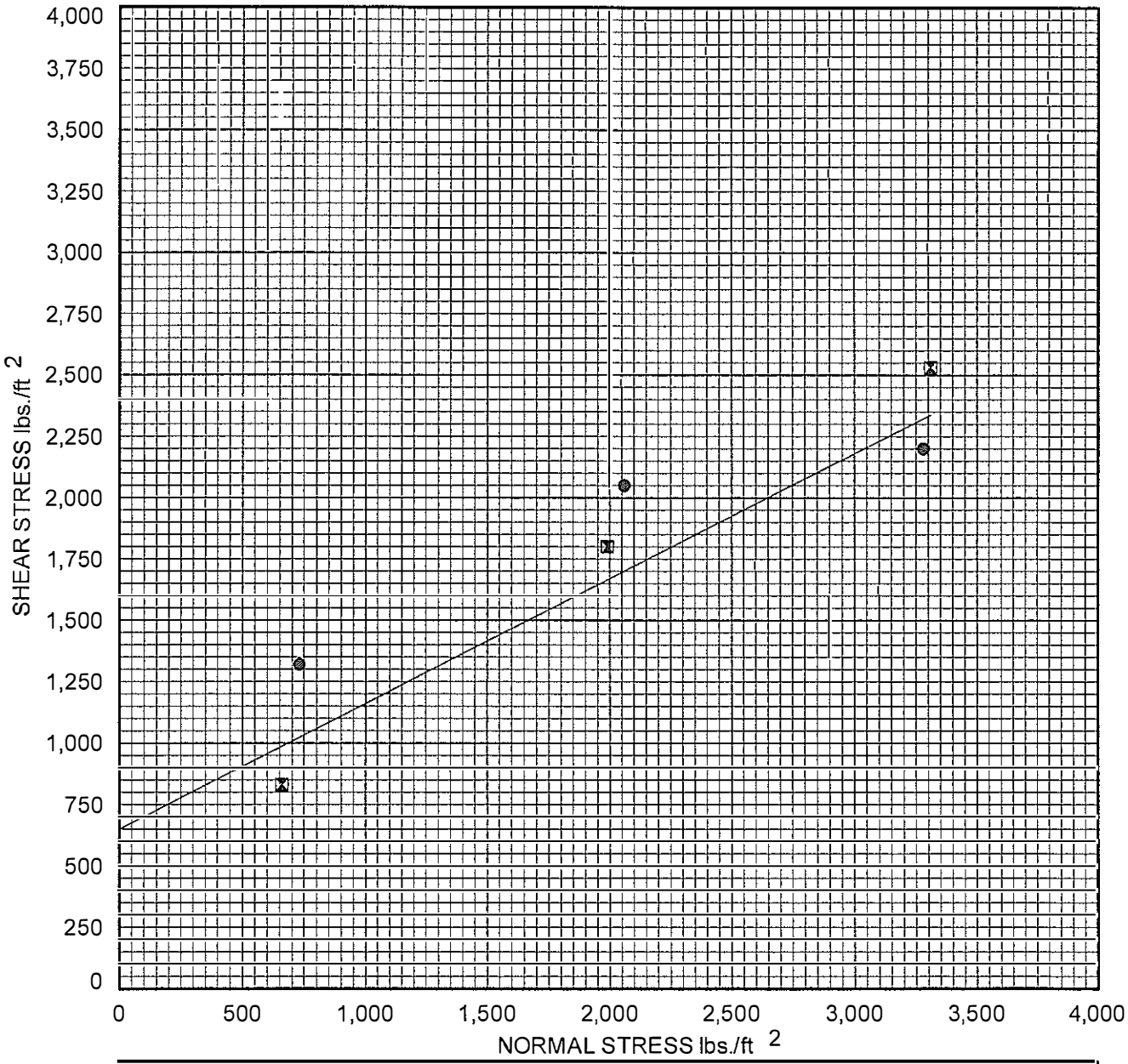
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-13

DIRECT SHEAR TEST
Undisturbed



TYPICAL NAME: Engineered Fill- Sandy Clay	COHESION 650 psf.
GROUP SYMBOL: CL	FRICTION ANGLE 27 degrees

symbol	boring	depth	symbol	boring	depth	symbol	boring	depth	symbol	boring	depth
●	HS-06	7.5	⊗			◆			✳		
⊠	HS-08	5.0	⊕			◇			◘		
▲			□			×			◙		
★			⊖			✠			▤		
✕			◒			◙			▥		
✿			☆								
○			⊡								
△			■								

PACIFIC SOILS ENGINEERING, INC.

W.O. 500690 PLATE C-14

SUMMARY — BORING NO. 3

DATE DRILLED: June 20, 1975

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 326.7'

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
0			dry	firm	black	CLAY cracked				
	1	CL/CH	moist	stiff		adobe		1.6		
				very stiff						
					dark gray brown	SILTY CLAY				
5	2					sandy		11		
					gray brown					
						SANDY CLAY				
	3	CL						11		
10					brown & gray streaks					
	4							9		
				very dense	brown	CLAYEY SAND				
15	5	SC						14		
						No ground water encountered				
20										
25										

BREA PLAZA
Imperial Highway and Associated Road, Brea, California
for Brea Associates

DRAWING NO. 4

CONVERSE, DAVIS AND ASSOCIATES *Consulting Engineers and Geologists* PROJ. NO. A-75-587-A

SUMMARY — BORING NO. 4

DATE DRILLED: June 19, 1975

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 337.5

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
0			dry	firm	black	CLAY jointed,				
			moist	stiff	gray & black brown	adobe cracked				
		CL/CH								
	1						4	14.7	103	3.24
					brown					
	2	CL & ML		& very stiff		SILTY CLAY	6	16.5	102	1.46
5						+ alt. merg. stks. sandy silt				
				very stiff & medium hard streaks		SANDY SILT with some clay + freq. fine 1" calcarious streaks, slightly cemented				
	3	ML					17	11.9	113	4.39
10										
	4	& SM		& very dense	& light brown	+ alt. stks. silty sand	14	11.4	111	2.67
		SM		very dense	light brown	SILTY SAND				
	5	& SP			& light gray	+ merging streaks sand, fine	16	10.4	106	2.51
15		& ML		& hard stks.		+ occ. fine 3" stks. silt w/ cem. calc. stks.				
		SP/SM		very dense	light brown	SAND, fine				
	6						16	6.9	99	2.14
20						No ground water encountered				
25										

BREA PLAZA
Imperial Highway and Associated Road, Brea, California
for Brea Associates

DRAWING NO 5

CONVERSE, DAVIS AND ASSOCIATES *Consulting Engineers and Geologists* PROJ. NO. A-75-587-A

SUMMARY — BORING NO. 5

DATE DRILLED: June 19, 1975

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 335.7'

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
0			dry	stiff	black gray	SILTY CLAY				
	1	CL	slightly moist	very stiff	black brown			6		.46* .50* 1.35*
			moist		brown	sandy				
5	2	& SM		& very dense		+ alt. merg. stks. silty sand		9		
		SM & SP/SM		very dense	& light brown	+ alt. merg. stks. SILTY SAND & SAND, fine				
10	3	SP/SM			light brown	SAND, fine & stks. fine to med. + occ. pea gravel to ½"		13		
		& SM			& brown	+ alt. stks. silty sand				
15	4	SM ML				alt. merg. stks. SILTY SAND SANDY, SILT & SILT w/ trace clay		14		
						No ground water encountered				
20										
25										

* Sample saturated and drained before shearing at ½, 1, and 2 ksf.

BREA PLAZA
Imperial Highway and Associated Road, Brea, California
for Brea Associates

DRAWING NO. 6

CONVERSE, DAVIS AND ASSOCIATES — *Consulting Engineers and Geologists* — PROJ. NO. A-75-587-A

SUMMARY — BORING NO. 6

DATE DRILLED: June 19, 1975

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 329.0'

DEPTH IN FEET	SAMPLES	SYMBOL						DRIVE ENERGY FT.-KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
0			dry	firm	black	CLAY	porous				
		CL	moist	stiff	gray	adobe					
		CL			dark brown						
	1	CH			brown				8		
		CL		very stiff		SILTY CLAY,					
		SM & SP SW		very dense		SILTY SAND,	& gravelly + occ. cobbles to 6"		9		
5	2				& light gray brown		+ alt. stks. sand, fine + sand, fine to coarse w/ occ. pea gr. to 1"				
	3								13		
		ML & SM		very stiff & dense	light brown	SILT					
10	4						+ alt. stks. sandy silt & silty sand		8		
							+ stks. sand, fine to coarse				
		ML & SM & CL		very stiff & very dense	gray brown & light brown & red brown	SILT with trace clay + alt. very fine 1" stks. sandy silt & silty sand	+ occ. fine stks. calc. silt & freq. cemented fine 3" concretions		14		
15	5										
						+ alt. stks. clayey silt & silty clay					
20	6								11		
		ML ML/CL CL & SP/SM SM		very stiff & very dense	& light gray & light brown	+ stks. sand, fine to silty sand					
25	7								18		

(continued)

BREA PLAZA
Imperial Highway and Associated Road, Brea, California
for Brea Associates

DRAWING NO. 7

CONVERSE, DAVIS AND ASSOCIATES — *Consulting Engineers and Geologists* — PROJ. NO. A-75-587-A

APPENDIX F

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.'S

RESULTS OF INFILTRATION TESTING, PROPOSED BREA PLAZA MIXED USE DEVELOPMENT, NWC IMPERIAL HIGHWAY AT ASSOCIATED ROAD, BREA, CALIFORNIA, DATED JULY 30, 2020

July 30, 2020

BOSC Realty Advisors
888 W. Big Beaver Road, Suite 200
Troy, Michigan 48084

Attention: Mr. Waad J. Nadhir

Project No.: 20G168-2

Subject: Results of Infiltration Testing
Proposed Brea Plaza Mixed Use Development
NWC Imperial Highway at Associated Road
Brea, California

Reference: Geotechnical Feasibility Study, Proposed Brea Plaza Mixed Use Development, NWC Imperial Highway at Associated Road, Brea, California, prepared by Southern California Geotechnical, SCG Project No. 20G168-1, dated July 30, 2020.

Mr. Nadhir:

In accordance with your request, we have conducted infiltration testing at the subject site. We are pleased to present this report summarizing the results of the infiltration testing and our design recommendations.

Scope of Services

The scope of services performed for this project was in general accordance with Proposal No. 20P269, dated June 29, 2020. The scope of services included visual site reconnaissance, subsurface exploration, field and laboratory testing, and engineering analysis to determine the infiltration rates of the onsite soils. The infiltration testing was performed in general accordance with the guidelines published by Orange County: Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (WQMPs), Appendix VII. These guidelines are dated December 20, 2013.

Site and Project Description

Brea Plaza Center is located at the northwest corner of Imperial Highway and Associated Road, in Brea, California. The overall site is bounded to the north by existing single-family residences, to the west by the 57 freeway, to the south by Imperial Highway, and to the east by Associated Road. The general location of the site is illustrated on the Site Location Map, enclosed as Plate 1 in Appendix A of this report.

Brea Plaza is a retail shopping center, approximately 15 acres in size. The specific subject site is a roughly L-shaped area, 2.7± acres in size, located in the western region of Brea Plaza, adjacent to the 57 Freeway. The subject site is presently developed with a Buca de Beppo restaurant, a Custom Comfort Mattress store, a movie theater, and a multi-tenant retail building. The remainder of the subject site is covered by asphaltic concrete (AC) pavements

that are used for automobile and truck parking and drive lanes. Limited areas of the subject site are paved with Portland cement concrete (PCC) pavements. Concrete flatwork and landscaped planters are located throughout the existing development. The remaining areas of the Brea Plaza Center are developed with similar retail and restaurant buildings and AC pavements.

Topographic information for the site was obtained from a site plan provided by Architects Orange. The site topography slopes from the northwest corner towards the southeast. The elevation at the subject site generally ranges from 336± feet mean sea level (msl) in the northern region of the subject site to 329± feet msl in the southern region.

Proposed Development

A preliminary site plan was provided to our office by the client. The site will be developed with several new structures including a hotel, residential apartments, a restaurant, a self-storage building and an office building. The hotel will be located in the southwestern region of the site, will have a footprint of 15,000 to 20,000± ft² and will be 6 stories in height. The restaurant will be incorporated into the first story of the hotel. The apartment building will be located in the northern region of the site, and will have a footprint of 45,000± ft². This building will be a total of 7 stories in height, with the lower two levels consisting of a parking structure. The self-storage facility will be incorporated into the residential building. Two areas of new offices will be constructed over portions of the existing multi-tenant retail building and the Custom Comfort Mattress store. The office building will be 3 stories in height, with a footprint of 8,000± ft². The existing movie theater and Buco de Beppo restaurant will be demolished as part of the redevelopment. The buildings will be surrounded by asphaltic concrete or Portland cement concrete pavements for automobile parking and drive lanes. The proposed development is also expected to include some areas of concrete flatwork and landscape planters.

Previous Studies

Southern California Geotechnical, Inc. (SCG) was provided with a copy of a previous study conducted for the overall site by Pacific Soils Engineering (PSE). This document was prepared for storm drain improvements that have since been constructed in the eastern region of the Brea Plaza site. The report also included a summary of data collected during previous investigations at the site. A summary of the relevant information pertaining to the subject site from this document is presented below:

> Preliminary Geotechnical Investigation, Proposed Storm Drain Improvements for the Loftus Diversion Channel and the Brea Plaza Shopping Center, Northwest Corner of Imperial Highway and Associated Road, City of Brea, California, Prepared by Pacific Soils Engineering, Inc., dated March 26, 2008, Work Order 500690.

The overall subsurface exploration for this project consisted of thirteen (13) borings and ten (10) cone penetration tests. Boring Nos. HS-03, HS-04, HS-05, and HS-07, as well as CPT Nos. CPT-1, CPT-3, and CPT-4 were within the area of the specific subject site and will be the focus of this summary. The borings were advanced to depths of up to 21½ to 31½± feet below the existing site grades. Engineered fill soils were reportedly encountered beneath the pavements at several of the boring locations. It should be noted that PSE did not provide any documentation to confirm that the existing fill soils were monitored and tested during

placement. The fill soils extended to depths of up to 2 to 10± feet below grade at these boring locations, and generally consisted of medium dense to dense medium dense to dense clayey sand, silty sand and sandy clay. Beneath the fill materials, all of the borings encountered terrace deposits, extending to at least the maximum depth explored of 31± feet. The terrace deposits generally consisted of stiff to hard sandy clay, dense to very dense sandy silt, silty sand, and clayey sand. Occasional layers of gravelly sand and clayey silt were encountered. The results of expansion index testing performed for this report identified low to highly expansive soils at the boring locations. Ground water was encountered at most borings at depths between 10 and 30± feet. The report also notes that layers of perched groundwater were encountered during the investigation.

In Appendix D of this report, a previous report within the subject site was reviewed and summarized:

> Geotechnical Investigation, Proposed Shopping Center, Imperial Highway at Orange Freeway, Brea, California, Prepared by Converse Davis Dixon Associates, dated July 21, 1975, Project No. A-75-587-A.

The exploration for this report consisted of 12 borings advanced to depths of 3 to 30± feet below the site grades. The borings were advanced with a truck-mounted, rotary drilling machine equipped with a 16 to 20-inch diameter drilling bucket. Boring Nos. CD BH-3 through CD BH-5 are located within the subject site. Native alluvial soils were encountered at the ground surface of these 3 borings. The near surface alluvium within the upper 6½± feet generally consisted of stiff to very stiff clay and silty clay. Deeper alluvial soils, extending to at least 20± feet below ground surface, generally consisted of medium dense to very dense silty sand, sandy silt and silt. Occasional layers of very stiff/very dense sandy clay and clayey sand were encountered. Swell tests were conducted on Boring Nos. CD BH-3 and CD BH-5, results showed a 9.7 and 7.7 percent swell, respectively. No groundwater was encountered during the drilling of the relevant borings.

Concurrent Study

Southern California Geotechnical, Inc. (SCG) concurrently conducted a geotechnical investigation at the subject site. As part of this study, four (4) borings were advanced to depths of 25 to 50± feet below existing site grades. Asphaltic concrete pavements were encountered at the ground surface of all boring locations and generally consist of 3 to 8± inches of Asphaltic concrete underlain by 5 to 7± inches of crushed aggregate base. Artificial fill soils were encountered beneath the pavements at Boring Nos. B-2 through B-4, extending to depths of 5½ to 6½± feet below the existing site grades. The artificial fill soils generally consist of medium dense to very dense silty fine sand with trace clay nodules and clayey fine sand, as well as stiff to hard silty clay and fine sandy clay. The fill soils possess a disturbed and mottled appearance with occasional artificial debris content (including fragments of wood, brick and asphaltic concrete) resulting in their classification as artificial fill. Additional soils classified as possible fill were encountered beneath the pavement of Boring No. B-1 and beneath the fill of Boring No. B-4, extending to depths of 5½ to 8½± feet below ground surface. These soils possess similar characteristics to the fill soils, but lack any obvious indicators of fill such as brick or asphaltic concrete fragments. Native terrace deposits were encountered beneath the fill and/or possible fill soils at all of the boring locations, extending to at least the maximum depth

explored of 50± feet below ground surface. The near surface terrace deposits within the upper 5½ to 22± feet generally consist of medium dense to very dense fine sand, silty fine sand and occasionally fine sandy silt. Terrace deposits extending deeper than 22± feet generally consist of very stiff to hard silty clay and fine sandy clay, as well as medium dense fine sand. Occasional layers of medium dense to dense clayey silt and silty fine sand were encountered. Trace to some calcareous nodules were observed in some of the terrace deposits. Boring No. B-1 encountered a fine to coarse sand layer at depths of 17 to 25± feet.

Free water was encountered during the drilling of all boring locations, at depths of 22½ to 23½± feet. A delayed groundwater level reading was taken at Boring No. B-2, 3± hours after the completion of the boring. At this boring location, water was present at a depth of 22½± feet below ground surface during the final measurement. Based on the moisture contents of the recovered soil samples and the delayed water measurements taken within the open boreholes, the static groundwater table is considered to have been present at depths of 22½± feet below the existing site grades at the time of the subsurface investigation.

Subsurface Exploration

Scope of Exploration

The subsurface exploration conducted for the infiltration testing consisted of two (2) infiltration test borings, advanced to depths of 10± feet below the existing site grades. The infiltration borings were advanced using a truck-mounted drill rig, equipped with 8-inch diameter hollow stem augers. The borings were logged during drilling by a member of our staff. The approximate locations of the infiltration test borings (identified as I-1 and I-2) are indicated on the Boring and Infiltration Test Location Plan, enclosed as Plate 2 of this report.

Upon the completion of the infiltration borings, the bottom of each test boring was covered with 2± inches of clean ¾-inch gravel. A sufficient length of 3-inch-diameter perforated PVC casing was then placed into each test hole so that the PVC casing extended from the bottom of the test hole to the ground surface. Clean ¾-inch gravel was then installed in the annulus surrounding the PVC casing.

Geotechnical Conditions

Asphaltic concrete (AC) pavements were encountered at the ground surface at both borings, consisting of 3 to 4± inches of AC underlain by 4 to 6± inches of aggregate base. Artificial fill soils were encountered beneath the AC pavements at both boring locations, extending to depths of 8 to 10± feet below existing site grades. The artificial fill soils consist of medium dense/stiff clayey fine sand, silty fine sand, and silty clay. These soils possess a disturbed and mottled appearance, resulting in their classification as artificial fill. At Infiltration Test No. I-2, terrace deposits were encountered at depths of 8 to 10± feet below existing site grades. The terrace deposits consist of hard fine sandy clay with little silt, trace amounts of medium to coarse sand, and little calcareous veining/nodules. The Boring Logs, which give detailed illustrations of the conditions encountered at the boring locations are included with this report.

Free water was encountered during the drilling of the boring locations performed during the concurrent study (Boring Nos. B-1 through B-4), at a depth of 23½± feet. A delayed

groundwater level reading was taken at Boring No. B-2, 3± hours after the completion of the boring. At this boring location, water was present at a depth of 22½± feet below ground surface during the final measurement. Based on the moisture contents of the recovered soil samples and the delayed water measurements taken within the open boreholes, the static groundwater table is considered to have been present at a depth of 22½± feet below the existing site grades at the time of the subsurface investigation.

As part of our research, we reviewed readily available groundwater data in order to determine regional groundwater depths. Recent water level data was obtained from the California State Water Resources Control Board, GeoTracker, website, http://geotracker.waterboards.ca.gov/. The nearest monitoring well on record is located approximately 475 feet southeast of the site. Water level readings within this monitoring well indicate a high groundwater level of 18± feet below the ground surface, in December 2011.

To confirm soil conditions beneath the infiltration test depths (10± feet), SCG reviewed the nearby boring logs (HS-3 and CD BH-3) from the previous studies conducted at the subject site. At Boring No. HS-3, the soils from depths of 10 to 20± feet consisted of stiff sandy clay terrace deposits. Groundwater was encountered at a depth of 26± feet below ground surface at the time of drilling. At Boring No. CD BH-3 the soils from depths of 10 to 16± feet (maximum depth explored) consisted of very stiff sandy clay and very dense clayey sand. No groundwater was encountered during drilling.

Infiltration Testing

As previously mentioned, the infiltration testing was performed in general accordance with the Orange County guidelines: Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (WOMPs), Appendix VII.

Pre-soaking

In accordance with the county infiltration standards, both of the infiltration test borings were pre-soaked prior to the infiltration testing. The pre-soaking process consisted of filling the test borings by inverting a full 5-gallon bottle of clear water supported over each hole so that the water level reaches a level of at least 5 times the hole's radius above the gravel at the bottom of each hole. The pre-soaking was completed after all of the water had percolated through each test hole or after 15 hours since initiating the pre-soak.

Infiltration Testing

Following the pre-soaking process of the infiltration test borings, SCG performed the infiltration testing. Each test hole was filled with water to a depth of at least 5 times the hole's radius above the gravel at the bottom of each test hole, and less than or equal to the water level used during the pre-soaking process. In accordance with the Orange County guidelines, since "other soils" were encountered at the bottom of both of the infiltration borings, readings were taken at 30-minute intervals for a total of 6 hours. After each reading, the borings were refilled to the correct water level above the gravel at the bottom of each test hole. The water level readings

are presented on the spreadsheets enclosed with this report. The infiltration rates for each of the timed intervals are also tabulated on the spreadsheets.

The infiltration rates from the test are tabulated in inches per hour. In accordance with the typically accepted practice, it is recommended that the most conservative reading from the latter part of the infiltration tests be used as the design infiltration rate. The rates are summarized below:

Infiltration Test No.	Depth (feet)	Soil Description	Infiltration Rate (inches/hour)
I-1	10	Brown Silty Clay, little fine Sand, trace medium Sand	0.03
I-2	10	Brown fine Sandy Clay, little Silt, trace medium to coarse Sand	0.36

Laboratory Testing

Moisture Content

The moisture contents for the recovered soil samples were determined in accordance with ASTM D-2216 and are expressed as a percentage of the dry weight. These test results are presented on the Boring Logs.

Grain Size Analysis

The grain size distribution of selected soils collected from the bottom of each infiltration test boring have been determined using a range of wire mesh screens. These tests were performed in general accordance with ASTM D-422 and/or ASTM D-1140. The weight of the portion of the sample retained on each screen is recorded and the percentage finer or coarser of the total weight is calculated. The results of these tests are presented on Plates C-1 and C-2 of this report.

Design Recommendations

Two (2) infiltration tests were performed at the subject site. The infiltration rates at these locations range from 0.03 to 0.36 inches per hour. The major factors affecting the lack of infiltration at these borings is the presence of medium stiff to hard clayey soils at the test depths. Although an infiltration rate of 0.36 inches per hour was calculated for Infiltration Test No. I-2, negligible infiltration was measured at Infiltration Test Nos. I-1. Therefore, infiltration is not considered feasible for this site, due to the test results and the type of soils encountered at the boring locations.

General Comments

This report has been prepared as an instrument of service for use by the client in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the

contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, structural engineer, and/or civil engineer. The design of the infiltration system is the responsibility of the civil engineer. The role of the geotechnical engineer is limited to determination of infiltration rate only. By using the design infiltration rates contained herein, the civil engineer agrees to indemnify, defend, and hold harmless the geotechnical engineer for all aspects of the design and performance of the infiltration system. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur. The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between trench locations and testing depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.

This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted. The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

Closure

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

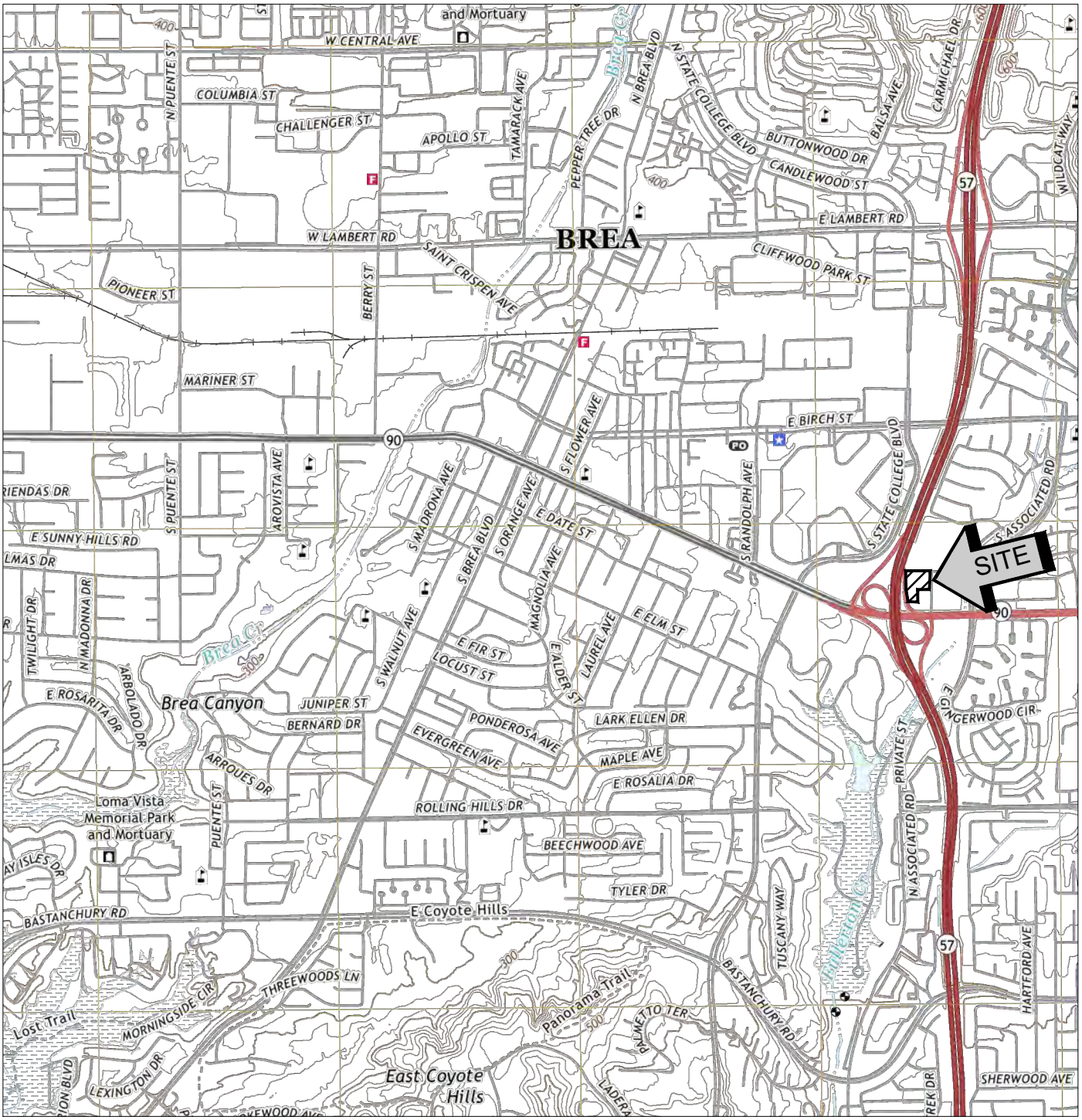
SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

Jamie Hayward
Staff Geologist

Gregory K. Mitchell, GE 2364
Principal Engineer

Distribution: (1) Addressee

Enclosures: Plate 1 - Site Location Map
Plate 2 – Boring and Infiltration Test Location Plan
Boring Log Legend and Logs (4 pages)
Infiltration Test Results Spreadsheets (2 pages)
Grain Size Distribution Graphs (2 pages)



SOURCE: USGS TOPOGRAPHIC MAP OF THE LA HABRA QUADRANGLE, ORANGE COUNTY, CALIFORNIA, 2018

SITE LOCATION MAP

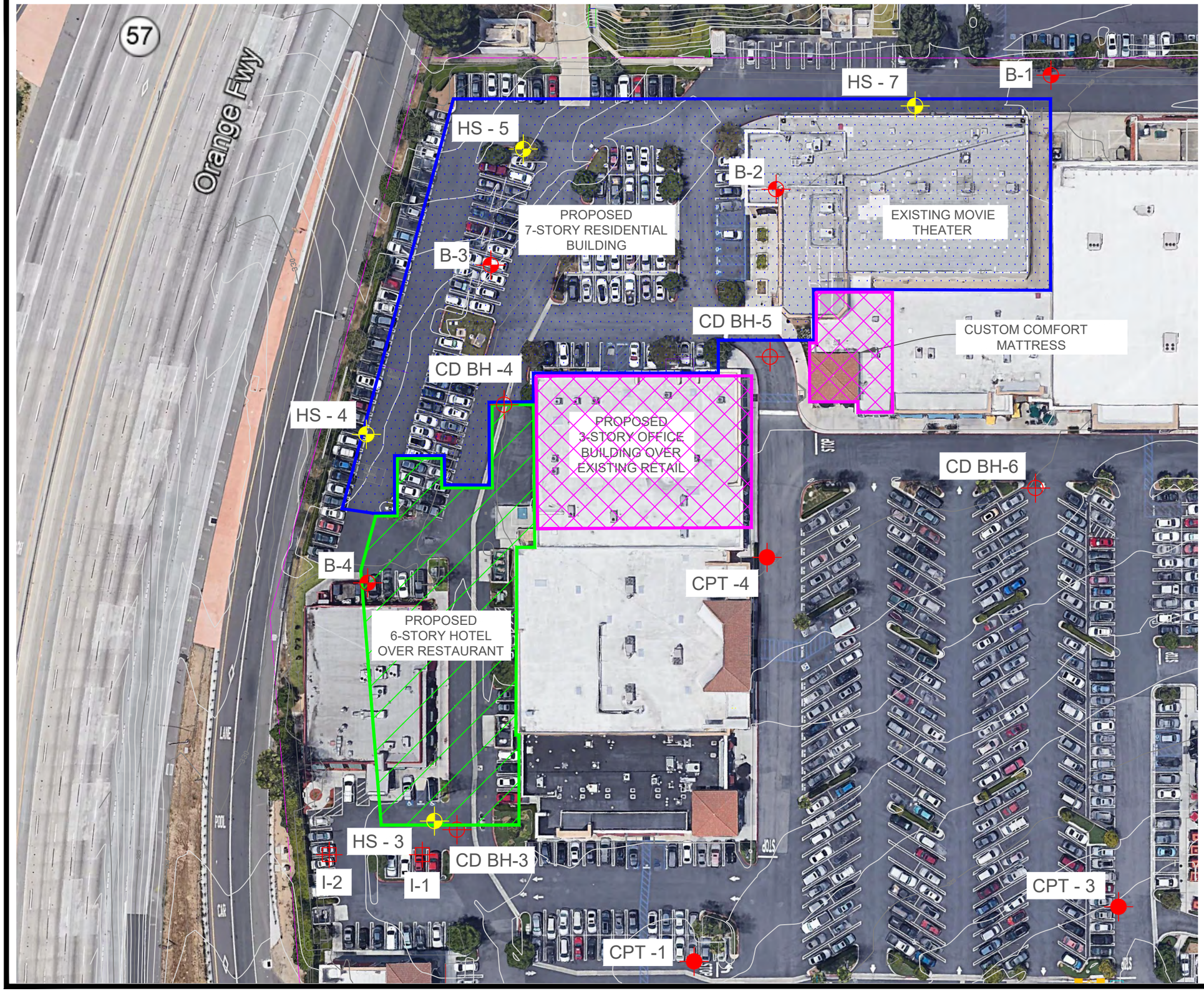
PROPOSED BREA PLAZA MIXED USE

BREA, CALIFORNIA

SCALE: 1" = 2000'	
DRAWN: JAH CHKD: DN	
SCG PROJECT 20G168-2	
PLATE 1	

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



NORTH
SoCalGeo

GEOTECHNICAL LEGEND

- **APPROXIMATE BORING LOCATION**
- **APPROXIMATE 6-INCH DIAMETER BORING LOCATION (PACIFIC SOILS ENGINEERING)**
- **APPROXIMATE CPT LOCATION (PACIFIC SOILS ENGINEERING)**
- **APPROXIMATE 16 TO 24-INCH DIAMETER BORING LOCATION (CONVERSE, DAVIS, DIXON ASSOCIATES, 1975)**
- **PROPOSED 3-STORY OFFICE BUILDING OVER EXISTING RETAIL**
- **PROPOSED 6-STORY HOTEL OVER RESTAURANT**
- **PROPOSED 7-STORY RESIDENTIAL BUILDING**
- **APPROXIMATE INFILTRATION TEST LOCATION**

NOTE: CONCEPTUAL SITE PLAN PROVIDED BY ARCHITECTS ORANGE.

BORING AND INFILTRATION TEST LOCATION PLAN

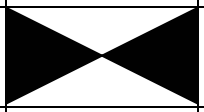
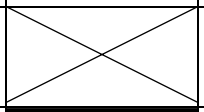
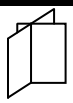
PROPOSED BREA PLAZA MIXED USE

BREA, CALIFORNIA

SCALE: 1" = 60'	
DRAWN: JAH CHKD: GKM	
SCG PROJECT 20G168-2	
PLATE 2	

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL

BORING LOG LEGEND

SAMPLE TYPE	GRAPHICAL SYMBOL	SAMPLE DESCRIPTION
AUGER		SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED)
CORE		ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK.
GRAB		SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED)
CS		CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED)
NSR		NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL.
SPT		STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED)
SH		SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED)
VANE		VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED.

COLUMN DESCRIPTIONS

DEPTH: Distance in feet below the ground surface.

SAMPLE: Sample Type as depicted above.

BLOW COUNT: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

POCKET PEN.: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

GRAPHIC LOG: Graphic Soil Symbol as depicted on the following page.

DRY DENSITY: Dry density of an undisturbed or relatively undisturbed sample in lbs/ft^3.

MOISTURE CONTENT: Moisture content of a soil sample, expressed as a percentage of the dry weight.

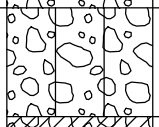
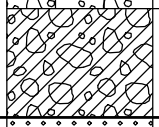
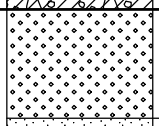
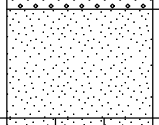
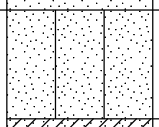
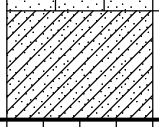
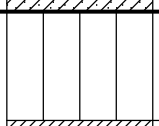
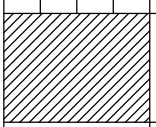
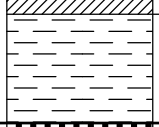
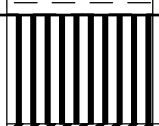
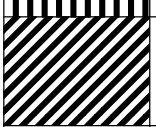
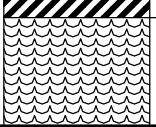
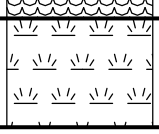
LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

PLASTIC LIMIT: The moisture content above which a soil behaves as a plastic.

PASSING #200 SIEVE: The percentage of the sample finer than the #200 standard sieve.

UNCONFINED SHEAR: The shear strength of a cohesive soil sample, as measured in the unconfined state.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-1

JOB NO.: 20G168-2
PROJECT: Proposed Brea Plaza Mixed Use
LOCATION: Brea, California

DRILLING DATE: 7/9/20
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: ---

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 328.5 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					3± inches Asphaltic Concrete, 4± inches Aggregate Base							
					FILL: Brown Clayey fine Sand, trace fine root fibers, medium dense-moist to very moist		17					
					FILL: Brown Silty fine Sand, little Clay, trace Calcareous nodules, medium dense-very moist		21					
5					FILL: Brown Silty Clay, little fine Sand, trace medium Sand, trace Calcareous nodules, medium stiff-moist to very moist		26					
		4			@ 8½ feet, organic staining, soft		18					
10					Boring Terminated at 10 feet							

TBL 20G168-2.GPJ SOCALGEO.GDT 7/30/20

TEST BORING LOG

PLATE B-1

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-2

JOB NO.: 20G168-2
PROJECT: Proposed Brea Plaza Mixed Use
LOCATION: Brea, California

DRILLING DATE: 7/9/20
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: ---

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 329.5 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					4± inches Asphaltic Concrete, 6± inches Aggregate Base							
					FILL: Brown Clayey fine Sand, slightly mottled, medium stiff-very moist		24					
					FILL: Brown Silty Clay, little fine Sand, trace fine root fibers, stiff-moist to very moist		20					
5					@ 6 feet, trace Calcareous nodules		21					
		68/4"			TERRACE DEPOSITS: Brown fine Sandy Clay, little Silt, trace medium to coarse Sand, little Calcareous veining/nodules, hard-damp to moist		10					
10					Boring Terminated at 10 feet							

TBL 20G168-2.GPJ SOCALGEO.GDT 7/30/20

TEST BORING LOG **PLATE B-2**

INFILTRATION CALCULATIONS

Project Name	Proposed Brea Plaza Mixed Use
Project Location	Brea, CA
Project Number	20G168-2
Engineer	Jamie Hayward

Test Hole Radius	8	(in)
Test Depth	10.3	(ft)

Infiltration Test Hole: I-1

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
P1	Initial	8:00 AM	30.0	8.15	-0.02	2.16	-0.06
	Final	8:30 AM		8.13			
P2	Initial	8:31 AM	30.0	8.13	0.02	2.16	0.06
	Final	9:01 AM		8.15			
1	Initial	9:01 AM	30.0	8.15	-0.01	2.16	-0.03
	Final	9:31 AM		8.14			
2	Initial	9:32 AM	30.0	8.14	0.00	2.16	0.00
	Final	10:02 AM		8.14			
3	Initial	10:02 AM	30.0	8.14	0.01	2.16	0.03
	Final	10:32 AM		8.15			
4	Initial	10:33 AM	30.0	8.15	0.00	2.15	0.00
	Final	11:03 AM		8.15			
5	Initial	11:04 AM	30.0	8.15	0.00	2.15	0.00
	Final	11:34 AM		8.15			
6	Initial	11:35 AM	30.0	8.15	0.01	2.15	0.03
	Final	12:05 PM		8.16			
7	Initial	12:05 PM	30.0	8.15	0.01	2.15	0.03
	Final	12:35 PM		8.16			
8	Initial	12:35 PM	30.0	8.15	0.01	2.15	0.03
	Final	1:05 PM		8.16			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where: Q = Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Brea Plaza Mixed Use
Project Location	Brea, CA
Project Number	20G168-2
Engineer	Jamie Hayward

Test Hole Radius	8	(in)
Test Depth	10.2	(ft)

Infiltration Test Hole	I-2

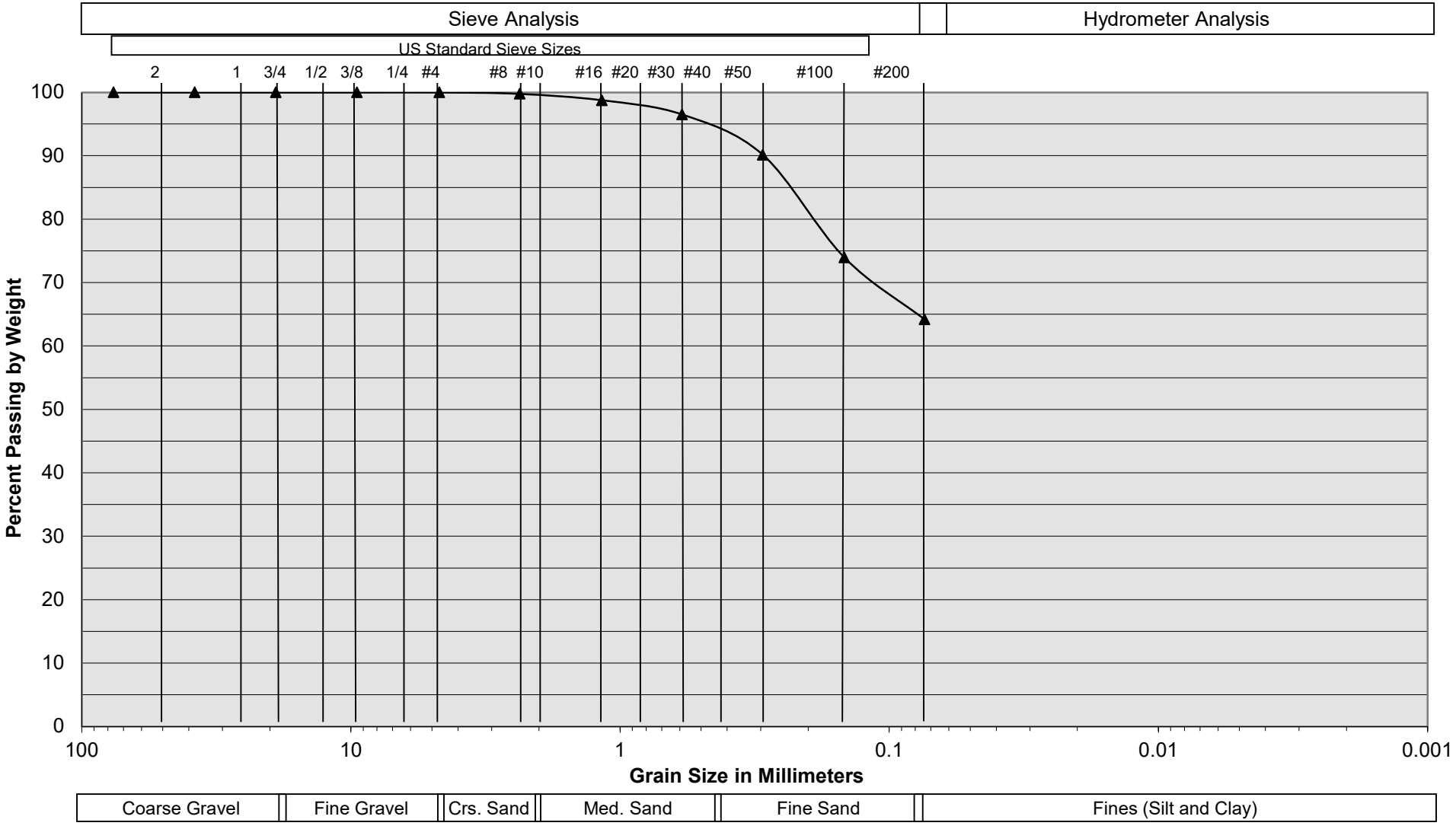
Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
P1	Initial	8:08 AM	30.0	8.00	0.07	2.15	0.23
	Final	8:38 AM		8.07			
P2	Initial	8:39 AM	30.0	7.97	0.13	2.15	0.42
	Final	9:09 AM		8.10			
1	Initial	9:10 AM	30.0	8.00	0.12	2.12	0.39
	Final	9:40 AM		8.12			
2	Initial	9:41 AM	30.0	7.99	0.11	2.14	0.36
	Final	10:11 AM		8.10			
3	Initial	10:12 AM	30.0	7.98	0.11	2.15	0.36
	Final	10:42 AM		8.09			
4	Initial	10:43 AM	30.0	7.90	0.07	2.25	0.22
	Final	11:13 AM		7.97			
5	Initial	11:14 AM	30.0	7.97	0.11	2.16	0.35
	Final	11:44 AM		8.08			
6	Initial	11:45 AM	30.0	8.00	0.11	2.13	0.36
	Final	12:15 PM		8.11			
7	Initial	12:15 PM	30.0	7.99	0.12	2.13	0.39
	Final	12:45 PM		8.11			
8	Initial	12:46 PM	30.0	8.00	0.11	2.13	0.36
	Final	1:16 PM		8.11			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where: Q = Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

Grain Size Distribution

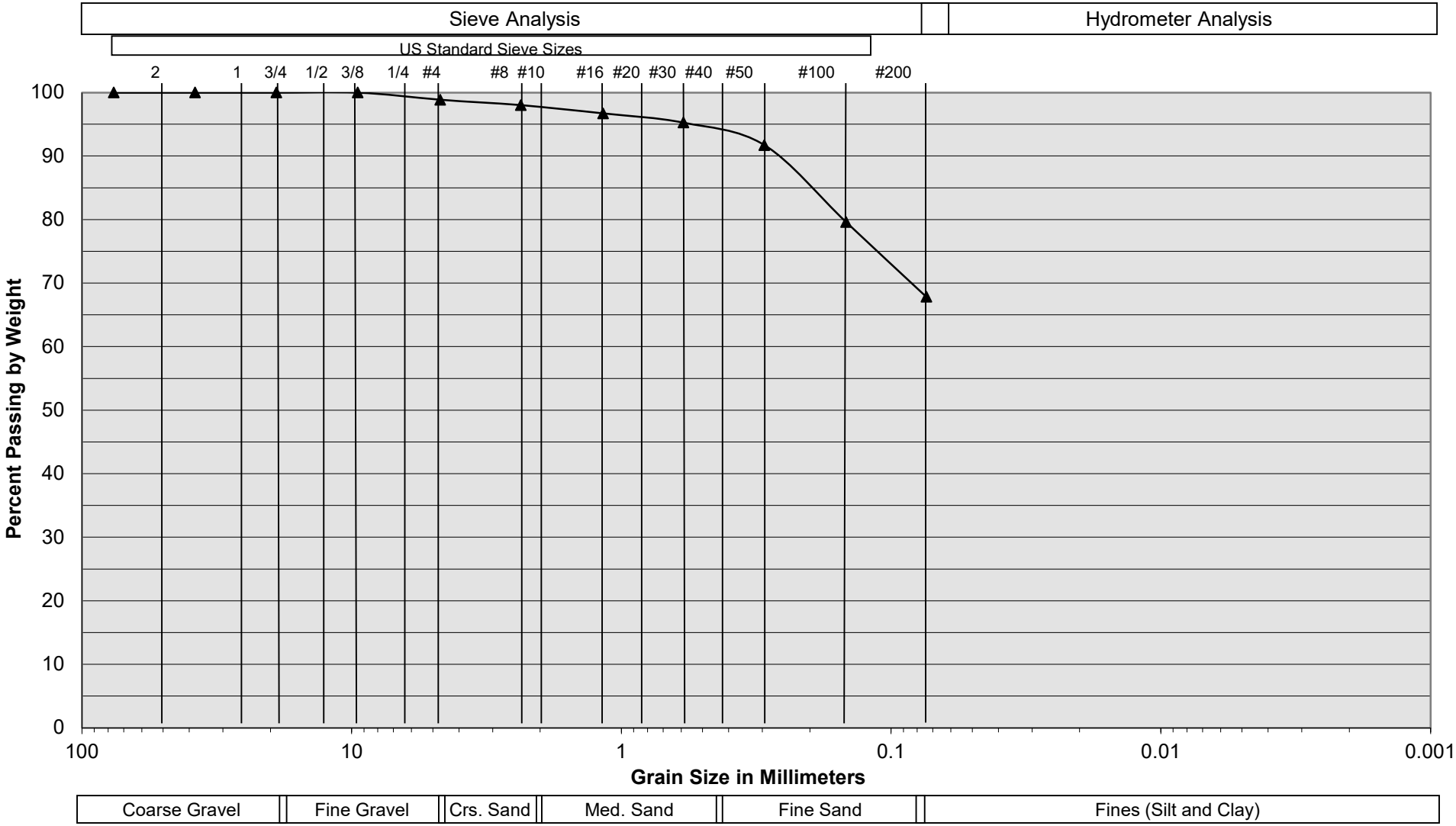


Sample Description	I-1 @ 8½ feet
Soil Classification	Brown Silty Clay, little fine Sand, trace medium Sand

Propsed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-2
PLATE C- 1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution



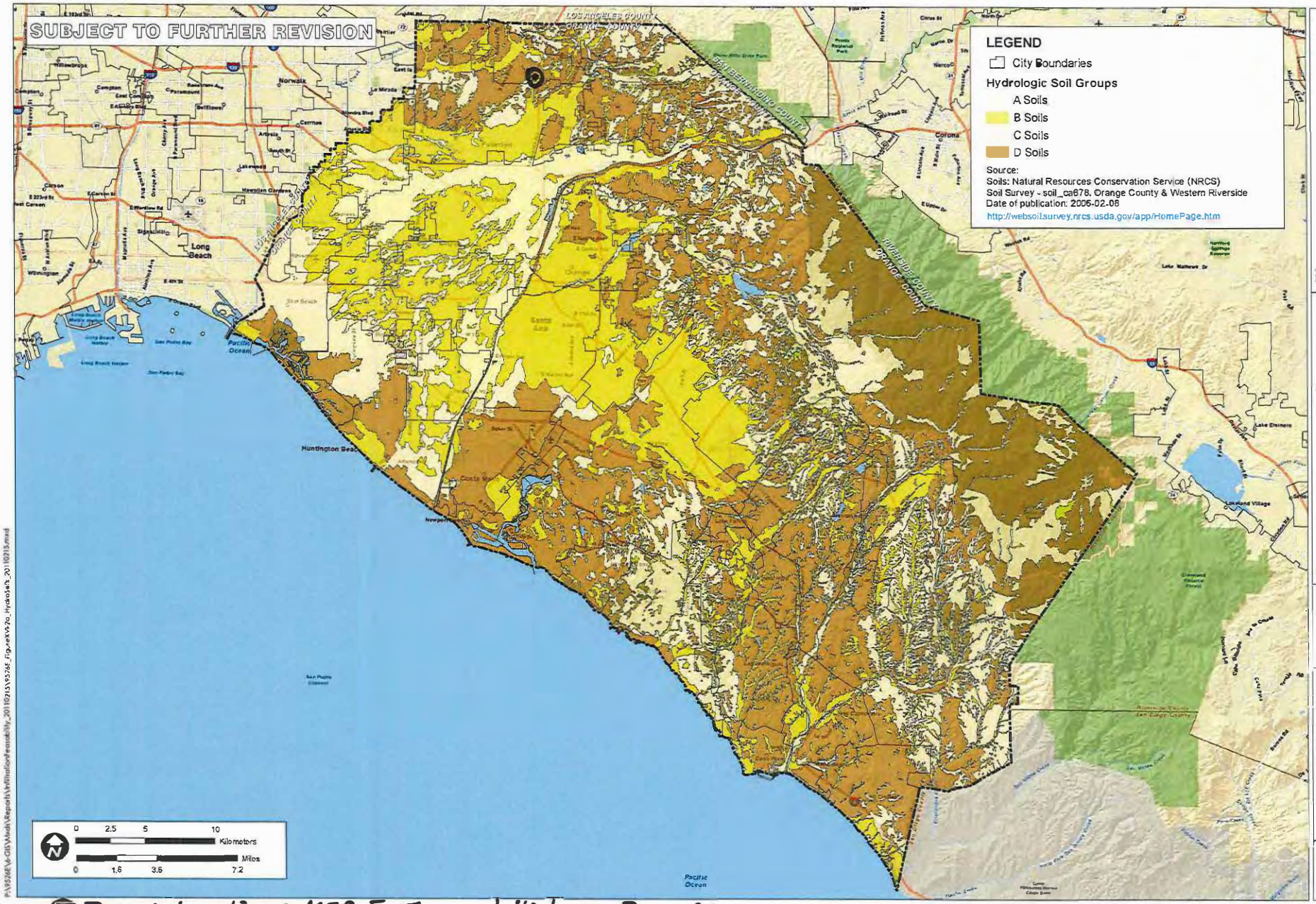
Sample Description	I-2 @ 8½ feet
Soil Classification	Brown fine Sandy Clay, little Silt, trace medium to coarse Sand

Propsed Brea Plaza Mixed Use
Brea, California
Project No. 20G168-2
PLATE C- 2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

APPENDIX G

NRCS HYDROLOGIC SOILS GROUPS MAP FOR ORANGE COUNTY



NRCS HYDROLOGIC SOILS GROUPS

ORANGE COUNTY INFILTRATION STUDY

CA

ORANGE CO.

PACE Advanced Water Engineering

FIGURE XVI-2a

Project Location: 1639 E. Imperial Highway, Brea, CA

APPENDIX H

OPERATION AND MAINTENANCE (O&M) PLAN

OPERATION AND MAINTENANCE (O&M) PLAN

Water Quality Management Plan
for

UPDATED BREA PLAZA REDEVELOPMENT PROJECT

1639 E. Imperial Highway
Brea, CA 92821

Appendix H, Operation and Maintenance Plan
Note: OWNER = BPI Brea LLC

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Non-Structural Source Control BMPs			
Y	N1. Education for Property Owners, Tenants and Occupants Educational materials shall be reviewed and made available on-site prior to commencement of operation of the Updated Brea Plaza Redevelopment Project. Refer to Appendices A and B of the Project WQMP for a list of applicable educational materials and BMP Fact Sheets. For developments with POA and residential projects of more than fifty (50) dwelling units, project conditions of approval will require that the POA periodically provide environmental awareness education materials, made available by the municipalities, to all of its members. Among other things, these materials will describe the use of chemicals (including household type) that should be limited to the property, with no discharge of wastes via hosing or other direct discharge to gutters, catch basins and storm drains. Educational materials available from the County of Orange can be downloaded here: http://www.ocwatersheds.com/PublicEd/resources/default.aspx	Frequency: Upon occupancy, and annually thereafter	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	N2. Activity Restrictions The owner shall include in any employee training manual, lease, and/or CCRs the on-site activity restrictions, including but not limited to: (1) No hosing down of any paved surface where the water would flow directly to the street, gutter or storm drain; (2) No car washing outside of established community car wash areas (if any); and (3) No disposal of wash water in the street, gutter or storm drain—all wash water must be disposed of in a mop sink or an area with a floor drain.	Frequency: Continuous	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com
Y	N3. Common Area Landscape Management Ongoing maintenance must be consistent with the City's adopted water conservation ordinance, plus fertilizer and pesticide usage consistent with the "County Management Guidelines for Use of Fertilizers and Pesticides." Landscaping irrigation systems shall be adjusted and properly maintained to prevent over spray runoffs. Green waste shall not be blown or swept into, or disposed of, in the street, gutter, public right-of-way, or storm drain catch basins or inlets. Leaf blowers, if used, shall be used to move green waste into piles so they can be swept and picked up and disposed of in green waste recycling containers.	Frequency: Weekly	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	N4. BMP Maintenance Owner shall be responsible for implementation of each non-structural BMP and regularly scheduled cleaning of all BMP structural facilities. Records of inspections and BMP maintenance shall be maintained by the owner and shall be available for review upon request.	Frequency: Continuous	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com
N	N5. Title 22 CCR Compliance		
N	N6. Local Water Quality Permit Compliance		
N	N7. Spill Contingency Plan		
N	N8. Underground Storage Tank Compliance		
N	N9. Hazardous Materials Disclosure Compliance		
N	N10. Uniform Fire Code Implementation		

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	N11. Common Area Litter Control The Owner shall provide an adequate number of trash receptacles on site. Litter patrol, emptying of trash receptacles, violation investigation, reporting and other litter control activities shall be performed in conjunction with maintenance activities.	Frequency: Weekly	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com
Y	N12. Employee Training The Owner shall prepare a training manual(s) for existing and future employees. The manual should include information on non-point source pollution and how to use proper Best Management Practices (BMPs) to minimize runoff pollutants. Training shall be provided upon hire and at regular intervals thereafter.	Frequency: Upon hire, and annually thereafter	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com
N	N13. Housekeeping of Loading Docks		
Y	N14. Common Area Catch Basin Inspection The catch basins will be inspected, cleaned and maintained on an annual basis, in the early fall prior to the start of the rainy season, and before and after all major storms.	Frequency: Annually, and before and after all major storms	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	N15. Street Sweeping Private Streets and Parking Lots The Owner or his agent must sweep all drive aisles and parking areas regularly (minimum monthly), and prior to the storm season (no later than October 1st each year). Sweeping shall be done with a vacuum-type sweeper. Under no circumstances are outdoor areas/lots to be rinsed or washed with water unless said rinse/wash water is collected and disposed of properly (i.e. into the sewer).	Frequency: Monthly	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
	Structural Source Control BMPs		
Y	S1. Provide Storm Drain System Stenciling and Signage Storm drain stencils are highly visible source control messages, typically placed directly adjacent to storm drain inlets. The stencils contain a brief statement that prohibits the dumping of improper materials into the municipal storm drain system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message. Stencils and signs alert the public to the destination of pollutants discharged into stormwater. The following requirements should be included in the project design and shown on the project plans: 1. Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language (such as: "NO DUMPING-DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping. 2. Post signs and prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area. 3. Maintain legibility of stencils and signs. See CASQA Stormwater Handbook BMP Fact Sheet SD-13 for additional information. Storm drain stencils shall be inspected for legibility, at a minimum, once prior to the storm season, and no later than October 1st of each year. Those signs determined to be illegible will be re-stenciled as soon as possible.	Frequency: Annually	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
N	S2. Design Outdoor Hazardous Material Storage Areas to Reduce Pollutant Introduction		
Y	S3. Design Trash Enclosures to Reduce Pollutant Introduction Trash storage areas will be designed to reduce pollutant introduction. All trash container areas will meet the following requirements: - Paved with an impervious surface, designed to not allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements around the area, screened or walled to prevent off-site transport of trash; and - Provide solid roof or awning to prevent exposure to direct precipitation. - No trash area drains will be connected to the MS4.	Frequency: Continuous	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	S4. Use Efficient Irrigation Systems & Landscape Design Projects shall design the timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the municipal storm drain system. The following methods to reduce excessive irrigation runoff shall be considered, and incorporated on common areas of development and other areas where determined applicable and feasible by the Permittee: 1. Employing rain shutoff devices to prevent irrigation after precipitation. 2. Designing irrigation systems to each landscape area's specific water requirements. 3. Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines. 4. Implementing landscape plan consistent with County Water Conservation Resolution or city equivalent, which may include provision of water sensors, programmable irrigation times (for short cycles), etc. 5. The timing and application methods of irrigation water shall be designed to minimize the runoff of excess irrigation water into the municipal storm drain system. 6. Employing other comparable, equally effective, methods to reduce irrigation water runoff. 7. Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider other design features, such as:	Frequency: Continuous	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	S4. Use Efficient Irrigation Systems & Landscape Design (cont'd) • Use mulches (such as wood chips or shredded wood products) in planter areas without ground cover to minimize sediment in runoff. • Install appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant material where possible and/or as recommended by the landscape architect. • Leave a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible. • Choose plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth. Irrigation practices shall comply with local and statewide ordinances related to irrigation efficiency.	Frequency: Continuous	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com
N	S5. Protect Slopes and Channels		
N	S6. Loading Dock Areas		
N	S7. Maintenance Bays and Docks		
N	S8. Vehicle Wash Areas		

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
N	S9. Outdoor Processing Areas		
N	S10. Equipment Wash Areas		
N	S11. Fueling Areas		
N	S12. Hillside Landscaping		
Y	S13. Wash Water Controls for Food Preparation Areas Owner shall ensure that the proposed restaurant shall have either contained areas or sinks, each with sanitary sewer connections for disposal of wash waters containing kitchen and food wastes. If located outside, the contained areas or sinks shall also be structurally covered to prevent entry of storm water. The Owner shall also provide adequate signs which are appropriately placed stating the prohibition of discharging wash water to the storm drain system.	Frequency: Continuous	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com
N	S14. Community Car Wash Racks		

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Low Impact Development BMPs			
Y	Treatment Control BMP #1 Proprietary Catch Basin Insert Filters (Oldcastle FloGard +Plus Insert Filters or Approved Equivalent) Twice a year, prior to and after the rainy season, and after major storm events, the catch basin insert filters shall be visually inspected for damage, have all sediment and debris removed, and the filter medium pouches shall be replaced if necessary. The owner may conduct this maintenance himself, or may enter into a service contract for the maintenance of the insert filters as detailed in the Oldcastle FloGard +Plus Specs/Maintenance Requirements brochure, a copy of which is attached hereto.	Frequency: Every Six Months (Approximately April 1st and October 1st) and Immediately After Major Storm Events	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	Biotreatment BMP # 1 Modular Wetlands System (BIO-7: Proprietary Biotreatment) The Modular Wetlands System units are to be maintained monthly as part of routine landscape maintenance activities, and shall be visually inspected monthly and immediately after major storm events to remove collected litter and foreign debris from the screening device. Every 12 to 24 months, the following maintenance should be performed: remove sediment from the Separation Chamber, replace the Cartridge Filter Media, and replace the Drain Down Filter Media. Additional/detailed maintenance instructions for the Modular Wetlands System are contained in the "Maintenance Guidelines for Modular Wetlands System," a copy of which is attached hereto.	Frequency: Screening Device Maintenance: Monthly And Immediately After Major Storm Events Separation Chamber, Cartridge Filter Media, and Drain Down Filter Media Maintenance: Every 12 to 24 Months	BPI Brea LLC (Owner) 417 S. Associated Road, Suite 313 Brea, CA 92821 Contact: Waad Nadhir wnadhir@bosc.com

Required Permits

No permits are required for the implementation, operation, and maintenance of the BMPs described in this plan.

Recordkeeping

All records must be maintained for at least five (5) years and must be made available for review upon request.

Oldcastle Infrastructure™
A CRH COMPANY

FLOGARD+PLUS®
CATCH BASIN INSERT FILTER

Inspection and Maintenance Guide

DRAINAGE PROTECTION SYSTEMS
DPS
A division of
Oldcastle Infrastructure

Water

SCOPE:

Federal, State and Local Clean Water Act regulations and those of insurance carriers require that stormwater filtration systems be maintained and serviced on a recurring basis. The intent of the regulations is to ensure that the systems, on a continuing basis, efficiently remove pollutants from stormwater runoff thereby preventing pollution of the nation's water resources. These specifications apply to the FloGard+Plus® Catch Basin Insert Filter.

RECOMMENDED FREQUENCY OF SERVICE:

Drainage Protection Systems (DPS) recommends that installed FloGard+Plus Catch Basin Insert Filters be serviced on a recurring basis. Ultimately, the frequency depends on the amount of runoff, pollutant loading and interference from debris (leaves, vegetation, cans, paper, etc.); however, it is recommended that each installation be serviced a minimum of three times per year, with a change of filter medium once per year. DPS technicians are available to do an on-site evaluation, upon request.

RECOMMENDED TIMING OF SERVICE:

DPS guidelines for the timing of service are as follows:

1. For areas with a definite rainy season: Prior to, during and following the rainy season.
2. For areas subject to year-round rainfall: On a recurring basis (at least three times per year).
3. For areas with winter snow and summer rain: Prior to and just after the snow season and during the summer rain season.
4. For installed devices not subject to the elements (wash racks, parking garages, etc.): On a recurring basis (no less than three times per year).

SERVICE PROCEDURES:

1. The catch basin grate shall be removed and set to one side. The catch basin shall be visually inspected for defects and possible illegal dumping. If illegal dumping has occurred, the proper authorities and property owner representative shall be notified as soon as practicable.
2. Using an industrial vacuum, the collected materials shall be removed from the liner. (Note: DPS uses a truck-mounted vacuum for servicing FloGard+Plus catch basin inserts).
3. When all of the collected materials have been removed, the filter medium pouches shall be removed by unsnapping the tether from the D-ring and set to one side. The filter liner, gaskets, stainless steel frame and mounting brackets, etc., shall be inspected for continued serviceability. Minor damage or defects found shall be corrected on-the-spot and a notation made on the Maintenance Record. More extensive deficiencies that affect the efficiency of the filter (torn liner, etc.), if approved by the customer representative, will be corrected and an invoice submitted to the representative along with the Maintenance Record.
4. The filter medium pouches shall be inspected for defects and continued serviceability and replaced as necessary, and the pouch tethers re-attached to the liner's D-ring.
5. The grate shall be replaced.

REPLACEMENT AND DISPOSAL OF EXPOSED FILTER MEDIUM AND COLLECTED DEBRIS

The frequency of filter medium exchange will be in accordance with the existing DPS-Customer Maintenance Contract. DPS recommends that the medium be changed at least once per year. During the appropriate service, or if so determined by the service technician during a non-scheduled service, the filter medium will be replaced with new material. Once the exposed pouches and debris have been removed, DPS has possession and must dispose of it in accordance with local, state and federal agency requirements.

DPS also has the capability of servicing all manner of storm drain filters, catch basin inserts and catch basins without inserts, underground oil/water separators, stormwater interceptors and other such devices. All DPS personnel are highly qualified technicians and are confined-space trained and certified. Call us at (888) 950-8826 for further information and assistance.

FLOGARD+PLUS®
CATCH BASIN INSERT FILTER

OUR MARKETS

BUILDING STRUCTURES

COMMUNICATIONS

WATER

ENERGY

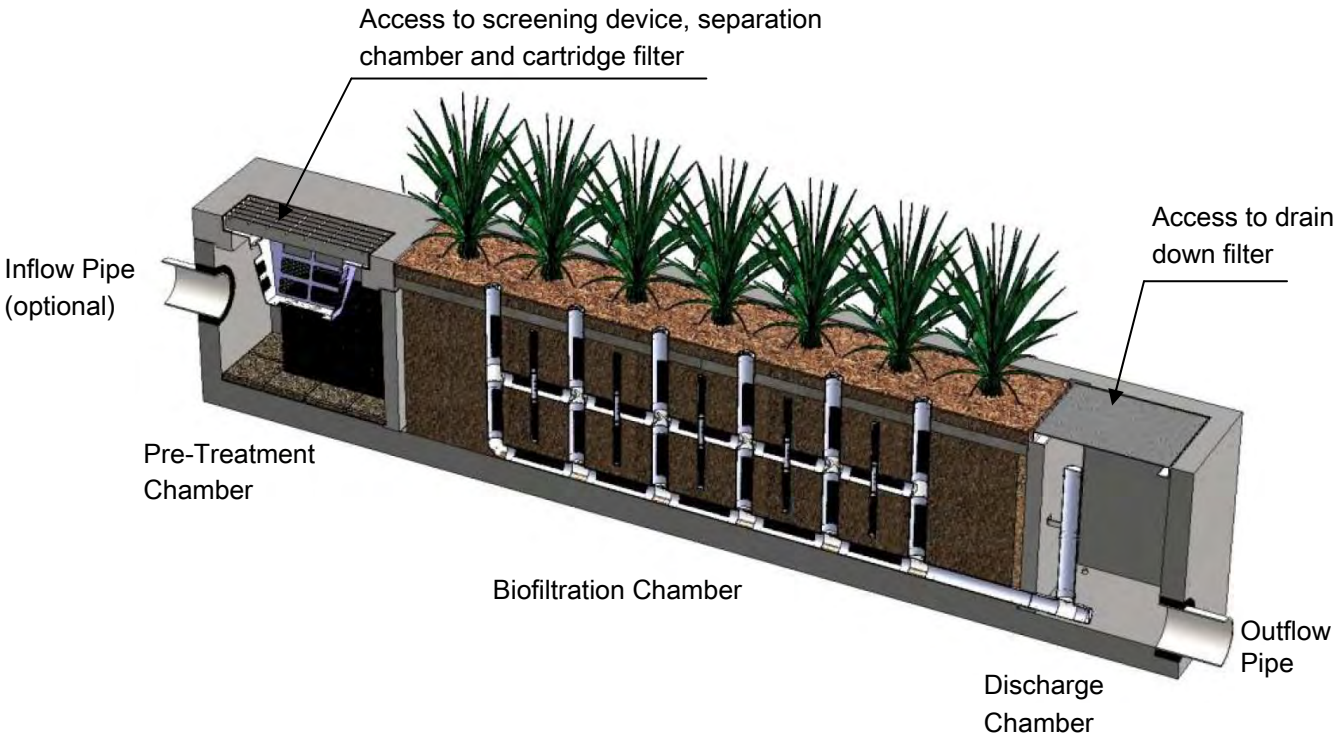
TRANSPORTATION

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

Screening Device

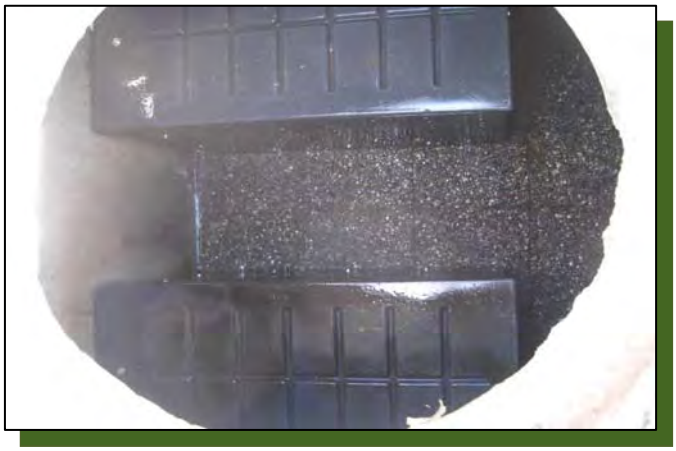
The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.

Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.



Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

APPENDIX I

RECORD OF BMP IMPLEMENTATION, MAINTENANCE AND INSPECTION

RECORD OF BMP IMPLEMENTATION, MAINTENANCE AND INSPECTION

Today's Date: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

APPENDIX J

INSPECTION REPORT FOR MODULAR WETLANDS SYSTEM;

CLEANING AND MAINTENANCE REPORT FOR MODULAR WETLANDS SYSTEM

Inspection Report
Modular Wetlands System

Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

APPENDIX K

NOTICE OF TRANSFER OF RESPONSIBILITY FOR WQMP

NOTICE OF TRANSFER OF RESPONSIBILITY

WATER QUALITY MANAGEMENT PLAN

UPDATED BREA PLAZA REDEVELOPMENT PROJECT

1639 E. Imperial Highway
Brea, CA 92821

Submission of this Notice of Transfer of Responsibility constitutes notice to the City of Brea that responsibility for the Water Quality Management Plan ("WQMP") for the subject property identified below, and implementation of that plan, is being transferred from the Previous Owner (and its agent) of the site (or a portion thereof) to the New Owner, as further described below.

I. Previous Owner/ Previous Responsible Party Information

Company/ Individual Name:		Contact Person:	
Street Address:		Title:	
City:	State:	ZIP:	Phone:

II. Information About Site Transferred

Name of Project (if applicable):	
Title of WQMP Applicable to site:	
Street Address of Site (if applicable):	
Planning Area (PA) and/ or Tract Number(s) for Site:	Lot Numbers (if Site is a portion of a tract):
Date WQMP Prepared (and revised if applicable):	

III. New Owner/ New Responsible Party Information

Company/ Individual Name:		Contact Person:	
Street Address:		Title:	
City:	State:	ZIP:	Phone:

IV. Ownership Transfer Information

General Description of Site Transferred to New Owner:	General Description of Portion of Project/ Parcel Subject to WQMP Retained by Owner (if any):

Lot/ Tract Numbers of Site Transferred to New Owner:
Remaining Lot/ Tract Numbers Subject to WQMP Still Held by Owner (if any):
Date of Ownership Transfer:

Note: When the Previous Owner is transferring a Site that is a portion of a larger project/ parcel addressed by the WQMP, as opposed to the entire project/parcel addressed by the WQMP, the General Description of the Site transferred and the remainder of the project/ parcel not transferred shall be set forth as maps attached to this notice. These maps shall show those portions of a project/ parcel addressed by the WQMP that are transferred to the New Owner (the Transferred Site), those portions retained by the Previous Owner, and those portions previously transferred by Previous Owner. Those portions retained by Previous Owner shall be labeled as "Previously Transferred".

V. Purpose of Notice of Transfer

The purposes of this Notice of Transfer of Responsibility are: 1) to track transfer of responsibility for implementation and amendment of the WQMP when property subject to the WQMP is transferred from the Previous Owner to the New Owner, and 2) to facilitate notification to a transferee of property subject to a WQMP that such New Owner is now the Responsible Party of record for the WQMP for those portions of the site that it owns.

VI. Certifications

A. Previous Owner

I hereby certify that _____is no longer the owner of the Transferred Site as described in Section II above. I have provided the New Owner with a copy of the WQMP applicable to the Transferred Site that the New Owner is acquiring from the Previous Owner.

Printed Name of Previous Owner Representative:	Title:
Signature:	Date:

B. New Owner

I hereby certify that _____is the owner of the Transferred Site, as described in Section II above, that I have been provided a copy of the WQMP, and that I have been informed and understand the New Owner's responsibilities related to the WQMP, its implementation, and Best Management Practices associated with it. I understand that by signing this notice, the New Owner is accepting all ongoing responsibilities for implementation and amendment of the WQMP for the Transferred Site, which the New Owner has acquired from the Previous Owner.

Printed Name of New Owner Representative:	Title:
Signature:	Date:

APPENDIX L

WINTR-55 PROGRAM HYDROLOGIC ANALYSIS REPORTS FOR THE UPDATED BREA PLAZA REDEVELOPMENT PROJECT

WinTR-55 Current Data Description

--- Identification Data ---

User:	487-5 WQMP	Date:	1/7/2025
Project:	Updated Brea Plaza Redevelop.	Units:	English
SubTitle:	Existing	Areal Units:	Acres
State:	California		
County:	Orange		
Filename:	S:\487-5 BREA PLAZA APARTMENTS\WQMP\WinTR-55 Existing Condition.w55		

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Total Area		Outlet	2.59	96	0.1

Total area: 2.59 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.05	.0	.0	.0	.0	.0	.0

Storm Data Source:	User-provided custom storm data
Rainfall Distribution Type:	Type I
Dimensionless Unit Hydrograph:	<standard>

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.05	.0	.0	.0	.0	.0	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: <standard>

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)
SUBAREAS	
Total Area	3.30
REACHES	
OUTLET	3.30

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)
SUBAREAS	
Total Area	3.30 9.93
REACHES	
OUTLET	3.30

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Total Area	2.59	0.100	96	Outlet	

Total Area: 2.59 (ac)

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Total Area							
SHEET	91	0.0330	0.011				0.019
SHALLOW	258	0.0039	0.025				0.056
					Time of Concentration		0.1

0.075 (rounded up to 0.1 by program)

Updated Brea Plaza Redevelop.
Existing
Orange County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Total Area	Open space; grass cover > 75% (good)	D	.229	80
	Paved parking lots, roofs, driveways	D	2.361	98
	Total Area / Weighted Curve Number		2.59	96

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
Updated Brea Plaza Redevelop.
Existing

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.05 Type I 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

Updated Brea Plaza Redevelop.
Existing

Name of printed page file:
TR20.out

Existing 2-yr runoff volume = 1.598 inches x 2.59 acres x 43,560 sf/ac x 1 ft/12 inches = 15,024 cf

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
Total Area	0.004		1.598		9.93	3.30	815.42

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
4.928	0.05	0.05	0.05	0.05	0.05	0.05	0.05
4.972	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.016	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.060	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.105	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.149	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.193	0.05	0.05	0.05	0.05	0.05	0.05	0.06
5.237	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.281	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.326	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.370	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.414	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.458	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.502	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.547	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.591	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.635	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.679	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.723	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.768	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.812	0.06	0.06	0.06	0.06	0.06	0.07	0.07
5.856	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.900	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.945	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.989	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.033	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.077	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.121	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.166	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.210	0.07	0.07	0.07	0.08	0.08	0.08	0.08
6.254	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.298	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.342	0.08	0.08	0.08	0.08	0.08	0.08	0.08

6.387	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.431	0.08	0.08	0.08	0.08	0.08	0.09	0.09
6.475	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.519	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.563	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.608	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.652	0.09	0.09	0.09	0.10	0.10	0.10	0.10

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
6.696	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.740	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.785	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.829	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.873	0.11	0.11	0.11	0.11	0.11	0.11	0.11
6.917	0.11	0.11	0.11	0.11	0.11	0.11	0.11
6.961	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.006	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.050	0.11	0.11	0.11	0.11	0.12	0.12	0.12
7.094	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.138	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.182	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.227	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.271	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.315	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.359	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.403	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.448	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.492	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.536	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.580	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.625	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.669	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.713	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.757	0.13	0.13	0.13	0.13	0.14	0.14	0.14
7.801	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.846	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.890	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.934	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.978	0.14	0.14	0.14	0.14	0.14	0.14	0.14
8.022	0.14	0.14	0.14	0.14	0.14	0.14	0.15
8.067	0.15	0.15	0.15	0.15	0.15	0.15	0.15
8.111	0.15	0.15	0.15	0.15	0.15	0.15	0.16
8.155	0.16	0.16	0.16	0.16	0.16	0.16	0.16
8.199	0.16	0.16	0.17	0.17	0.17	0.17	0.17
8.243	0.17	0.17	0.17	0.17	0.18	0.18	0.18
8.288	0.18	0.18	0.18	0.18	0.18	0.18	0.18
8.332	0.19	0.19	0.19	0.19	0.19	0.19	0.19
8.376	0.20	0.20	0.20	0.20	0.20	0.20	0.20
8.420	0.20	0.20	0.20	0.21	0.21	0.21	0.21
8.465	0.21	0.21	0.21	0.22	0.22	0.22	0.22
8.509	0.22	0.22	0.22	0.22	0.22	0.22	0.23
8.553	0.23	0.23	0.23	0.23	0.23	0.23	0.23
8.597	0.24	0.24	0.24	0.24	0.24	0.24	0.24
8.641	0.24	0.24	0.25	0.25	0.25	0.25	0.25
8.686	0.25	0.25	0.25	0.25	0.26	0.26	0.26
8.730	0.26	0.26	0.26	0.26	0.26	0.27	0.27
8.774	0.27	0.27	0.27	0.27	0.27	0.27	0.27
8.818	0.27	0.28	0.28	0.28	0.28	0.28	0.28
8.862	0.28	0.29	0.29	0.29	0.29	0.29	0.29
8.907	0.29	0.29	0.29	0.29	0.30	0.30	0.30

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96 .1

STREAM REACH:

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
8.951	0.30	0.30	0.30	0.30	0.31	0.31	0.31
8.995	0.31	0.31	0.31	0.31	0.31	0.31	0.32
9.039	0.32	0.32	0.32	0.32	0.33	0.33	0.33
9.083	0.33	0.33	0.33	0.34	0.34	0.34	0.34
9.128	0.34	0.34	0.35	0.35	0.35	0.35	0.36
9.172	0.36	0.36	0.36	0.37	0.37	0.37	0.37
9.216	0.37	0.37	0.38	0.38	0.38	0.38	0.39
9.260	0.39	0.39	0.39	0.40	0.40	0.40	0.40
9.305	0.40	0.41	0.41	0.41	0.41	0.41	0.42
9.349	0.42	0.42	0.42	0.43	0.43	0.43	0.44
9.393	0.44	0.44	0.44	0.44	0.44	0.45	0.45
9.437	0.45	0.45	0.46	0.46	0.46	0.46	0.47
9.481	0.47	0.47	0.47	0.48	0.48	0.48	0.49
9.526	0.49	0.50	0.51	0.53	0.54	0.56	0.58
9.570	0.60	0.61	0.63	0.64	0.65	0.66	0.67
9.614	0.69	0.70	0.71	0.74	0.76	0.79	0.83
9.658	0.86	0.89	0.93	0.96	0.99	1.01	1.04
9.702	1.06	1.08	1.10	1.12	1.15	1.19	1.24
9.747	1.30	1.36	1.42	1.48	1.54	1.59	1.64
9.791	1.69	1.73	1.76	1.80	1.84	1.89	1.95
9.835	2.04	2.14	2.25	2.37	2.50	2.62	2.74
9.879	2.86	2.96	3.05	3.13	3.20	3.25	3.28
9.923	3.30	3.30	3.28	3.25	3.20	3.14	3.07
9.968	3.01	2.94	2.88	2.82	2.77	2.73	2.70

WinTR-20: Version 1.10
ed Brea Plaza Redevelop.
Existing

0 0 0.05

(continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

10.012	2.66	2.61	2.55	2.48	2.39	2.28	2.15
10.056	2.02	1.88	1.75	1.63	1.52	1.41	1.32
10.100	1.25	1.19	1.13	1.09	1.05	1.01	0.98
10.145	0.95	0.93	0.90	0.88	0.86	0.85	0.83
10.189	0.82	0.81	0.80	0.79	0.79	0.78	0.77
10.233	0.77	0.76	0.75	0.74	0.73	0.73	0.72
10.277	0.71	0.71	0.70	0.69	0.69	0.69	0.68
10.321	0.68	0.68	0.67	0.66	0.66	0.65	0.64
10.366	0.64	0.63	0.62	0.62	0.61	0.61	0.60
10.410	0.60	0.60	0.59	0.59	0.58	0.58	0.57
10.454	0.56	0.55	0.55	0.54	0.53	0.53	0.52
10.498	0.52	0.52	0.51	0.51	0.51	0.50	0.50
10.542	0.49	0.49	0.48	0.48	0.47	0.47	0.47
10.587	0.46	0.46	0.46	0.45	0.45	0.45	0.45
10.631	0.45	0.44	0.44	0.44	0.44	0.44	0.43
10.675	0.43	0.43	0.43	0.43	0.43	0.42	0.42
10.719	0.42	0.42	0.42	0.42	0.42	0.42	0.41
10.763	0.41	0.41	0.41	0.41	0.41	0.40	0.40
10.808	0.40	0.40	0.40	0.40	0.40	0.40	0.40
10.852	0.39	0.39	0.39	0.39	0.39	0.39	0.38
10.896	0.38	0.38	0.38	0.38	0.38	0.38	0.38
10.940	0.38	0.37	0.37	0.37	0.37	0.37	0.37
10.985	0.36	0.36	0.36	0.36	0.36	0.36	0.36
11.029	0.36	0.36	0.36	0.35	0.35	0.35	0.35
11.073	0.35	0.35	0.35	0.35	0.35	0.34	0.34
11.117	0.34	0.34	0.34	0.34	0.34	0.34	0.34
11.161	0.34	0.34	0.34	0.34	0.34	0.34	0.34

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05 (continued)
ed Brea Plaza Redevelop.
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.206	0.34	0.33	0.33	0.33	0.33	0.33	0.33
11.250	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.294	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.338	0.33	0.33	0.32	0.32	0.32	0.32	0.32
11.382	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.427	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.471	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.515	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.559	0.31	0.31	0.31	0.31	0.31	0.31	0.30
11.603	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.648	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.692	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.736	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.780	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.825	0.29	0.29	0.29	0.29	0.29	0.29	0.28
11.869	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.913	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.957	0.28	0.28	0.28	0.28	0.27	0.27	0.27
12.001	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.046	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.090	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.134	0.27	0.26	0.26	0.26	0.26	0.26	0.26
12.178	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.222	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.267	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.311	0.26	0.26	0.26	0.26	0.26	0.25	0.25
12.355	0.25	0.25	0.25	0.25	0.25	0.25	0.25

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

12.399	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.443	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.488	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.532	0.25	0.25	0.25	0.24	0.24	0.24	0.24
12.576	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.620	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.665	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.709	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.753	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.797	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.841	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.886	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.930	0.23	0.23	0.23	0.23	0.22	0.22	0.22
12.974	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.018	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.062	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.107	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.151	0.22	0.21	0.21	0.21	0.21	0.21	0.21
13.195	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.239	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.283	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.328	0.21	0.21	0.21	0.21	0.20	0.20	0.20
13.372	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.416	0.20	0.20	0.20	0.20	0.20	0.20	0.20

Line
Start Time ---------- Flow Values @ time increment of 0.006 hr ----------

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
13.460	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.505	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.549	0.20	0.19	0.19	0.19	0.19	0.19	0.19
13.593	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.637	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.681	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.726	0.19	0.19	0.19	0.19	0.19	0.18	0.18
13.770	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.814	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.858	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.902	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.947	0.18	0.17	0.17	0.17	0.17	0.17	0.17
13.991	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.035	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.079	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.123	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.168	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.212	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.256	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.300	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.345	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.389	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.433	0.17	0.16	0.16	0.16	0.16	0.16	0.16
14.477	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.521	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.566	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.610	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.654	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.698	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.742	0.16	0.16	0.16	0.16	0.16	0.16	0.16

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total Area Outlet .00405 96. .1

STREAM REACH:

14.787	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.831	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.875	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.919	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.963	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.008	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.052	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.096	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.140	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.185	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.229	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.273	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.317	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.361	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.406	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.450	0.16	0.16	0.15	0.15	0.15	0.15	0.15
15.494	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.538	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.582	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.627	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.671	0.15	0.15	0.15	0.15	0.15	0.15	0.15

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
15.715	0.15	0.15	0.15	0.15	0.15	0.15	0.15

WinTR-20: Version 1.10
ed Brea Plaza Redevelop.
Existing

0 0 0.05 (continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

15.759	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.803	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.848	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.892	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.936	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.980	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.025	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.069	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.113	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.157	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.201	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.246	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.290	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.334	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.378	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.422	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.467	0.15	0.14	0.14	0.14	0.14	0.14	0.14
16.511	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.555	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.599	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.643	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.688	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.732	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.776	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.820	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.865	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.909	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.953	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.997	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.041	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.086	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.130	0.14	0.14	0.14	0.14	0.14	0.14	0.14

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

17.174	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.218	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.262	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.307	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.351	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.395	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.439	0.14	0.14	0.14	0.14	0.14	0.13	0.13
17.483	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.528	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.572	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.616	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.660	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.705	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.749	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.793	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.837	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.881	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.926	0.13	0.13	0.13	0.13	0.13	0.13	0.13

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
17.970	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.014	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.058	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.102	0.13	0.13	0.13	0.13	0.13	0.13	0.13

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

18.147	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.191	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.235	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.279	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.323	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.368	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.412	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.456	0.13	0.13	0.12	0.12	0.12	0.12	0.12
18.500	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.545	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.589	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.633	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.677	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.721	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.766	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.810	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.854	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.898	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.942	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.987	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.031	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.075	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.119	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.163	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.208	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.252	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.296	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.340	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.385	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.429	0.12	0.12	0.12	0.12	0.12	0.11	0.11
19.473	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.517	0.11	0.11	0.11	0.11	0.11	0.11	0.11

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

19.561	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.606	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.650	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.694	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.738	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.782	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.827	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.871	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.915	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.959	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.003	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.048	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.092	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.136	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.180	0.11	0.11	0.11	0.11	0.11	0.11	0.11

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
20.225	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.269	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.313	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.357	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.401	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.446	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.490	0.10	0.10	0.10	0.10	0.10	0.10	0.10

WinTR-20: Version 1.10 0 0 0.05

ed Brea Plaza Redevelop. (continued)

Existing

STORM 2-Yr

SUB-AREA:

Total AreaOutlet .00405 96. .1

STREAM REACH:

20.534	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.578	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.622	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.667	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.711	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.755	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.799	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.843	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.888	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.932	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.976	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.020	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.065	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.109	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.153	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.197	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.241	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.286	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.330	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.374	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.418	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.462	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.507	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.551	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.595	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.639	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.683	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.728	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.772	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.816	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.860	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.905	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10
ed Brea Plaza Redevelop.
Existing

0 0 0.05 (continued)

STORM 2-Yr

SUB-AREA:
Total Area Outlet .00405 96. .1

STREAM REACH:

21.949	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.993	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.037	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.081	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.126	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.170	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.214	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.258	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.302	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.347	0.09	0.09	0.09	0.09	0.09	0.09	0.08
22.391	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.435	0.08	0.08	0.08	0.08	0.08	0.08	0.08

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
22.479	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.523	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.568	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.612	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.656	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.700	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.745	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.789	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.833	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.877	0.08	0.08	0.08	0.08	0.08	0.08	0.08

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop.
Existing (continued)

ST●RM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

22.921	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.966	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.010	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.054	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.098	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.142	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.187	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.231	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.275	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.319	0.08	0.08	0.08	0.08	0.08	0.08	0.07
23.363	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.408	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.452	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.496	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.540	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.585	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.629	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.673	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.717	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.761	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.806	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.850	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.894	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.938	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.982	0.07	0.07	0.07	0.07	0.07	0.07	0.07
24.027	0.06	0.06	0.06	0.05			

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
OUTLET	0.004		1.598		9.93	3.30	815.42

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 ed Brea Plaza Redevelop. Existing 0 0 0.05 (continued)

STORM 2-Yr

SUB-AREA:

Total AreaOutlet	.00405	96.	.1

STREAM REACH:

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
4.928	0.05	0.05	0.05	0.05	0.05	0.05	0.05
4.972	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.016	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.060	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Updated Brea Plaza Redevelop. Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
5.105	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.149	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.193	0.05	0.05	0.05	0.05	0.05	0.05	0.06
5.237	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.281	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.326	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.370	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.414	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.458	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.502	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.547	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.591	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.635	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

5.679	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.723	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.768	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.812	0.06	0.06	0.06	0.06	0.06	0.07	0.07
5.856	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.900	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.945	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.989	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.033	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.077	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.121	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.166	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.210	0.07	0.07	0.07	0.08	0.08	0.08	0.08
6.254	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.298	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.342	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.387	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.431	0.08	0.08	0.08	0.08	0.08	0.09	0.09
6.475	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.519	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.563	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.608	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.652	0.09	0.09	0.09	0.10	0.10	0.10	0.10
6.696	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.740	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.785	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.829	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.873	0.11	0.11	0.11	0.11	0.11	0.11	0.11
6.917	0.11	0.11	0.11	0.11	0.11	0.11	0.11
6.961	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.006	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.050	0.11	0.11	0.11	0.11	0.12	0.12	0.12

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

7.094	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.138	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.182	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.227	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.271	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.315	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
7.359	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.403	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.448	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.492	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.536	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.580	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.625	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.669	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.713	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.757	0.13	0.13	0.13	0.13	0.14	0.14	0.14
7.801	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.846	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.890	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.934	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.978	0.14	0.14	0.14	0.14	0.14	0.14	0.14
8.022	0.14	0.14	0.14	0.14	0.14	0.14	0.15

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

8.067	0.15	0.15	0.15	0.15	0.15	0.15	0.15
8.111	0.15	0.15	0.15	0.15	0.15	0.15	0.16
8.155	0.16	0.16	0.16	0.16	0.16	0.16	0.16
8.199	0.16	0.16	0.17	0.17	0.17	0.17	0.17
8.243	0.17	0.17	0.17	0.17	0.18	0.18	0.18
8.288	0.18	0.18	0.18	0.18	0.18	0.18	0.18
8.332	0.19	0.19	0.19	0.19	0.19	0.19	0.19
8.376	0.20	0.20	0.20	0.20	0.20	0.20	0.20
8.420	0.20	0.20	0.20	0.21	0.21	0.21	0.21
8.465	0.21	0.21	0.21	0.22	0.22	0.22	0.22
8.509	0.22	0.22	0.22	0.22	0.22	0.22	0.23
8.553	0.23	0.23	0.23	0.23	0.23	0.23	0.23
8.597	0.24	0.24	0.24	0.24	0.24	0.24	0.24
8.641	0.24	0.24	0.25	0.25	0.25	0.25	0.25
8.686	0.25	0.25	0.25	0.25	0.26	0.26	0.26
8.730	0.26	0.26	0.26	0.26	0.26	0.27	0.27
8.774	0.27	0.27	0.27	0.27	0.27	0.27	0.27
8.818	0.27	0.28	0.28	0.28	0.28	0.28	0.28
8.862	0.28	0.29	0.29	0.29	0.29	0.29	0.29
8.907	0.29	0.29	0.29	0.29	0.30	0.30	0.30
8.951	0.30	0.30	0.30	0.30	0.31	0.31	0.31
8.995	0.31	0.31	0.31	0.31	0.31	0.31	0.32
9.039	0.32	0.32	0.32	0.32	0.33	0.33	0.33
9.083	0.33	0.33	0.33	0.34	0.34	0.34	0.34
9.128	0.34	0.34	0.35	0.35	0.35	0.35	0.36
9.172	0.36	0.36	0.36	0.37	0.37	0.37	0.37
9.216	0.37	0.37	0.38	0.38	0.38	0.38	0.39
9.260	0.39	0.39	0.39	0.40	0.40	0.40	0.40
9.305	0.40	0.41	0.41	0.41	0.41	0.41	0.42
9.349	0.42	0.42	0.42	0.43	0.43	0.43	0.44
9.393	0.44	0.44	0.44	0.44	0.44	0.45	0.45
9.437	0.45	0.45	0.46	0.46	0.46	0.46	0.47

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

9.481	0.47	0.47	0.47	0.48	0.48	0.48	0.49
9.526	0.49	0.50	0.51	0.53	0.54	0.56	0.58
9.570	0.60	0.61	0.63	0.64	0.65	0.66	0.67

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
9.614	0.69	0.70	0.71	0.74	0.76	0.79	0.83
9.658	0.86	0.89	0.93	0.96	0.99	1.01	1.04
9.702	1.06	1.08	1.10	1.12	1.15	1.19	1.24
9.747	1.30	1.36	1.42	1.48	1.54	1.59	1.64
9.791	1.69	1.73	1.76	1.80	1.84	1.89	1.95
9.835	2.04	2.14	2.25	2.37	2.50	2.62	2.74
9.879	2.86	2.96	3.05	3.13	3.20	3.25	3.28
9.923	3.30	3.30	3.28	3.25	3.20	3.14	3.07
9.968	3.01	2.94	2.88	2.82	2.77	2.73	2.70
10.012	2.66	2.61	2.55	2.48	2.39	2.28	2.15
10.056	2.02	1.88	1.75	1.63	1.52	1.41	1.32
10.100	1.25	1.19	1.13	1.09	1.05	1.01	0.98
10.145	0.95	0.93	0.90	0.88	0.86	0.85	0.83
10.189	0.82	0.81	0.80	0.79	0.79	0.78	0.77
10.233	0.77	0.76	0.75	0.74	0.73	0.73	0.72
10.277	0.71	0.71	0.70	0.69	0.69	0.69	0.68
10.321	0.68	0.68	0.67	0.66	0.66	0.65	0.64
10.366	0.64	0.63	0.62	0.62	0.61	0.61	0.60
10.410	0.60	0.60	0.59	0.59	0.58	0.58	0.57

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop.
Existing

(continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

10.454	0.56	0.55	0.55	0.54	0.53	0.53	0.52
10.498	0.52	0.52	0.51	0.51	0.51	0.50	0.50
10.542	0.49	0.49	0.48	0.48	0.47	0.47	0.47
10.587	0.46	0.46	0.46	0.45	0.45	0.45	0.45
10.631	0.45	0.44	0.44	0.44	0.44	0.44	0.43
10.675	0.43	0.43	0.43	0.43	0.43	0.42	0.42
10.719	0.42	0.42	0.42	0.42	0.42	0.42	0.41
10.763	0.41	0.41	0.41	0.41	0.41	0.40	0.40
10.808	0.40	0.40	0.40	0.40	0.40	0.40	0.40
10.852	0.39	0.39	0.39	0.39	0.39	0.39	0.38
10.896	0.38	0.38	0.38	0.38	0.38	0.38	0.38
10.940	0.38	0.37	0.37	0.37	0.37	0.37	0.37
10.985	0.36	0.36	0.36	0.36	0.36	0.36	0.36
11.029	0.36	0.36	0.36	0.35	0.35	0.35	0.35
11.073	0.35	0.35	0.35	0.35	0.35	0.34	0.34
11.117	0.34	0.34	0.34	0.34	0.34	0.34	0.34
11.161	0.34	0.34	0.34	0.34	0.34	0.34	0.34
11.206	0.34	0.33	0.33	0.33	0.33	0.33	0.33
11.250	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.294	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.338	0.33	0.33	0.32	0.32	0.32	0.32	0.32
11.382	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.427	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.471	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.515	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.559	0.31	0.31	0.31	0.31	0.31	0.31	0.30
11.603	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.648	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.692	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.736	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.780	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.825	0.29	0.29	0.29	0.29	0.29	0.29	0.28

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.869	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.913	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.957	0.28	0.28	0.28	0.28	0.27	0.27	0.27
12.001	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.046	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.090	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.134	0.27	0.26	0.26	0.26	0.26	0.26	0.26
12.178	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.222	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.267	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.311	0.26	0.26	0.26	0.26	0.26	0.25	0.25
12.355	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.399	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.443	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.488	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.532	0.25	0.25	0.25	0.24	0.24	0.24	0.24
12.576	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.620	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.665	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.709	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.753	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.797	0.23	0.23	0.23	0.23	0.23	0.23	0.23

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

12.841	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.886	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.930	0.23	0.23	0.23	0.23	0.22	0.22	0.22
12.974	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.018	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.062	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.107	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.151	0.22	0.21	0.21	0.21	0.21	0.21	0.21
13.195	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.239	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.283	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.328	0.21	0.21	0.21	0.21	0.20	0.20	0.20
13.372	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.416	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.460	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.505	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.549	0.20	0.19	0.19	0.19	0.19	0.19	0.19
13.593	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.637	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.681	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.726	0.19	0.19	0.19	0.19	0.19	0.18	0.18
13.770	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.814	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.858	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.902	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.947	0.18	0.17	0.17	0.17	0.17	0.17	0.17
13.991	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.035	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.079	0.17	0.17	0.17	0.17	0.17	0.17	0.17

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:
Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
14.123	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.168	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.212	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.256	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.300	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.345	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.389	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.433	0.17	0.16	0.16	0.16	0.16	0.16	0.16
14.477	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.521	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.566	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.610	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.654	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.698	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.742	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.787	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.831	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.875	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.919	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.963	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.008	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.052	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.096	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.140	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.185	0.16	0.16	0.16	0.16	0.16	0.16	0.16

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

15.229	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.273	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.317	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.361	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.406	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.450	0.16	0.16	0.15	0.15	0.15	0.15	0.15
15.494	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.538	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.582	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.627	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.671	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.715	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.759	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.803	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.848	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.892	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.936	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.980	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.025	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.069	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.113	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.157	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.201	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.246	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.290	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.334	0.15	0.15	0.15	0.15	0.15	0.15	0.15

WinTR-20: Version 1.10 0 0 0.05 (continued)
ed Brea Plaza Redevelop.
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:
Line
Start Time ---------- Flow Values @ time increment of 0.006 hr ----------
(hr) (cfs) (cfs) (cfs) (cfs) (cfs) (cfs) (cfs)

16.378	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.422	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.467	0.15	0.14	0.14	0.14	0.14	0.14	0.14
16.511	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.555	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.599	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.643	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.688	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.732	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.776	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.820	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.865	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.909	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.953	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.997	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.041	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.086	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.130	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.174	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.218	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.262	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.307	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.351	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.395	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.439	0.14	0.14	0.14	0.14	0.14	0.13	0.13
17.483	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.528	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.572	0.13	0.13	0.13	0.13	0.13	0.13	0.13

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

17.616	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.660	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.705	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.749	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.793	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.837	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.881	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.926	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.970	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.014	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.058	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.102	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.147	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.191	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.235	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.279	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.323	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.368	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.412	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.456	0.13	0.13	0.12	0.12	0.12	0.12	0.12
18.500	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.545	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.589	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

18.633	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.677	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.721	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.766	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.810	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.854	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.898	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.942	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.987	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.031	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.075	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.119	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.163	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.208	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.252	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.296	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.340	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.385	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.429	0.12	0.12	0.12	0.12	0.12	0.11	0.11
19.473	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.517	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.561	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.606	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.650	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.694	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.738	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.782	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.827	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.871	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.915	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.959	0.11	0.11	0.11	0.11	0.11	0.11	0.11

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop.
Existing
(continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

20.003	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.048	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.092	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.136	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.180	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.225	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.269	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.313	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.357	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.401	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.446	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.490	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.534	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.578	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.622	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.667	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.711	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.755	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.799	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.843	0.10	0.10	0.10	0.10	0.10	0.10	0.10

Updated Brea Plaza Redevelop.
Existing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
20.888	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.932	0.10	0.10	0.10	0.10	0.10	0.10	0.10

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

20.976	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.020	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.065	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.109	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.153	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.197	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.241	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.286	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.330	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.374	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.418	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.462	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.507	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.551	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.595	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.639	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.683	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.728	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.772	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.816	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.860	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.905	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.949	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.993	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.037	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.081	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.126	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.170	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.214	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.258	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.302	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.347	0.09	0.09	0.09	0.09	0.09	0.09	0.08

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

22.391	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.435	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.479	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.523	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.568	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.612	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.656	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.700	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.745	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.789	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.833	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.877	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.921	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.966	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.010	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.054	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.098	0.08	0.08	0.08	0.08	0.08	0.08	0.08

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
23.142	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.187	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.231	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.275	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.319	0.08	0.08	0.08	0.08	0.08	0.08	0.07

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

23.363	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.408	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.452	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.496	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.540	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.585	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.629	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.673	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.717	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.761	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.806	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.850	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.894	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.938	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.982	0.07	0.07	0.07	0.07	0.07	0.07	0.07
24.027	0.06	0.06	0.06	0.05			

WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

Updated Brea Plaza Redevelop.
Existing

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
Total Area	0.004		3.30				
OUTLET	0.004		3.30				

WinTR-20: Version 1.10 0 0 0.05 (continued)
ed Brea Plaza Redevelop.
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:

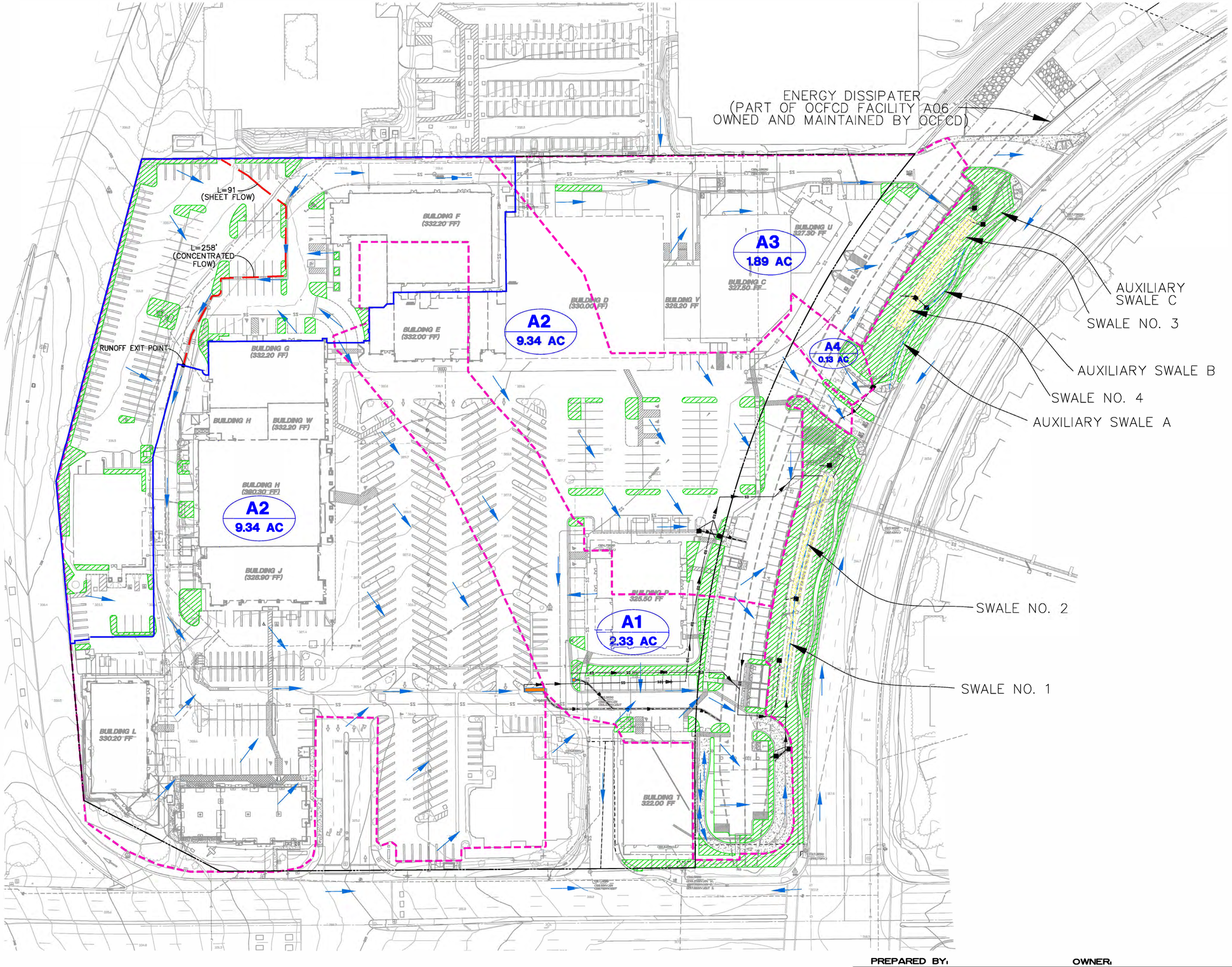
WinTR-20 Printed Page File TR20.inp Beginning of Input Data List

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Existing

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .1

STREAM REACH:



PROJECT DATA:

EXISTING SITE DRAINAGE AREAS (TOTAL): 13.69 AC (596,336 SF)

PROPOSED PROJECT AREA: 2.59 AC (112,817 SF)
EXISTING IMPERVIOUS AREA: 91.2% (102,833 SF)
EXISTING PERVIOUS AREA: 8.8% (9,984 SF)

CURRENT USE: COMMERCIAL

WATERSHED:
SAN GABRIEL–COYOTE CREEK WATERSHED

LEGEND — STRUCTURAL / TREATMENT BMPS

- LANDSCAPE AREA EFFICIENT IRRIGATION
  LANDSCAPE AREA RUNOFF–MINIMIZING DESIGN
- CATCH BASIN / STORM DRAIN INLET
- FLOW PATTERN
- EXISTING DRAINAGE AREAS A1
- PROPOSED PROJECT AREA
- VEGETATED SWALE
- SD — LOW FLOW STORM DRAIN
- HIGH FLOW STORM DRAIN
- FLOW PATH

NORTH

CA

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 Inch = 50 ft.

PREPARED BY:

CA ENGINEERING, INC.
Planning • Engineering • Surveying
4101 BIRCH STREET
NEWPORT BEACH, CA, 92660
949-724-9480 949-724-9484 FAX

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CONTACT: WAAD J. NADHIR
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CITY OF BREA
WATER QUALITY MANAGEMENT PLAN
EXISTING WQMP DRAINAGE AREAS
BREA PLAZA
IMPERIAL HIGHWAY

SHEET 1 OF 1

\\CA-SVR1\Shared\487-5 BREA PLAZA\DRAWINGS\WQMP\487-5 EX WQMP Site Planning Last Modified: 17 Sep 2024 - 2:49pm
Plotted on: 18 Sep 2024 - 4:20pm by waad

WinTR-55 Current Data Description

--- Identification Data ---

User:	487-5 WQMP	Date:	1/7/2025
Project:	Updated Brea Plaza Redevelop.	Units:	English
SubTitle:	Proposed	Areal Units:	Acres
State:	California		
County:	Orange		
Filename:	S:\487-5 BREA PLAZA APARTMENTS\WQMP\WinTR-55 Proposed Condition.w55		

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Total Area		Outlet	2.59	96	.129

Total area: 2.59 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.05	.0	.0	.0	.0	.0	.0

Storm Data Source:	User-provided custom storm data
Rainfall Distribution Type:	Type I
Dimensionless Unit Hydrograph:	<standard>

Updated Brea Plaza Redevelop.
Proposed
Orange County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.05	.0	.0	.0	.0	.0	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: <standard>

Updated Brea Plaza Redevelop.
Proposed
Orange County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)
SUBAREAS	
Total Area	3.15
REACHES	
OUTLET	3.15

Updated Brea Plaza Redevelop.
Proposed
Orange County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)
SUBAREAS	
Total Area	3.15 9.95
REACHES	
OUTLET	3.15

Updated Brea Plaza Redevelop.
Proposed
Orange County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Total Area	2.59	0.129	96	Outlet	

Total Area: 2.59 (ac)

Updated Brea Plaza Redevelop.
Proposed
Orange County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Total Area							
SHEET	58	0.0200	0.011				0.016
SHALLOW	253	0.0070	0.025				0.041
CHANNEL	407	0.0050	0.013	0.09	1.05	1.570	0.072
					Time of Concentration		.129

Updated Brea Plaza Redevelop.
Proposed
Orange County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Total Area	Open space; grass cover > 75% (good)	D	.324	80
	Paved parking lots, roofs, driveways	D	2.266	98
	Total Area / Weighted Curve Number		2.59	96

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
Updated Brea Plaza Redevelop.
Proposed

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.05 Type I 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

Updated Brea Plaza Redevelop.
Proposed

Name of printed page file:
TR20.out

Proposed 2-yr runoff volume =
1.597 inches x 2.59 acres x 43,560 sf/ac x
1 ft/12 inches = 15,015 cf

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
Total Area	0.004		1.597		9.95	3.15	777.54

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
4.953	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.010	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.067	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.124	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.181	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.238	0.05	0.05	0.06	0.06	0.06	0.06	0.06
5.295	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.352	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.409	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.466	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.523	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.580	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.637	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.694	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.751	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.808	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.865	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.922	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.979	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.036	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.093	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.150	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.207	0.07	0.07	0.07	0.07	0.07	0.07	0.08
6.264	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.321	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.378	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.435	0.08	0.08	0.08	0.08	0.08	0.08	0.09
6.493	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.550	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.607	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.664	0.09	0.09	0.09	0.10	0.10	0.10	0.10
6.721	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.778	0.10	0.10	0.10	0.10	0.10	0.10	0.10

6.835	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.892	0.10	0.11	0.11	0.11	0.11	0.11	0.11
6.949	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.006	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.063	0.11	0.11	0.11	0.11	0.11	0.12	0.12
7.120	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.177	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
7.234	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.291	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.348	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.405	0.12	0.12	0.12	0.13	0.13	0.13	0.13
7.462	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.519	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.576	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.633	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.690	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.747	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.804	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.861	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.918	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.975	0.14	0.14	0.14	0.14	0.14	0.14	0.14
8.032	0.14	0.14	0.14	0.14	0.14	0.14	0.15
8.089	0.15	0.15	0.15	0.15	0.15	0.15	0.15
8.146	0.15	0.15	0.15	0.16	0.16	0.16	0.16
8.203	0.16	0.16	0.16	0.16	0.17	0.17	0.17
8.261	0.17	0.17	0.17	0.17	0.18	0.18	0.18
8.318	0.18	0.18	0.18	0.18	0.19	0.19	0.19
8.375	0.19	0.19	0.19	0.20	0.20	0.20	0.20
8.432	0.20	0.20	0.20	0.20	0.21	0.21	0.21
8.489	0.21	0.21	0.21	0.22	0.22	0.22	0.22
8.546	0.22	0.22	0.22	0.23	0.23	0.23	0.23
8.603	0.23	0.23	0.23	0.24	0.24	0.24	0.24
8.660	0.24	0.24	0.25	0.25	0.25	0.25	0.25
8.717	0.25	0.25	0.26	0.26	0.26	0.26	0.26
8.774	0.26	0.26	0.27	0.27	0.27	0.27	0.27
8.831	0.27	0.27	0.28	0.28	0.28	0.28	0.28
8.888	0.28	0.29	0.29	0.29	0.29	0.29	0.29
8.945	0.29	0.30	0.30	0.30	0.30	0.30	0.30
9.002	0.31	0.31	0.31	0.31	0.31	0.31	0.32
9.059	0.32	0.32	0.32	0.33	0.33	0.33	0.33
9.116	0.33	0.34	0.34	0.34	0.34	0.34	0.35
9.173	0.35	0.35	0.36	0.36	0.36	0.36	0.37
9.230	0.37	0.37	0.37	0.38	0.38	0.38	0.39
9.287	0.39	0.39	0.40	0.40	0.40	0.40	0.41
9.344	0.41	0.41	0.42	0.42	0.42	0.43	0.43
9.401	0.43	0.43	0.44	0.44	0.44	0.44	0.45
9.458	0.45	0.45	0.46	0.46	0.46	0.47	0.47
9.515	0.47	0.48	0.49	0.50	0.51	0.52	0.54
9.572	0.56	0.58	0.59	0.61	0.63	0.64	0.66
9.629	0.68	0.70	0.73	0.76	0.79	0.83	0.86
9.686	0.90	0.93	0.97	1.00	1.03	1.07	1.10
9.743	1.15	1.20	1.26	1.33	1.39	1.46	1.52
9.800	1.58	1.64	1.70	1.76	1.83	1.92	2.02
9.857	2.14	2.27	2.40	2.53	2.66	2.78	2.89
9.914	2.99	3.07	3.12	3.15	3.15	3.13	3.10
9.971	3.05	3.00	2.94	2.89	2.83	2.78	2.71
10.028	2.65	2.57	2.48	2.36	2.24	2.10	1.96
10.086	1.83	1.70	1.58	1.47	1.37	1.28	1.21

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
10.143	1.15	1.10	1.06	1.01	0.98	0.95	0.92
10.200	0.89	0.87	0.85	0.84	0.82	0.81	0.79
10.257	0.78	0.77	0.76	0.75	0.73	0.73	0.72
10.314	0.71	0.70	0.69	0.69	0.68	0.67	0.66
10.371	0.65	0.65	0.64	0.63	0.62	0.62	0.61
10.428	0.60	0.60	0.59	0.58	0.58	0.57	0.56
10.485	0.55	0.54	0.54	0.53	0.53	0.52	0.51
10.542	0.51	0.50	0.50	0.49	0.49	0.48	0.48
10.599	0.47	0.47	0.46	0.46	0.46	0.45	0.45
10.656	0.45	0.44	0.44	0.44	0.44	0.43	0.43
10.713	0.43	0.43	0.43	0.42	0.42	0.42	0.42
10.770	0.42	0.41	0.41	0.41	0.41	0.41	0.41
10.827	0.40	0.40	0.40	0.40	0.40	0.40	0.39
10.884	0.39	0.39	0.39	0.39	0.38	0.38	0.38
10.941	0.38	0.38	0.38	0.37	0.37	0.37	0.37
10.998	0.37	0.36	0.36	0.36	0.36	0.36	0.36
11.055	0.36	0.36	0.35	0.35	0.35	0.35	0.35
11.112	0.35	0.35	0.35	0.34	0.34	0.34	0.34
11.169	0.34	0.34	0.34	0.34	0.34	0.34	0.34
11.226	0.34	0.34	0.33	0.33	0.33	0.33	0.33
11.283	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.340	0.33	0.33	0.33	0.32	0.32	0.32	0.32
11.397	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.454	0.32	0.32	0.32	0.32	0.32	0.31	0.31

WinTR-20: Version 1.10
ed Brea Plaza Redevelop.
Proposed

0 0 0.05 (continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

11.511	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.568	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.625	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.682	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.739	0.30	0.30	0.29	0.29	0.29	0.29	0.29
11.796	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.853	0.29	0.29	0.29	0.29	0.28	0.28	0.28
11.911	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.968	0.28	0.28	0.28	0.28	0.28	0.27	0.27
12.025	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.082	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.139	0.27	0.27	0.27	0.26	0.26	0.26	0.26
12.196	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.253	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.310	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.367	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.424	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.481	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.538	0.25	0.25	0.25	0.25	0.24	0.24	0.24
12.595	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.652	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.709	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.766	0.24	0.23	0.23	0.23	0.23	0.23	0.23
12.823	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.880	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.937	0.23	0.23	0.23	0.23	0.23	0.22	0.22
12.994	0.22	0.22	0.22	0.22	0.22	0.22	0.22

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
13.051	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.108	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.165	0.22	0.21	0.21	0.21	0.21	0.21	0.21
13.222	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.279	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.336	0.21	0.21	0.21	0.21	0.21	0.20	0.20
13.393	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.450	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.507	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.564	0.20	0.19	0.19	0.19	0.19	0.19	0.19
13.621	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.679	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.736	0.19	0.19	0.19	0.19	0.19	0.18	0.18
13.793	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.850	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.907	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.964	0.18	0.17	0.17	0.17	0.17	0.17	0.17
14.021	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.078	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.135	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.192	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.249	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.306	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.363	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.420	0.17	0.17	0.17	0.17	0.17	0.16	0.16
14.477	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.534	0.16	0.16	0.16	0.16	0.16	0.16	0.16

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

14.591	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.648	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.705	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.762	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.819	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.876	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.933	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.990	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.047	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.104	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.161	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.218	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.275	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.332	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.389	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.446	0.16	0.16	0.16	0.16	0.16	0.15	0.15
15.504	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.561	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.618	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.675	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.732	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.789	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.846	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.903	0.15	0.15	0.15	0.15	0.15	0.15	0.15

Line
Start Time ---------- Flow Values @ time increment of 0.008 hr ----------

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
15.960	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.017	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.074	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.131	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.188	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.245	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.302	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.359	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.416	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.473	0.15	0.15	0.15	0.14	0.14	0.14	0.14
16.530	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.587	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.644	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.701	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.758	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.815	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.872	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.929	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.986	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.043	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.100	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.157	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.214	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.271	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.329	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.386	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.443	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.500	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.557	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.614	0.13	0.13	0.13	0.13	0.13	0.13	0.13

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

17.671	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.728	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.785	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.842	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.899	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.956	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.013	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.070	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.127	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.184	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.241	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.298	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.355	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.412	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.469	0.13	0.13	0.13	0.12	0.12	0.12	0.12
18.526	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.583	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.640	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.697	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.754	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.811	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
18.868	0.12	0.12	0.12	0.12	0.12	0.12	0.12

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

18.925	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.982	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.039	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.097	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.154	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.211	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.268	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.325	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.382	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.439	0.12	0.12	0.12	0.12	0.12	0.11	0.11
19.496	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.553	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.610	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.667	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.724	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.781	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.838	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.895	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.952	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.009	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.066	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.123	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.180	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.237	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.294	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.351	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.408	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.465	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.522	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.579	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.636	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.693	0.10	0.10	0.10	0.10	0.10	0.10	0.10

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

20.750	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.807	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.864	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.922	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.979	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.036	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.093	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.150	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.207	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.264	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.321	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.378	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.435	0.10	0.09	0.09	0.09	0.09	0.09	0.09
21.492	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.549	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.606	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.663	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.720	0.09	0.09	0.09	0.09	0.09	0.09	0.09

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)						
21.777	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.834	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.891	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.948	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

22.005	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.062	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.119	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.176	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.233	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.290	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.347	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.404	0.09	0.08	0.08	0.08	0.08	0.08	0.08
22.461	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.518	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.575	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.632	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.689	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.747	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.804	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.861	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.918	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.975	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.032	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.089	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.146	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.203	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.260	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.317	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.374	0.08	0.07	0.07	0.07	0.07	0.07	0.07
23.431	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.488	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.545	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.602	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.659	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.716	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.773	0.07	0.07	0.07	0.07	0.07	0.07	0.07

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

23.830	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.887	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.944	0.07	0.07	0.07	0.07	0.07	0.07	0.07
24.001	0.07	0.07	0.07	0.07	0.06	0.06	0.06
24.058	0.05						

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
OUTLET	0.004		1.597		9.95	3.15	777.54

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
4.953	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.010	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.067	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.124	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.181	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5.238	0.05	0.05	0.06	0.06	0.06	0.06	0.06
5.295	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

5.352	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.409	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.466	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.523	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.580	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.637	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.694	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.751	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.808	0.06	0.06	0.06	0.06	0.06	0.06	0.06
5.865	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.922	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5.979	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.036	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.093	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.150	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6.207	0.07	0.07	0.07	0.07	0.07	0.07	0.08
6.264	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.321	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.378	0.08	0.08	0.08	0.08	0.08	0.08	0.08
6.435	0.08	0.08	0.08	0.08	0.08	0.08	0.09
6.493	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.550	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.607	0.09	0.09	0.09	0.09	0.09	0.09	0.09
6.664	0.09	0.09	0.09	0.10	0.10	0.10	0.10
6.721	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.778	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.835	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.892	0.10	0.11	0.11	0.11	0.11	0.11	0.11
6.949	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.006	0.11	0.11	0.11	0.11	0.11	0.11	0.11
7.063	0.11	0.11	0.11	0.11	0.11	0.12	0.12
7.120	0.12	0.12	0.12	0.12	0.12	0.12	0.12

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

7.177	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.234	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.291	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.348	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7.405	0.12	0.12	0.12	0.13	0.13	0.13	0.13
7.462	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.519	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.576	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.633	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.690	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.747	0.13	0.13	0.13	0.13	0.13	0.13	0.13
7.804	0.14	0.14	0.14	0.14	0.14	0.14	0.14

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)						
7.861	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.918	0.14	0.14	0.14	0.14	0.14	0.14	0.14
7.975	0.14	0.14	0.14	0.14	0.14	0.14	0.14
8.032	0.14	0.14	0.14	0.14	0.14	0.14	0.15
8.089	0.15	0.15	0.15	0.15	0.15	0.15	0.15
8.146	0.15	0.15	0.15	0.16	0.16	0.16	0.16
8.203	0.16	0.16	0.16	0.16	0.17	0.17	0.17
8.261	0.17	0.17	0.17	0.17	0.18	0.18	0.18
8.318	0.18	0.18	0.18	0.18	0.19	0.19	0.19
8.375	0.19	0.19	0.19	0.20	0.20	0.20	0.20

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

8.432	0.20	0.20	0.20	0.20	0.21	0.21	0.21
8.489	0.21	0.21	0.21	0.22	0.22	0.22	0.22
8.546	0.22	0.22	0.22	0.23	0.23	0.23	0.23
8.603	0.23	0.23	0.23	0.24	0.24	0.24	0.24
8.660	0.24	0.24	0.25	0.25	0.25	0.25	0.25
8.717	0.25	0.25	0.26	0.26	0.26	0.26	0.26
8.774	0.26	0.26	0.27	0.27	0.27	0.27	0.27
8.831	0.27	0.27	0.28	0.28	0.28	0.28	0.28
8.888	0.28	0.29	0.29	0.29	0.29	0.29	0.29
8.945	0.29	0.30	0.30	0.30	0.30	0.30	0.30
9.002	0.31	0.31	0.31	0.31	0.31	0.31	0.32
9.059	0.32	0.32	0.32	0.33	0.33	0.33	0.33
9.116	0.33	0.34	0.34	0.34	0.34	0.34	0.35
9.173	0.35	0.35	0.36	0.36	0.36	0.36	0.37
9.230	0.37	0.37	0.37	0.38	0.38	0.38	0.39
9.287	0.39	0.39	0.40	0.40	0.40	0.40	0.41
9.344	0.41	0.41	0.42	0.42	0.42	0.43	0.43
9.401	0.43	0.43	0.44	0.44	0.44	0.44	0.45
9.458	0.45	0.45	0.46	0.46	0.46	0.47	0.47
9.515	0.47	0.48	0.49	0.50	0.51	0.52	0.54
9.572	0.56	0.58	0.59	0.61	0.63	0.64	0.66
9.629	0.68	0.70	0.73	0.76	0.79	0.83	0.86
9.686	0.90	0.93	0.97	1.00	1.03	1.07	1.10
9.743	1.15	1.20	1.26	1.33	1.39	1.46	1.52
9.800	1.58	1.64	1.70	1.76	1.83	1.92	2.02
9.857	2.14	2.27	2.40	2.53	2.66	2.78	2.89
9.914	2.99	3.07	3.12	3.15	3.15	3.13	3.10
9.971	3.05	3.00	2.94	2.89	2.83	2.78	2.71
10.028	2.65	2.57	2.48	2.36	2.24	2.10	1.96
10.086	1.83	1.70	1.58	1.47	1.37	1.28	1.21
10.143	1.15	1.10	1.06	1.01	0.98	0.95	0.92
10.200	0.89	0.87	0.85	0.84	0.82	0.81	0.79

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

10.257	0.78	0.77	0.76	0.75	0.73	0.73	0.72
10.314	0.71	0.70	0.69	0.69	0.68	0.67	0.66
10.371	0.65	0.65	0.64	0.63	0.62	0.62	0.61
10.428	0.60	0.60	0.59	0.58	0.58	0.57	0.56
10.485	0.55	0.54	0.54	0.53	0.53	0.52	0.51
10.542	0.51	0.50	0.50	0.49	0.49	0.48	0.48
10.599	0.47	0.47	0.46	0.46	0.46	0.45	0.45
10.656	0.45	0.44	0.44	0.44	0.44	0.43	0.43
10.713	0.43	0.43	0.43	0.42	0.42	0.42	0.42

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
10.770	0.42	0.41	0.41	0.41	0.41	0.41	0.41
10.827	0.40	0.40	0.40	0.40	0.40	0.40	0.39
10.884	0.39	0.39	0.39	0.39	0.38	0.38	0.38
10.941	0.38	0.38	0.38	0.37	0.37	0.37	0.37
10.998	0.37	0.36	0.36	0.36	0.36	0.36	0.36
11.055	0.36	0.36	0.35	0.35	0.35	0.35	0.35
11.112	0.35	0.35	0.35	0.34	0.34	0.34	0.34
11.169	0.34	0.34	0.34	0.34	0.34	0.34	0.34
11.226	0.34	0.34	0.33	0.33	0.33	0.33	0.33
11.283	0.33	0.33	0.33	0.33	0.33	0.33	0.33
11.340	0.33	0.33	0.33	0.32	0.32	0.32	0.32
11.397	0.32	0.32	0.32	0.32	0.32	0.32	0.32
11.454	0.32	0.32	0.32	0.32	0.32	0.31	0.31

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

11.511	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.568	0.31	0.31	0.31	0.31	0.31	0.31	0.31
11.625	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.682	0.30	0.30	0.30	0.30	0.30	0.30	0.30
11.739	0.30	0.30	0.29	0.29	0.29	0.29	0.29
11.796	0.29	0.29	0.29	0.29	0.29	0.29	0.29
11.853	0.29	0.29	0.29	0.29	0.28	0.28	0.28
11.911	0.28	0.28	0.28	0.28	0.28	0.28	0.28
11.968	0.28	0.28	0.28	0.28	0.28	0.27	0.27
12.025	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.082	0.27	0.27	0.27	0.27	0.27	0.27	0.27
12.139	0.27	0.27	0.27	0.26	0.26	0.26	0.26
12.196	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.253	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.310	0.26	0.26	0.26	0.26	0.26	0.26	0.26
12.367	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.424	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.481	0.25	0.25	0.25	0.25	0.25	0.25	0.25
12.538	0.25	0.25	0.25	0.25	0.24	0.24	0.24
12.595	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.652	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.709	0.24	0.24	0.24	0.24	0.24	0.24	0.24
12.766	0.24	0.23	0.23	0.23	0.23	0.23	0.23
12.823	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.880	0.23	0.23	0.23	0.23	0.23	0.23	0.23
12.937	0.23	0.23	0.23	0.23	0.23	0.22	0.22
12.994	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.051	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.108	0.22	0.22	0.22	0.22	0.22	0.22	0.22
13.165	0.22	0.21	0.21	0.21	0.21	0.21	0.21
13.222	0.21	0.21	0.21	0.21	0.21	0.21	0.21
13.279	0.21	0.21	0.21	0.21	0.21	0.21	0.21

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

13.336	0.21	0.21	0.21	0.21	0.21	0.20	0.20
13.393	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.450	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.507	0.20	0.20	0.20	0.20	0.20	0.20	0.20
13.564	0.20	0.19	0.19	0.19	0.19	0.19	0.19
13.621	0.19	0.19	0.19	0.19	0.19	0.19	0.19

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
13.679	0.19	0.19	0.19	0.19	0.19	0.19	0.19
13.736	0.19	0.19	0.19	0.19	0.19	0.18	0.18
13.793	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.850	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.907	0.18	0.18	0.18	0.18	0.18	0.18	0.18
13.964	0.18	0.17	0.17	0.17	0.17	0.17	0.17
14.021	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.078	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.135	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.192	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.249	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.306	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.363	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.420	0.17	0.17	0.17	0.17	0.17	0.16	0.16
14.477	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.534	0.16	0.16	0.16	0.16	0.16	0.16	0.16

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

14.591	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.648	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.705	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.762	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.819	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.876	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.933	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.990	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.047	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.104	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.161	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.218	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.275	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.332	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.389	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.446	0.16	0.16	0.16	0.16	0.16	0.15	0.15
15.504	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.561	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.618	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.675	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.732	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.789	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.846	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.903	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.960	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.017	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.074	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.131	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.188	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.245	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.302	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.359	0.15	0.15	0.15	0.15	0.15	0.15	0.15

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

16.416	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.473	0.15	0.15	0.15	0.14	0.14	0.14	0.14
16.530	0.14	0.14	0.14	0.14	0.14	0.14	0.14

Updated Brea Plaza Redevelop.
Proposed

Line Start Time	Flow Values @ time increment of 0.008 hr						
(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
16.587	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.644	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.701	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.758	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.815	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.872	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.929	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.986	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.043	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.100	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.157	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.214	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.271	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.329	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.386	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.443	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.500	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.557	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.614	0.13	0.13	0.13	0.13	0.13	0.13	0.13

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

17.671	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.728	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.785	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.842	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.899	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.956	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.013	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.070	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.127	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.184	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.241	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.298	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.355	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.412	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.469	0.13	0.13	0.13	0.12	0.12	0.12	0.12
18.526	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.583	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.640	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.697	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.754	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.811	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.868	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.925	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.982	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.039	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.097	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.154	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.211	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.268	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.325	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.382	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.439	0.12	0.12	0.12	0.12	0.12	0.11	0.11

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop.
Proposed
(continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
19.496	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.553	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.610	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.667	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.724	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.781	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.838	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.895	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.952	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.009	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.066	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.123	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.180	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.237	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.294	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.351	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.408	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.465	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.522	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.579	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.636	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.693	0.10	0.10	0.10	0.10	0.10	0.10	0.10

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop.
Proposed
(continued)

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

20.750	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.807	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.864	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.922	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.979	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.036	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.093	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.150	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.207	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.264	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.321	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.378	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.435	0.10	0.09	0.09	0.09	0.09	0.09	0.09
21.492	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.549	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.606	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.663	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.720	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.777	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.834	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.891	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.948	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.005	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.062	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.119	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.176	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.233	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.290	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.347	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:
Updated Brea Plaza Redevelop.
Proposed

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
22.404	0.09	0.08	0.08	0.08	0.08	0.08	0.08
22.461	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.518	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.575	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.632	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.689	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.747	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.804	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.861	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.918	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22.975	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.032	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.089	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.146	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.203	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.260	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.317	0.08	0.08	0.08	0.08	0.08	0.08	0.08
23.374	0.08	0.07	0.07	0.07	0.07	0.07	0.07
23.431	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.488	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.545	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.602	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.659	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.716	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.773	0.07	0.07	0.07	0.07	0.07	0.07	0.07

WinTR-20: Version 1.10 0 0 0.05
ed Brea Plaza Redevelop. (continued)
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

23.830	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.887	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.944	0.07	0.07	0.07	0.07	0.07	0.07	0.07
24.001	0.07	0.07	0.07	0.07	0.06	0.06	0.06
24.058	0.05						

Updated Brea Plaza Redevelop.
Proposed

WinTR-20: Version 1.10 0 0 0.05 (continued)
ed Brea Plaza Redevelop.
Proposed

STORM 2-Yr

SUB-AREA:
Total AreaOutlet .00405 96. .129

STREAM REACH:

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
Total Area	0.004		3.15				
OUTLET	0.004		3.15				

WinTR-20: Version 1.10
ed Brea Plaza Redevelop.
Proposed

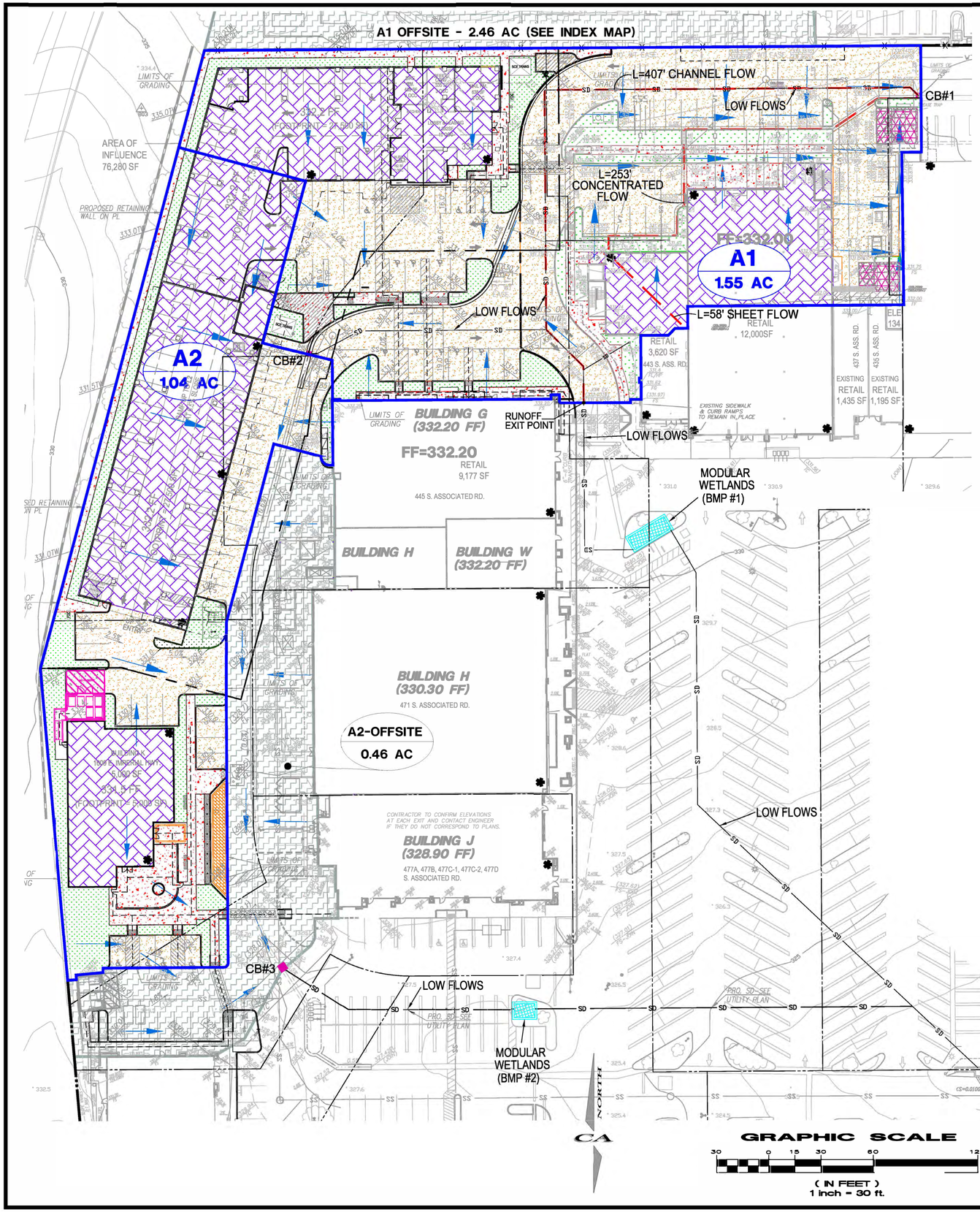
	0	0	0.05

(continued)

STORM 2-Yr

SUB-AREA:			
Total AreaOutlet	.00405	96.	.129

STREAM REACH:



WATER QUALITY CALCULATIONS
AREA 1 + OFFSITE : MODULAR WETLANDS UNIT SIZING

AREA 1 – 67,415 SF / 1.55 AC (89.3% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.893 + 0.15 = 0.82
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 1.55 AC
DESIGN FLOWRATE (Qd) = 0.82 * 0.26in/hr * 1.55 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.333 cfs

OFF-SITE

AREA – 107,253 SF / 2.46 AC (71.9% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.719 + 0.15 = 0.69
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 2.46 AC
OFFSITE DESIGN FLOWRATE (Qd)
= 0.69 * 0.26in/hr * 2.46 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.445 cfs

TOTAL TO BE TREATED: 0.333 + 0.445 = 0.778

MODULAR WETLANDS SELECTED SIZING : MWS-L-8-24-7'-8"-V-HC (8' x 24' BOX)
HIGH CAPACITY MODEL – 3.90
TREATMENT FLOW RATE (Qf) = 0.786 cfs
TREATMENT FLOW RATE (Qf) > DESIGN FLOWRATE (Qd)
0.786 cfs > 0.778 cfs

WATER QUALITY CALCULATIONS
AREA 2 + OFFSITE : MODULAR WETLANDS UNIT SIZING

AREA 2 – 45,402 SF / 1.04 AC (84.8% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.848 + 0.15 = 0.79
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 1.04 AC
DESIGN FLOWRATE (Qd) = 0.79 * 0.26in/hr * 1.04 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.215 cfs

OFF-SITE

AREA – 20,111 SF / 0.46 AC (95.0% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.950 + 0.15 = 0.86
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 0.46 AC
OFFSITE DESIGN FLOWRATE (Qd)
= 0.86 * 0.26in/hr * 0.46 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.104 cfs

TOTAL TO BE TREATED: 0.215 + 0.104 = 0.319

MODULAR WETLANDS SELECTED SIZING : MWS-L-8-12 (8' x 12' BOX)
STANDARD HEIGHT MODEL – 3.40
TREATMENT FLOW RATE (Qf) = 0.346 cfs
TREATMENT FLOW RATE (Qf) > DESIGN FLOWRATE (Qd)
0.346 cfs > 0.319 cfs

BMP LOCATIONS

BMP#1 – MWS (LAT: 33.912314° / LONG: –117.881847°)
BMP#2 – MWS (LAT: 33.911558° / LONG: –117.882055°)
CB#1 (LAT: 33.913010° / LONG: –117.881346°)
CB#2 (LAT: 33.912581° / LONG: –117.882471°)
CB#3 (LAT: 33.911630°/ LONG: –117.882522°)

CATCH BASIN FILTER MODEL NO.

CB#1,2, & 3 TO USE OLDCASTLE FILTER MODEL NO. FGP-24F

LEGEND: STRUCTURAL / TREATMENT BMPS

- LANDSCAPE AREA EFFICIENT IRRIGATION / LANDSCAPE AREA RUNOFF-MINIMIZING DESIGN
- MODULAR WETLANDS
- FLOW PATTERN
- DRAINAGE AREAS **A1**
- BUILDING PAD AREAS
- CONCRETE (DRIVEWAY/GUTTERS/SIDEWALKS)
- DRIVE AISLES
- CATCH BASINS W/ INSERT FILTERS & STENCIL SIGNAGE
- SD — STORM DRAIN
- FLOW PATH
- TRIBUTARY OFFSITE AREAS

PROJECT DATA:

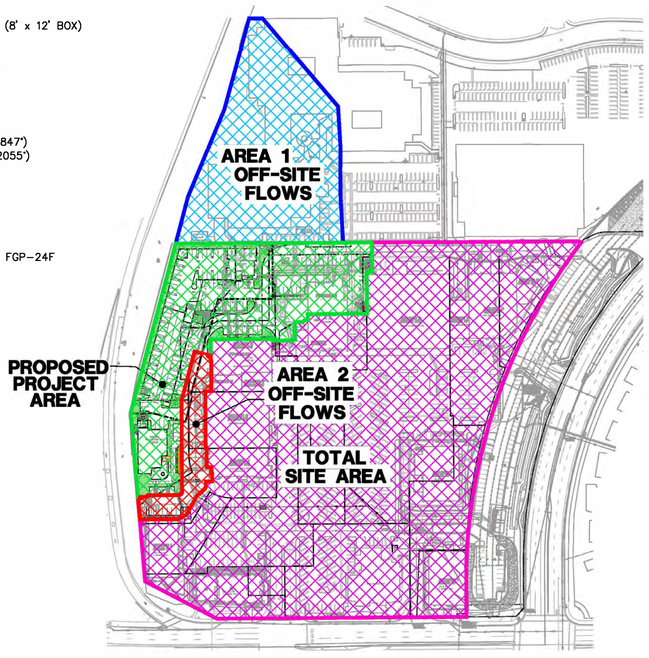
TOTAL SITE AREA: 13.7 AC
TOTAL PROPOSED AREA: 2.59 AC (112,817 SF)

BUILDING FOOTPRINT : 40,814 SF
DRIVE AISLES & LOADING AREA: 43,716 SF
CONCRETE HARDSCAPE/OTHER: 14,164 SF

14,123 SF LANDSCAPING
(12.5% PERVIOUS AREA)

CURRENT USE: COMMERCIAL
PROPOSED USE: COMMERCIAL/RESIDENTIAL

WATERSHED:
SAN GABRIEL-COYOTE CREEK WATERSHED



INDEX MAP

SCALE: 1"=150'

CERTIFICATION NOTE:

SELF-CERTIFICATION FROM A STATE LICENSED PROFESSIONAL ENGINEER OR THIRD-PARTY CERTIFICATIONS ARE REQUIRED OF ALL BMP'S CONSTRUCTED ON THIS PLAN AND ALL BMP'S SHALL BE CLEANED AND IN WORKING CONDITION AS PRESCRIBED BY THE MANUFACTURER TO OBTAIN CERTIFICATE OF OCCUPANCY FROM THE CITY OF BREA.

C3

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PREPARED BY:
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Planning • Engineering • Surveying
4101 BIRCH STREET
NEWPORT BEACH, CA 92660
949-724-9480 949-724-9484 FAX

OWNER:
BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
CONTACT: WAAD J. NADHIR
TELEPHONE: (248) 792-5071

WATER QUALITY MANAGEMENT PLAN
BMP EXHIBIT (SITE PLAN)
BREA PLAZA
1639 E. IMPERIAL HIGHWAY, BREA, CA

SHEET 1 OF 1

APPENDIX M

APPROVED WATER QUALITY MANAGEMENT PLAN FOR BREA PLAZA, DATED JANUARY 17, 2011

(STAMPED COVER PAGE ONLY)

2008-01230-01

Water Quality Management Plan

(WQMP)

for

RECEIVED
FEB 08 2011
COUNTY PROPERTY PERMITS

BREA PLAZA

Phases 1 & 2

PARCEL MAP BOOK 105/17-19

NORTHWEST CORNER OF IMPERIAL HIGHWAY AND ASSOCIATED ROAD, CITY OF BREA, COUNTY OF ORANGE, CALIFORNIA

CITY OF BREA
PUBLIC WORKS DEPT.
WQMP
APPROVED
RE-SUBMIT
SIGNATURE
2/3/11

Prepared for

BOSC EQUITIES
413 S. Associated Road
Brea, CA 92821
(714) 990-5715

Prepared by

Pardue, Cornwell & Associates, Inc.
18551 Von Karman Avenue, Suite 140
Irvine, CA 92612
(949) 724-9480

Prepared: January 11, 2010
Revised: January 18, 2010
Amended: January 17, 2011

APPENDIX N

WATER QUALITY CONDITIONS OF APPROVAL

(TO BE INCLUDED IN FINAL WQMP)

APPENDIX O

BMP MAINTENANCE SELF-CERTIFICATION FORM FOR THE CITY OF BREA

BMP Maintenance Self-Certification Form for the City of Brea

In addition to routine annual inspections conducted by the City for proper maintenance of post-construction stormwater control measures or Best Management Practices (BMPs) on the property, the City of Brea requires that the party responsible for maintenance of these BMPs receive proper orientation and training on their operations and maintenance. This form is to be completed by the owner representative and shall be made available to the City Authorized Inspector upon request. Should the maintenance provider or facility maintenance representative change at any time, the owner representative shall complete this form with the new responsible party for BMP maintenance.

Property Information	BMP O&M
Project Name: Updated Brea Plaza Redevelopment Project	**Responsible Party:** (Owner, management company or HOA/POA)
Legal Owner of Record: BPI Brea LLC	**Contact Name:**
Address: 417 S. Associated Road, Suite 313 Brea, CA 92821	**Address:**
Telephone: 248-792-5071	**Telephone:**
Email: wnadhir@bosc.com	**Email:**

As the party responsible for operation and maintenance of the BMPs specified in the approved Water Quality Management Plan (WQMP) for the subject property, I hereby certify under penalty of law that I, or persons under my supervision, are qualified and competent to carry out the inspection and maintenance the BMPs in a manner consistent with the approved WQMP Operation and Maintenance (O&M) Plan.

_____ _____

Maintenance Representative Signature Date

As the owner representative of the **Updated Brea Plaza Redevelopment Project** for which a Water Quality Management Plan (WQMP) was approved by the City, I hereby certify under penalty of law that all BMPs contained within the approved Project WQMP have been maintained and inspected in accordance with the schedule and frequency outlined in the approved WQMP Operation and Maintenance (O&M) Plan. The maintenance activities and

inspections conducted have been performed by qualified and knowledgeable individuals listed above. To the best of my knowledge, the information submitted is true and accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and citations for violating water quality regulations.

Owner/Representative Signature	Date

APPENDIX P

CITY OF BREA PROJECT SPECIFIC WQMP SUMMARY REPORT AND PROJECT WQMP SUMMARY EXHIBIT

City of Brea

Project Specific WQMP Summary Report

INSTRUCTIONS: Project applicant, please fill out and check all that apply.

Project Name: **Updated Brea Plaza Redevelopment Project**	Project Address: **1639 E. Imperial Highway** **Brea, CA 92821**
WQMP Application Number (BLD #): **PLN-2022-00078 & PLN-2024-00017**	APN(s): **319-391-01**
Watershed: **San Gabriel-Coyote Creek Watershed**	Project Size (Acres): **2.59**
New Development or Redevelopment: **Redevelopment**	Design Capture Volume (ft^3): **13,673 (includes run-on from off-site areas that commingles with project runoff)** **Flow Based BMPs – Design Flowrates = 0.778 cfs and 0.319 cfs (includes off-site flows)**
Land Use Type (check one): ☐ Industrial (SIC Code):_____ ☒ Commercial (SIC Code): **5999 & 5812** ☒ Mixed Use ☒ Residential ☐ Municipal (i.e. CIP) ☐ Other (specify): _____	Total BMP Treatment Capacity (ft^3): **Flow Based BMPs – Treatment Flowrates = 0.786 cfs and 0.346 cfs**
	Hydromodification (Yes/No): **No**
	Owner/Company Name: **BPI Brea LLC**
	Owner Address: **417 S. Associated Road, Suite 313** **Brea, CA 92821**
	Contact Name: **Waad J. Nadhir**
	Contact Phone: **248-792-5071**
	HOA/POA (Yes/No): **No**

STRUCTURAL BMP SUMMARY TABLE

Provide an itemized list of each LID and FCS BMP for each proposed project DMA. Expand this table as needed.

LID BMP Description (i.e. HSC-1, BIO-2, include manufacturer and model number if possible)	**DMA ID** (as noted on BMP Plot Plan)	**DMA Acres**	**DCV** (indicate units)	**BMP Treatment Capacity** (indicate units)	**BMP GPS Coordinates**
1. BIO-7 / Bio Clean Modular Wetlands System Unit (MWS-L-8-24-7′-8″-V-HC Model)	A1	1.55 acres (project area) plus 2.46 acres of off-site area sheet flowing to project area) = 4.01 acres	Flow Based BMP – Design Flowrate = 0.778 cfs	Flow Based BMP – Treatment Flowrate = 0.786 cfs	Lat 33.912314º / Long -117.881847º
1. BIO-7 / Bio Clean Modular Wetlands System Unit (MWS-L-8-12-Standard Height Model)	A2	1.04 acres (project area) plus 0.46 acres of adjacent off-site area) = 1.50 acres	Flow Based BMP – Design Flowrate = 0.319 cfs	Flow Based BMP – Treatment Flowrate = 0.346 cfs	Lat 33.911558º / Long -117.882055º
	TOTAL	**5.51 acres**	**0.778 cfs & 0.319 cfs**	**0.786 cfs & 0.346 cfs**	
	Does BMP Capacity Exceed DCV (Y/N)?		**Y**		

FCS Description	**DMA ID**	**Location Description**	**FCS GPS Coordinates**
1. Bio Clean Modular Wetlands System Unit (MWS-L-8-24-7′-8″-V-HC Model)	A1	MWS unit includes an FCS BMP. The MWS unit is located just south of Building E.	Lat 33.912314º / Long -117.881847º

2. BIO-7 / Bio Clean Modular Wetlands System Unit (MWS-L-8-12-Standard Height Model)	A2	MWS unit includes an FCS BMP. The MWS unit is located just south of Building J.	Lat 33.911558º / Long -117.882055º
3. FloGard +PLUS Catch Basin Insert Filter (CB #1)	A1	Grated inlet near NE corner of project area	Lat 33.913010º / Long -117.881346º
4. FloGard +PLUS Catch Basin Insert Filter (CB #2)	A1	Grated inlet near center of project area	Lat 33.912581º / Long -117.882471º
5. FloGard +PLUS Catch Basin Insert Filter (CB #3)	A2	Grated inlet just outside SE corner of project area	Lat 33.911630º / Long -117.882522º

Non-Structural Source Control BMP's (check all that apply):

- ☒ N1 Owner, Tenant, Occupant Education
- ☒ N2 Activity Restrictions
- ☒ N3 Common Area Landscape Mgmt
- ☒ N4 BMP Maintenance
- ☐ N5 Title 22 CCR Compliance
- ☐ N6 Local Water Quality Permit
- ☐ N7 Spill Contingency Plan
- ☐ N8 Underground Storage Tank
- ☐ N9 Hazardous Materials Disclosure
- ☐ N10 Uniform Fire Code
- ☒ N11 Common Area Litter Control
- ☒ N12 Employee Training
- ☐ N13 Loading Dock Good Housekeeping
- ☒ N14 Common Area Catch Basin Inspection
- ☒ N15 Street Sweeping Private Streets & Parking Lots
- ☐ N16 Retail Gasoline Outlets

Structural Source Control BMP's (check all that apply):

☒	S1 Storm Drain System Stenciling/Signage	☐	S8 Vehicle Wash Areas
☐	S2 Outdoor Material Storage Areas	☐	S9 Outdoor Process Areas
☒	S3 Trash Storage Areas	☐	S10 Equipment Wash Areas
☒	S4 Efficient Irrigation Systems & Landscape Design	☐	S11 Fueling Areas
☐	S5 Protect Slopes & Channels	☐	S12 Hillside Landscaping
☐	S6 Loading Dock Areas	☒	S13 Wash Water Controls for Food Prep Areas
☐	S7 Maintenance Bays	☐	S14 Community Car Wash Racks

Project WQMP Summary Exhibit

This WQMP Summary Exhibit ("Summary Exhibit") is to ensure there is a consistent and clarified exhibit included as part of the WQMP submittal process. The purpose of this Summary Exhibit is for it to be used by City inspectors to verify that post-construction structural BMPs are implemented correctly at the project site and as described in the approved WQMP. Though similar, the required elements of this Summary Exhibit are separate from the WQMP Plot Plan that is otherwise found in the WQMP report, as it should only include information relevant to the understanding of stormwater BMP operations and maintenance (i.e. no construction notes) and minimize use of topo lines, elevation callouts, etc. The Summary Exhibit shall include the following elements:

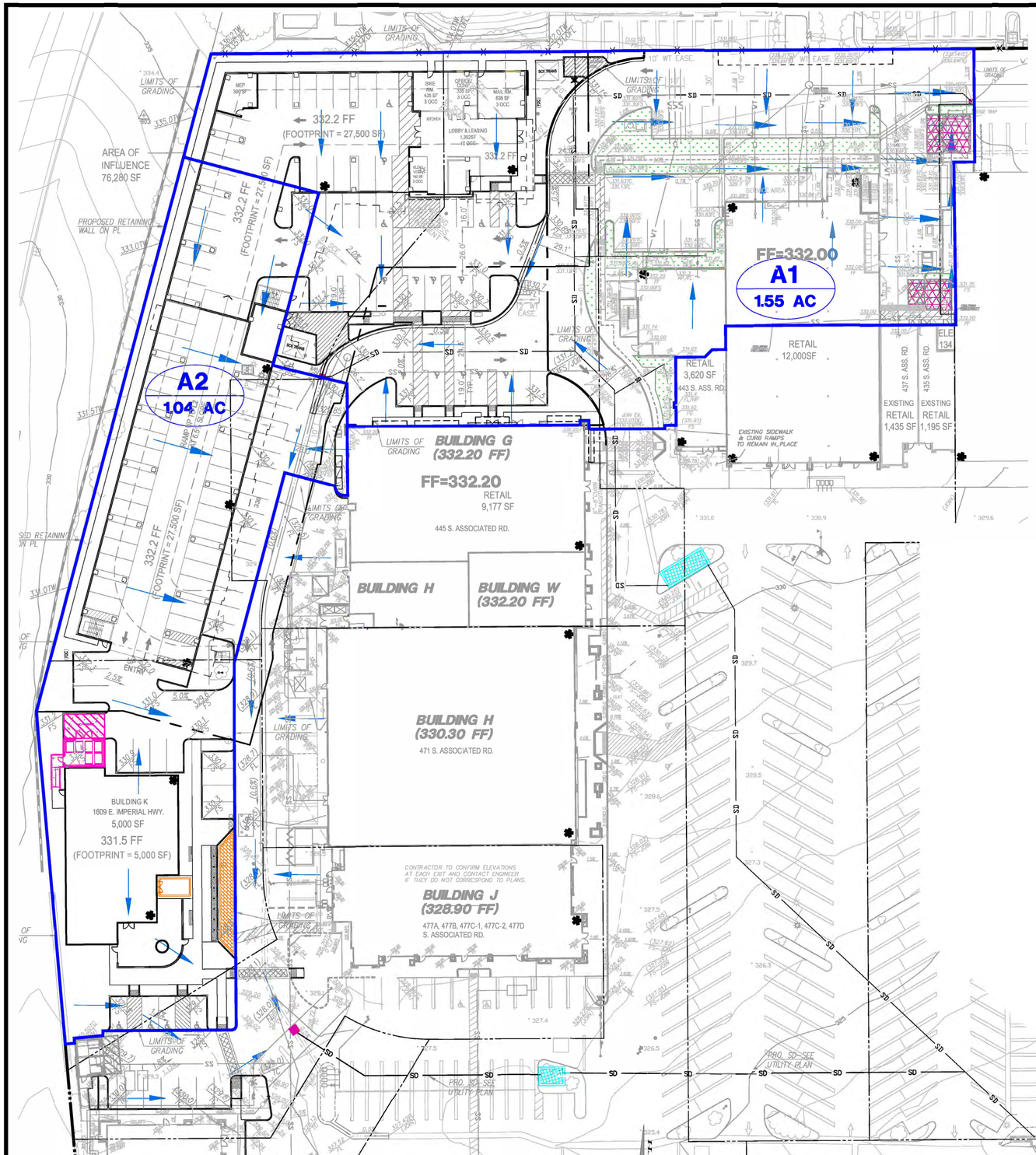
- Drainage Management Areas (DMAs) and flow information (i.e. surface flow arrows and pipe flow arrows),
- BMPs (LID and Structural Source Control – i.e. trash enclosures, catch basin stenciling),
- FCS – Full Capture Systems for trash TMDLs,
- Other structural water quality devices (i.e. roof downspout filters),
- All connections between on-site stormwater structures and off-site storm drains,

- And list of structural BMP ID (CASQA-appropriate).

Where applicable, the applicant shall input concise BMP sizing information in tabular form in the Summary Exhibit. This BMP sizing information should include:

- DMA ID,
- BMP ID (i.e. MWS #1, CDS #1, INF #1) and TGD BMP ID (i.e. BIO-1, BIO-7, INF-1, HSC-2),
- BMP description (i.e. dimensions, model number),
- And BMP location coordinates.

Color can be used to highlight the information above but should not be used for other plan details. Details unrelated to stormwater should be turned off/screened back/de-emphasized where possible. If using a hatch for pavement or landscaping, ensure it is also screened back and not distracting from BMPs.



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

LEGEND

- FLOW PATTERN
- DRAINAGE AREAS **A1**
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- MODULAR WETLANDS
- ROOFED TRASH ENCLOSURE*
- PROPRIETARY CATCH BASINS INSERT FILTERS WITH STENCILING **
- ROOF DOWN SPOUT

BMP SUMMARY

DMA ID	BMP ID	TGD BMP ID	BMP DESCRIPTION	BMP LOCATION
A1	MWS #1	BIO-7	MWS-L-8-24-V HIGH CAPACITY MODEL 3.95 (9' X 25')	LAT: 33.912314* LONG: -117.881847*
A2	MWS #2	BIO-7	MWS-L-8-12- STANDARD HEIGHT MODEL 3.40 (9' X 13')	LAT: 33.911558* LONG: -117.882055*

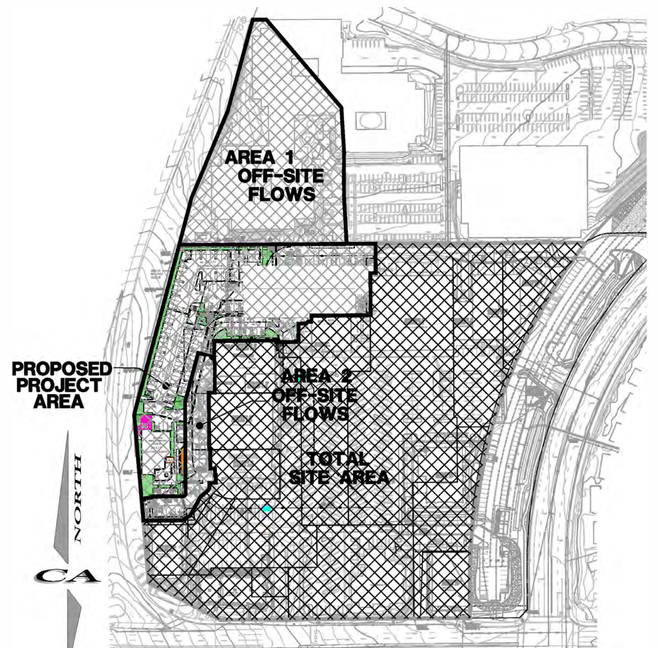
CATCH BASIN FILTER MODEL NO.

CB#1, 2, & 3 TO USE OLDCASTLE FILTER MODEL NO. FGP-24F

STRUCTURAL SOURCE CONTROL BMPS

S1 – STORM DRAIN STENCILING & SIGNAGE (CASQA SD-13)
S3 – TRASH ENCLOSURE DESIGN TO REDUCE POLLUTION (CASQA SD-32)
S4 – EFFICIENT IRRIGATION SYSTEMS (CASQA SD-12)
** – PROPOSED CATCH BASIN STENCIL

NO DUMPING · THIS DRAINS TO OCEAN ·



INDEX MAP

SCALE: 1"=150'

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949-724-9480 949-724-9484 FAX

OWNER:

BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
CONTACT: WAAD J. NADHIR
TELEPHONE: (248) 792-5071

WATER QUALITY MANAGEMENT PLAN
SUMMARY EXHIBIT
BREA PLAZA
1639 E. IMPERIAL HIGHWAY, BREA, CA

SHEET 1 OF 1

APPENDIX Q

WQMP-RELATED CORRESPONDENCE

Water Quality Management Plan (WQMP) Checklist

The purpose of this checklist is to provide a format for uniform, comprehensive, and well-documented reviews of WQMPs submitted by project applicants. The completed checklist should be transmitted to the project applicant with the project WQMP. A copy of the completed checklist should be retained with the project planning/permitting file. Upon acceptance of the project's Final WQMP, the property owner shall record a "Covenant and Agreement" with the County-Clerk Recorder or other instrument acceptable to the City to inform future property owners of the requirement to implement the approved project-specific WQMP. The recordation must be incorporated into the WQMP as an attachment prior to final approval.

WQMP (select one): ☒ Preliminary ☐ Final

City Planning Project Number: PLN-2024-00017

Project Name: Updated Brea Plaza Redevelopment Project

Project Address: 1639 E Imperial Highway

Name/Email of Plan Checker: Serena Ausili / sausili@fuscoe.com

First Review	WQMP Received On:	1/21/2025
	Review Completed On:	1/29/2025
Second Review	WQMP Received On:	
	Review Completed On:	
Third Review	WQMP Received On:	
	Review Completed On:	

REQUIRED FOR ALL SUBMITTALS AND RESUBMITTALS:
Submit an electronic copy to building@cityofbrea.gov.
Electronic submittals must be original-quality PDFs submitted as an attachment (Max 10MB) or through a file transfer service. *Scans of hard copies will not be accepted*.

FINAL APPROVAL PROCESS, submitted to City Hall At 1 Civic Center Circle, Brea CA 92821, attention Brian Ingallinera, Environmental Services or electronic documentation - sent via file transfer service to briani@cityofbrea.gov AS PRESCRIBED BELOW:

- One hard bound copy of approved WQMP that contains tabs/labels for each section
- Electronic submittals (PDF format) of the following documents:
    - Fully approved WQMP
    - Exhibit & Details of BMPs
    - City of Brea-Specific WQMP Summary Report
    - Section V Inspection & Maintenance

Prior to the field verification process from Environmental Services to obtain any form of occupancy the following items must be submitted/completed:

- Electronic copies (PDF format) of the Self-Certification from the State Licensed Professional Engineer that prepared the WQMP or Third-Party Certifications are required of all BMPs are constructed per the approved plan and in working condition as prescribed by the manufacturer- sent via file transfer service to briani@cityofbrea.gov
- All BMPs are accessible to conduct visual inspection and take photos
- All BMPs are clean and in working condition as prescribed by the manufacturer

Prior to sign off from Environmental Services to obtain the final Certificate of Occupancy the following items must be completed:

- Electronic copy (PDF format) of the recorded documents - sent via file transfer service to briani@cityofbrea.gov
    - Title Page
    - Signed Owner's Certification Page
    - Signed Engineer's Certification Page
    - The City of Brea-Specific WQMP Summary Report
    - Exhibit & Details of BMPs
    - Section V Inspection & Maintenance

One hard copy will be returned to the owner upon City-stamped approval. Grading Permit will be approved upon submittal of the hard copy WQMPs. An electronic copy (PDF) is also required.

Title, Owner's Certification and Table of Contents

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Title Page			
Project name	X		
City planning project number	X		
Tract number and lot number(s), if applicable	X		
Site address(es)	X		
Owner/Developer name, address, & phone number	X		
Consulting/Engineering firm name, address, & phone number	X		
Date WQMP was prepared/revised	X		
Certification			
Signed certification statement in which the project owner acknowledges and accepts the provisions of the WQMP (not required for a Preliminary WQMP)			X
Signed and stamped preparer (engineer) certification statement	X		
Table of Contents			
Table of contents, including a list of all figures and attachments	X		

Section I: Permit Numbers and Conditions of Approval

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Permit number(s)	X		
Address(es), lot & tract or parcel map number(s)	X		
Verbatim Water Quality Conditions, including condition requiring preparation of WQMP, if applicable			X
Conceptual WQMP permit number, if applicable			X
Provides applicable conditions from watershed-based plans including WIHMPs and TMDLs			X

Section II: Project Description

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
II. 1 Project Description			
Development category	X		
Quantity and percentage of pervious and impervious surface for pre-project and project conditions	X		
Description includes paved areas, including the type of parking areas, and landscaped areas	X		
For Commercial and Industrial Projects:			

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Standard Industrial Classification (SIC) Code which best describes the facilities operations	X		
Describes the type of use(s) for each building or tenant space	X		
Does project include food preparation, cooking, and eating areas (specify location and type of area) *Include*			
Describes delivery areas and loading docks (specify location and design and if below grade and types of materials expected to be stored			X
Describes outdoor materials storage areas (describe and depict location(s), specify type(s) of materials expected to be stored)			X
Describes activities that will be routinely conducted outdoors			X
Describes any activities associated with equipment or vehicle maintenance and repair, including washing or cleaning. Indicates number of service bays or number of fueling islands/fuel pumps, if applicable.			X
Residential Projects			
Range of lot and home sizes	X		
Describes all community facilities such as, laundry, car wash, swimming pools, jacuzzi, parks, open spaces, tot lots, etc. *Include*		X	
II. 2 Potential Stormwater Pollutants			
Identifies the potential stormwater or urban runoff pollutants reasonably expected to be associated with the project	X		
II.3 Hydrologic Conditions of Concern (HCOCs)			
Identifies potential HCOCs	X		
II.4 Post Development Drainage Characteristics			
Post development drainage characteristics	X		
II.5 Property Ownership/Management			
Describes ownership of all portions of project and site – Will any infrastructure transfer to public agencies (City, County, Caltrans, etc.)? – Will a homeowners or property owners association will be formed? – Will the association be involved in long term maintenance?	X		

Section III: Site Description

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
III. 1 Physical Setting			
Name of Planned Community/Planning Area, if applicable			X

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Site address(es)	X		
General land use designation	X		
Zoning	X		
Acreage to nearest tenth	X		
Soil type(s)	X		
III.2 Site Characteristics			
Precipitation Zone	X		
Topography	X		
Drainage patterns/connections	X		
Geology and infiltration properties	X		
Identifies all hydrologic (groundwater) conditions	X		
Utility and infrastructure information	X		
III.3 Watershed Description			
Downstream receiving waters	X		
Known water quality impairments as included in the 303(d) List	X		
Total Maximum Daily Loads (TMDLs)	X		
Pollutants of concern	X		
Identifies known Environmentally Sensitive Areas (ESAs) and Areas of Special Biological Significance (ASBSs) within the vicinity and their proximity to the project			X

Section IV: Best Management Practices

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
IV.1 Project Performance Criteria			
Identifies Watershed Infiltration and Hydromodification Master Plan (WIHMP), if applicable			X
Performance criteria for hydromodification control, LID criteria, and treatment control BMPs, if applicable	X		
Calculated Design Capture Volume (DCV) for the project	X		
IV.2 Site Design and Drainage			
Narrative description of how site design concepts were considered and incorporated into project plans	X		
Table of Drainage Management Areas (DMAs) for the project and the calculated DCV for each DMA	X		
IV.3 LID BMP Selection and Project Conformance Analysis			
IV.3.1 Hydrologic Source Controls (HSCs)			
Narrative justification of HSCs being used and how retention requirements are met			X

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
IV.3.2 Infiltration BMPs			
Selection, suitability, and sizing information with calculations			X
If infiltration BMPs are infeasible to treat LID DCV: documentation of how much DCV can be met and why it is infeasible to meet the full volume with infiltration BMPs	X		
IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs			
Selection, suitability and sizing information with calculations			X
If Evapotranspiration/Harvesting BMPs are infeasible to treat LID DCV: documentation of how much DCV can be met and why it is infeasible to meet the full volume with evapotranspiration/harvest BMPs, infiltration BMPs, or a combination	X		
IV.3.4 Biotreatment BMPs			
Selection, suitability and sizing information with calculations	X		
If Biotreatment BMPs are infeasible to treat LID DCV: documentation of how much DCV can be met and why it is infeasible to meet the full volume with biotreatment BMPs, evapotranspiration/ harvest BMPs, infiltration BMPs, or a combination			X
IV3.5 Hydromodification Control BMPs			
Selection, suitability and sizing information with calculations			X
Description of appropriate LID and hydromodification BMPs and identification of design basis (volume or flowrate) for the LID BMPs			X
IV.3.6 Regional/Sub-Regional LID BMPs			
Regional/sub-regional BMPs that will be utilized			X
IV.3.7 Treatment Control BMPs			
Selection, suitability and sizing information with calculations	X		
Design basis for structural BMPs provided	X		
Do on-site BMPs include full capture certification or does a separate BMP address the full capture of trash (Connector Pipe Screen, Catch Basin Screen, or equivalent)? *Provide sizing calculations of the 1-yr, 1-hr storm event for each full capture BMP*		X	
IV.3.8 Non-structural Source Control BMPs			
Non-structural source control BMPs and valid explanations for those that are not used	X		
IV.3.9 Structural Source Control BMPs			

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Structural source control BMPs and valid explanations for those that are not used	X		
IV.4 Alternative Compliance Plan			
IV.4.1 Water Quality Credits			
Calculation of credits, if applicable			X
IV.4.2 Alternative Compliance Plan Information			
If LID BMPs do not fulfill LID and hydromodification requirements: description of alternative compliance measures (Treatment Control BMPs, regional programs, Urban Runoff Fund/Mitigation Program)			X

Section V: Inspection and Maintenance Responsibility for BMPs

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Entity (or entities) responsible for the long-term inspection and maintenance of all source control and structural BMPs, including name, title, company, address, and phone number	X		
Minimum frequency for inspection and maintenance to ensure the effectiveness of each source control and structural BMP	X		
Mechanism for the long-term operation and maintenance, including funding	X		

Section VI: Location Map and Plot Plan

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
At a minimum, 24" by 36" plot plan, with layout maximized for legibility and only includes information that pertains to the WQMP	X		
City assigned project number and site address(es) *Include City assigned project number*		X	
Legend	X		
North arrow and scale	X		
BMP Summary Table (including DMA ID, BMP ID, Area, Required Volume and/or Flowrate, Design Volume and/or Flowrate, BMP Model/Capacity, GPS coordinates in decimal degrees)	X		
Structural BMP ID labels (e.g., MWS #1, MWS #2, etc.)	X		
BMP details and cross sections	X		
Intended function of facilities clearly labeled	X		
Outdoor activity areas clearly labeled	X		

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Drainage flow information, including general surface flow lines, concrete or other surface ditches or channels, storm drain facilities such as catch basins and storm drain pipes	X		
Label for on-site drainage tie-in to the off-site drainage system	X		
Project grading plan provided and reviewed to confirm consistency with the WQMP	X		
The following self-certification statement is provided on the WQMP exhibit and Grading Plans: • Self-Certification from the State Licensed Professional Engineer that prepared the WQMP or Third-Party Certifications are required of all BMPs constructed on this plan in working condition as prescribed by the manufacturer to obtain any form of Certificate of Occupancy	X		

Section VII: Educational Materials

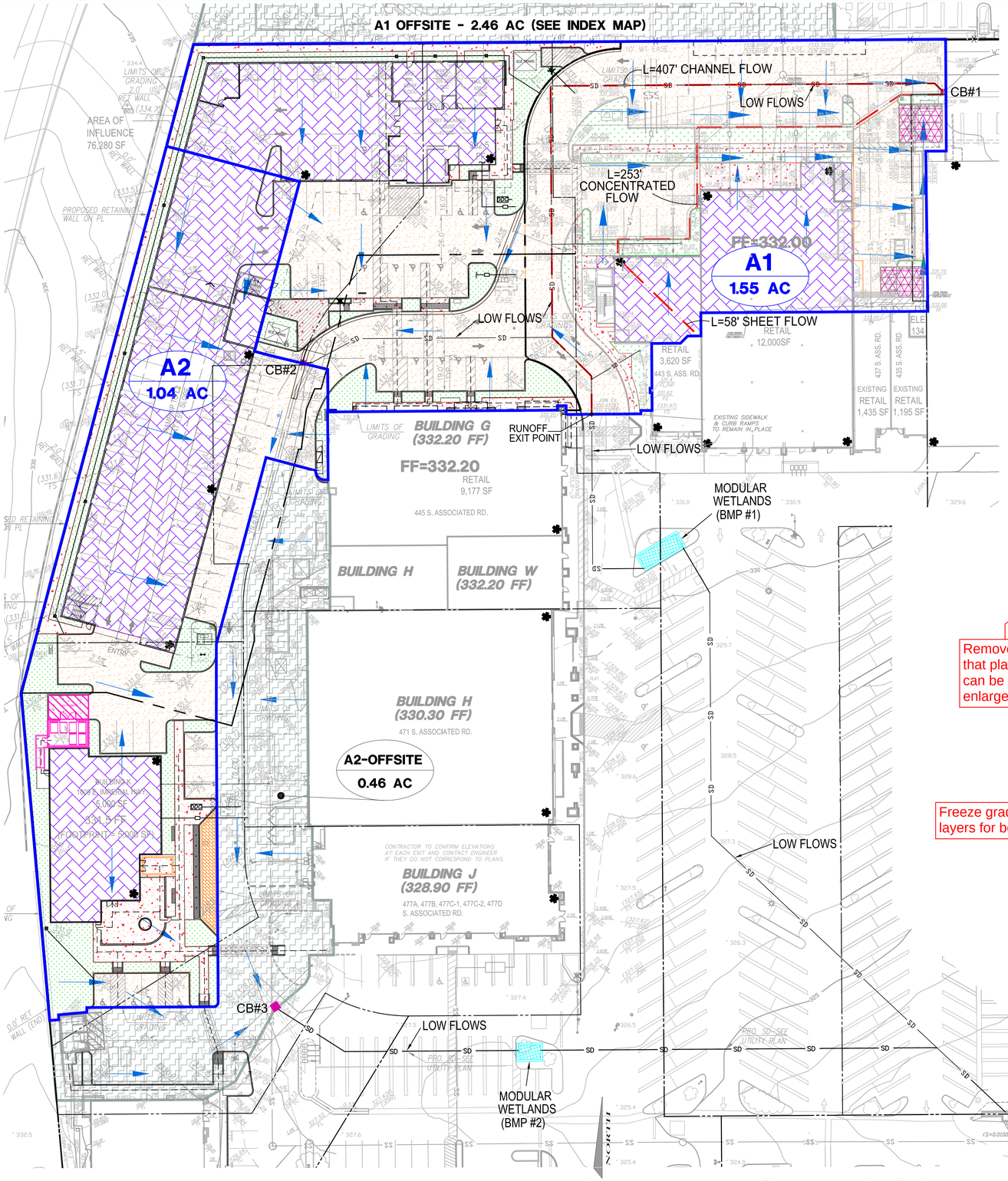
WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Identification of applicable educational materials that will be used by the project, including reference to Orange County Watershed websites where the brochures or BMP fact sheets can be found	X		

Attachments

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
City of Brea "Project Specific WQMP Summary Report"	X		
Attachment for County recordation of the WQMP (recordation of Title Page, Owner's Certification Page, Engineer's Certification Page, and City of Brea WQMP Summary Page must be recorded before approval can be issued)	X		
Attachment for WQMP-related correspondence (include any emails pertaining to the WQMP, previous plan check comments, or any specific instructions from plan checkers/City staff. For Final WQMP submittals, the stamped cover page of the approved Preliminary WQMP must be included in this Attachment)	X		
BMP Maintenance Self-Certification Form	X		
WQMP plan check checklists from previous rounds of reviews			X
Final Resolution of Approval, Conditional Use Permit, etc. is included as an Attachment to the WQMP			X

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
TGD Calculation Worksheets, as applicable			
Worksheet A: Hydrologic Source Control Calculation Form			X
Worksheet B: Simple Design Capture Volume Sizing Method	X		
Worksheet C: Capture Efficiency Method for Volume-Based, Constant Drawdown BMPs			X
Worksheet D: Capture Efficiency Method for Flow-Based BMPs *Provide*		X	
Worksheet H: Factor of Safety and Design Infiltration Rate			X
Worksheet I: Summary of Groundwater-related Feasibility Criteria			X
Worksheet J: Summary of Harvested Water Demand and Feasibility *Provide*		X	
Table 2.7: Infiltration BMP Feasibility Worksheet	X		
Education Materials	X		
O&M Plan	X		
Geotechnical Report, if applicable	X		

Additional Comments



WATER QUALITY CALCULATIONS
AREA 1 + OFFSITE : MODULAR WETLANDS UNIT SIZING

AREA 1 – 67,415 SF / 1.55 AC (89.3% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.893 + 0.15 = 0.82
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 1.55 AC
DESIGN FLOWRATE (Qd) = 0.82 * 0.26in/hr * 1.55 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.333 cfs

OFF-SITE

AREA – 107,253 SF / 2.46 AC (71.9% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.719 + 0.15 = 0.69
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 2.46 AC
OFFSITE DESIGN FLOWRATE (Qd)
= 0.69 * 0.26in/hr * 2.46 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.445 cfs

TOTAL TO BE TREATED: 0.333 + 0.445 = 0.778

MODULAR WETLANDS SELECTED SIZING : MWS-L-8-24-7'-8"-V-HC (8' x 24' BOX)
HIGH CAPACITY MODEL – 3.90
TREATMENT FLOW RATE (Qf) = 0.786 cfs
TREATMENT FLOW RATE (Qf) > DESIGN FLOWRATE (Qd)
0.786 cfs > 0.778 cfs

WATER QUALITY CALCULATIONS
AREA 2 + OFFSITE : MODULAR WETLANDS UNIT SIZING

AREA 2 – 45,402 SF / 1.04 AC (84.8% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.848 + 0.15 = 0.79
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 1.04 AC
DESIGN FLOWRATE (Qd) = 0.79 * 0.26in/hr * 1.04 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.215 cfs

OFF-SITE

AREA – 20,111 SF / 0.46 AC (95.0% IMPERVIOUS)
DESIGN FLOWRATE (Qd) = C * DI * DA * 43,560 / (12in/ft x 3600sec/hr)
RUNOFF COEFFICIENT (C) = 0.75 * Imp% + 0.15 = 0.75 * 0.950 + 0.15 = 0.86
DI = DESIGN INTENSITY (in/hr) = 0.26 in/hr
DA = DRAINAGE AREA: 0.46 AC
OFFSITE DESIGN FLOWRATE (Qd)
= 0.86 * 0.26in/hr * 0.46 AC * 43,560 / (12in/ft x 3600sec/hr)
= 0.104 cfs

TOTAL TO BE TREATED: 0.215 + 0.104 = 0.319

MODULAR WETLANDS SELECTED SIZING : MWS-L-8-12 (8' x 12' BOX)
STANDARD HEIGHT MODEL – 3.40
TREATMENT FLOW RATE (Qf) = 0.346 cfs
TREATMENT FLOW RATE (Qf) > DESIGN FLOWRATE (Qd)
0.346 cfs > 0.319 cfs

Remove so that plan view can be enlarged

BMP LOCATIONS

BMP#1 – MWS (LAT: 33.912314° / LONG: –117.881847°)
BMP#2 – MWS (LAT: 33.911558° / LONG: –117.882055°)
CB#1 (LAT: 33.913010° / LONG: –117.881346°)
CB#2 (LAT: 33.912581° / LONG: –117.882471°)
CB#3 (LAT: 33.911630°/ LONG: –117.882522°)

CATCH BASIN FILTER MODEL NO.

CB#1,2, & 3 TO USE OLDCASTLE FILTER MODEL NO. FGP-24F

Freeze grading annotation layers for better legibility.

LEGEND: STRUCTURAL / TREATMENT BMPS

- LANDSCAPE AREA EFFICIENT IRRIGATION / LANDSCAPE AREA RUNOFF-MINIMIZING DESIGN
- MODULAR WETLANDS
- FLOW PATTERN
- DRAINAGE AREAS **A1**
- BUILDING PAD AREAS
- CONCRETE (DRIVEWAY/GUTTERS/SIDEWALKS)
- DRIVE AISLES
- CATCH BASINS W/ INSERT FILTERS & STENCIL SIGNAGE
- SD — STORM DRAIN
- FLOW PATH
- TRIBUTARY OFFSITE AREAS

PROJECT DATA:

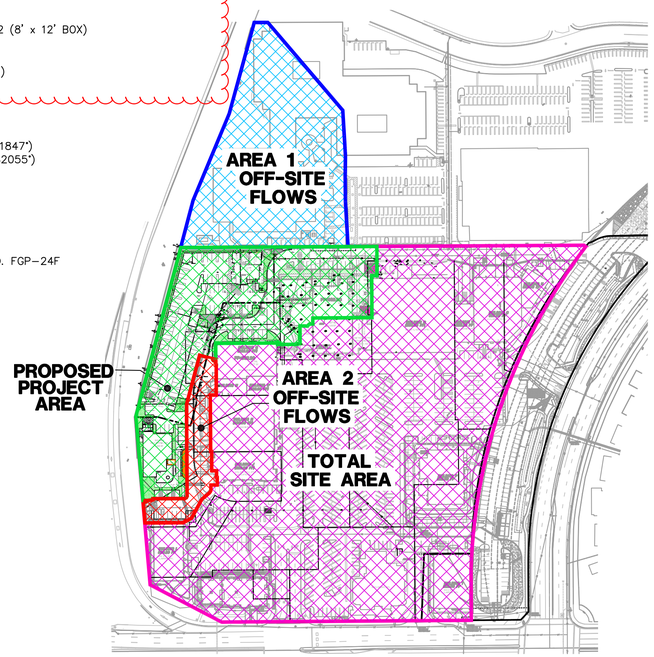
TOTAL SITE AREA: 13.7 AC
TOTAL PROPOSED AREA: 2.59 AC (112,817 SF)

BUILDING FOOTPRINT : 40,814 SF
DRIVE AISLES & LOADING AREA: 43,716 SF
CONCRETE HARDSCAPE/OTHER: 14,164 SF

14,123 SF LANDSCAPING
(12.5% PERVIOUS AREA)

CURRENT USE: COMMERCIAL
PROPOSED USE: COMMERCIAL/RESIDENTIAL

WATERSHED:
SAN GABRIEL-COYOTE CREEK WATERSHED



INDEX MAP

SCALE: 1"=150'

CERTIFICATION NOTE:

SELF-CERTIFICATION FROM A STATE LICENSED PROFESSIONAL ENGINEER OR THIRD-PARTY CERTIFICATIONS ARE REQUIRED OF ALL BMP'S CONSTRUCTED ON THIS PLAN AND ALL BMP'S SHALL BE CLEANED AND IN WORKING CONDITION AS PRESCRIBED BY THE MANUFACTURER TO OBTAIN CERTIFICATE OF OCCUPANCY FROM THE CITY OF BREA.

C4

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PREPARED BY:
CA ENGINEERING, INC.
Planning • Engineering • Surveying
4101 BIRCH STREET
NEWPORT BEACH, CA 92660
949-724-9480 949-724-9484 FAX

OWNER:
BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
CONTACT: WAAD J. NADHIR
TELEPHONE: (248) 792-5071

WATER QUALITY MANAGEMENT PLAN
BMP EXHIBIT (SITE PLAN)
BREA PLAZA
1639 E. IMPERIAL HIGHWAY, BREA, CA

SHEET 1
OF 1

\\CA-SVR1\Shared\487-5 BREA PLAZA #PARKING\15\WQMP\487-5 WQMP Site Plan.dwg Last Modified: 07 Jan 2025 – 6:14pm
Plotted on: 09 Jan 2025 – 21.94in by cwood

APPENDIX R

COUNTY RECORDED WQMP DOCUMENTS

FCS
An ADEC Innovation

Traffic Circulation Assessment

CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: April 25, 2023

TO: Waad Nadhir, BOSC Realty Advisors

FROM: Arthur Black, LSA

SUBJECT: Brea Plaza Shopping Center (Buildings E and G) Traffic and Vehicle Miles Traveled Analysis

Traffic Analysis

The *Brea Plaza Expansion Revised Traffic Circulation Analysis* (LLG, July 2021; Attachment A) prepared a level of service (LOS) analysis for a mixed-use development consisting of 21,355 square feet (sf) of office space, 189 apartment dwelling units, and a net increase of 291 parking spaces. That proposed project was estimated to generate 798 trips per weekday, of which 102 would occur in the a.m. peak hour and 72 would occur in the p.m. peak hour. However, accounting for a reduction in trips associated with the movie theater (which would be demolished) and internal trip capture at the remaining shopping center, the net additional trips associated with the project were -1,680 per weekday, 100 in the a.m. peak hour, and -60 in the p.m. peak hour.

Subsequent to the analysis presented in the *Brea Plaza Expansion Revised Traffic Circulation Analysis* (LLG, July 2021), the application for that project was withdrawn and a revised project is currently being proposed. Table A presents the revised project description. The revised project would demolish 21,460 sf (including the second story) of movie theater use and construct 23,307 sf of shopping center use.

Table A: Description of Revised Project

Building	Building SF/Land Use	Action
Building F	21,460 sf (1,100 seats)/Theater	Demolish
Building E	10,585 sf/Retail	Remains
	7,787 sf/Retail (1st Floor)	New
	7,040 sf/Office (2nd Floor)	New
Building G	9,177 sf/Retail	Remains
	8,480 sf/Office (2nd Floor)	New

sf = square feet

Table B presents the trip generation for the revised project. Table B applies the same methodology as the approved traffic study (i.e., trip generation for the movie theater is calculated based on the

Table B: Revised Project Trip Generation

Land Use	Size	Unit	ADT	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Trip Rates (Land Use Code)[1]									
Movie Theater (411)		Seat	1.76	0.00	0.00	0.00	0.04	0.04	0.08
Shopping Center > 150 TSF (820)		TSF	37.01	0.52	0.32	0.84	1.63	1.77	3.40
Project Trip Generation									
Movie Theater	(1,100)	Seat	(1,936)	0	0	0	(44)	(44)	(88)
Shopping Center	23.307	TSF	863	13	7	20	38	41	79
Net Vehicle Trip Generation			**(1,073)**	**13**	**7**	**20**	**(6)**	**(3)**	**(9)**

[1] Institute of Transportation Engineers *Trip Generation Manual,* 11th Edition (2021).

ADT = average daily trips TSF = thousand square feet

number of seats and for the shopping center is based on total square feet). As Table B shows, the revised project would generate fewer trips than existing uses in the p.m. peak hour and would result in 20 new trips in the a.m. peak hour. This level of trip generation is less than the 50-trip threshold for preparation of a traffic impact analysis.

Although the previously approved project was anticipated to result in a net reduction in trips, a traffic analysis was conducted in the *Brea Plaza Expansion Revised Traffic Circulation Analysis* (LLG, July 2021) including LOS assessment at nine intersections, queueing evaluation at the study intersections, and traffic signal warrant analysis at the Associated Road/Brea Plaza intersection. The nine intersections included in the study area are:

- State Route 57 (SR-57) Southbound Ramps/Imperial Highway
- SR-57 Northbound Ramps-Brea Plaza Driveway 1/Imperial Highway
- Associated Road/Birch Street
- Associated Road/Greenbriar Lane
- Associated Road/Imperial Highway
- Placentia Avenue-Castlegate Lane/Imperial Highway
- Associated Road/Brea Plaza Driveway 2
- Associated Road/Brea Plaza Driveway 3
- Brea Plaza Driveway 4/Imperial Highway

The LOS assessment concluded that the previously proposed project would not have a significant traffic impact at any of the study intersections. Both Intersection Capacity Utilization (ICU) and Highway Capacity Manual (HCM) methodologies were applied. Analysis scenarios included an interim future year (2024) with the addition of cumulative projects and the General Plan Buildout horizon (2045). In all scenarios with both methodologies, all study intersections were determined to operate at satisfactory LOS without and with the project with one exception. The Brea Plaza driveway on Imperial Highway (i.e., adjacent to Chick-fil-A) was found to operate at LOS E under

Cumulative No Project, General Plan Buildout No Project, and General Plan Buildout Plus Project conditions. At this study intersection, the public roadway (Imperial Highway) does not stop. The delay experienced at this intersection is limited to vehicles exiting the Brea Plaza. Increases in project traffic or ambient traffic at this location would not result in public vehicles experiencing an unsatisfactory LOS; only vehicles from the project site would experience any delay. Ultimately, the approved traffic study concluded that the previously proposed project would not have a significant impact because the project resulted in a net reduction in trips. The revised project also results in a net reduction in trips.

The queueing evaluation found that adequate storage would be provided for all movements at all study intersections in the interim future year (2024 with cumulative projects) and General Plan Buildout scenarios both without and with the project. The traffic signal warrant analysis concluded that the intersection is forecast to operate at a satisfactory LOS without a traffic signal, that traffic signal Warrant 3 is not satisfied, and that a traffic signal is not recommended.

The Cumulative No Project and General Plan Buildout No Project traffic conditions for the revised project are identical to the Cumulative No Project and General Plan Buildout No Project traffic conditions analyzed in the approved traffic study. Because the approved traffic study found no LOS or queueing inadequacies and did not recommend a new traffic signal in the No Project scenarios, these conclusions would be identical for the revised project. Similar to the previously proposed project, the revised project results in a net reduction in trips. Because the approved traffic study found that the previously proposed project would have no impact on traffic conditions, that conclusion would be the same for the revised project. Therefore, the revised project would not result in unsatisfactory LOS or inadequate queueing and would not require signalization of the Brea Plaza intersection on Associated Road.

Vehicle Miles Traveled Analysis

The *Revised Vehicle Miles Traveled (VMT) Screening Assessment for The Brea Plaza Expansion Project* (LLG, June 2021; Attachment B) prepared a VMT screening analysis for the previously proposed mixed-use development consisting of 21,355 sf of office space, 189 apartment dwelling units, and a net increase of 291 parking spaces. The screening assessment found that because the previously proposed project would result in a net reduction in daily trips, the project would generate fewer than 110 daily vehicle trips and would not require a VMT analysis in accordance with the City of Brea's Transportation Impact Analysis Guidelines.

Similarly, Table B shows that the revised project would result in a net reduction in daily trips. Therefore, the revised project is also exempt from additional VMT analysis in accordance with the City of Brea's Transportation Impact Analysis Guidelines. It should be noted that the project would result in fewer than 50,000 sf of commercial development, which would further qualify for screening.

Conclusion

The revised project at the Brea Plaza Shopping Center would demolish the 21,460 sf (1,100-seat) movie theater and construct a net new 23,307 sf of shopping center consisting of retail and office

space. Traffic conditions in the No Project scenarios analyzed in the previously approved traffic study would be identical for the No Project conditions of the revised project. Similar to the previously approved project, the revised project would result in a net reduction in trips. Because the previously approved traffic study found no traffic impacts for the previously proposed project, the revised project is also determined to not result in traffic impacts. Similarly, the conclusions of the previously approved VMT analysis also apply to the revised project, and the VMT impacts of the revised project would be less than significant.

Attachments: A: *Brea Plaza Expansion Revised Traffic Circulation Analysis* (LLG, July 2021)

B: *Revised Vehicle Miles Traveled (VMT) Screening Assessment for The Brea Plaza Expansion Project* (LLG, June 2021)

ATTACHMENT A

BREA PLAZA EXPANSION REVISED TRAFFIC CIRCULATION ANALYSIS (LLG, JULY 2021)

REVISED TRAFFIC CIRCULATION ANALYSIS

BREA PLAZA EXPANSION

Brea, California

July 29, 2021
(Original dated May 24, 2021)

Prepared for:

PLACEWORKS
3 MacArthur Place, Suite 1100
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LLG Ref. 2-19-4157-1

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REVISED TRAFFIC CIRCULATION ANALYSIS

BREA PLAZA EXPANSION

Brea, California
July 29, 2021 (Original dated May 24, 2021)

1.0 INTRODUCTION

This Traffic Circulation Analysis report addresses the potential traffic and circulation needs associated with Brea Plaza Expansion Project (hereinafter referred to as Project) in the City of Brea. Brea Plaza is an existing retail center addressed at 409-477 S. Associated Road and 1555, 1609, 1623, 1643 E. Imperial Highway that is generally located north of Imperial Highway, west of Associated Road, and east of SR-57 Freeway. The proposed Project consists of the demolition of an existing 18,450 square-foot (SF) movie theater and the construction of a mixed-use development consisting of 21,355 SF office space and 189 apartments.

1.1 Scope of Work

This traffic circulation report documents the findings and recommendations of a traffic analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the need for potential Project-related circulation improvements. The traffic analysis evaluates the existing operating conditions at nine (9) study intersections within the project vicinity, estimates the trip generation potential of the proposed Project, and forecasts future near-term (Year 2024) and General Plan Buildout (Year 2045) operating conditions without and with the proposed Project. Where necessary, intersection improvements are identified.

This traffic study report satisfies the traffic requirements of the City of Brea and is consistent with the current *Congestion Management Program (CMP) for Orange County.* The approved Scope of Work for this traffic study is included in ***Appendix A*** and was developed in conjunction with City of Brea Public Works Department staff.

The project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing weekday peak hour traffic count information has been collected at nine (9) study intersections for use in the preparation of intersection Level of Service (LOS) calculations. Information concerning cumulative projects (planned and/or approved) in the vicinity of the proposed Project has been researched at the Cities of Brea, Placentia and Fullerton. Based on our research, there are twelve (12) related projects in the City of Brea and two (2) related projects in the City of Fullerton. The fourteen (14) related projects were considered in the near-term cumulative traffic analysis for this project.

This traffic report analyzes existing and future weekday daily, AM peak hour and PM peak hour LOS traffic conditions for a near-term (Year 2024) and General Plan Buildout (Year 2045) traffic setting upon completion of the proposed Project. Near-term (Year 2024) cumulative daily and peak hour traffic forecasts were projected by incorporating both a one percent (1.0%) annual growth rate and the trip generation potential of fourteen (14) related projects. General Plan Buildout (Year 2045)

daily and peak hour traffic forecasts were projected based on traffic projections prepared by OCTA utilizing the OCTAM 5.0 Year 2045 Model.

1.2 Study Area

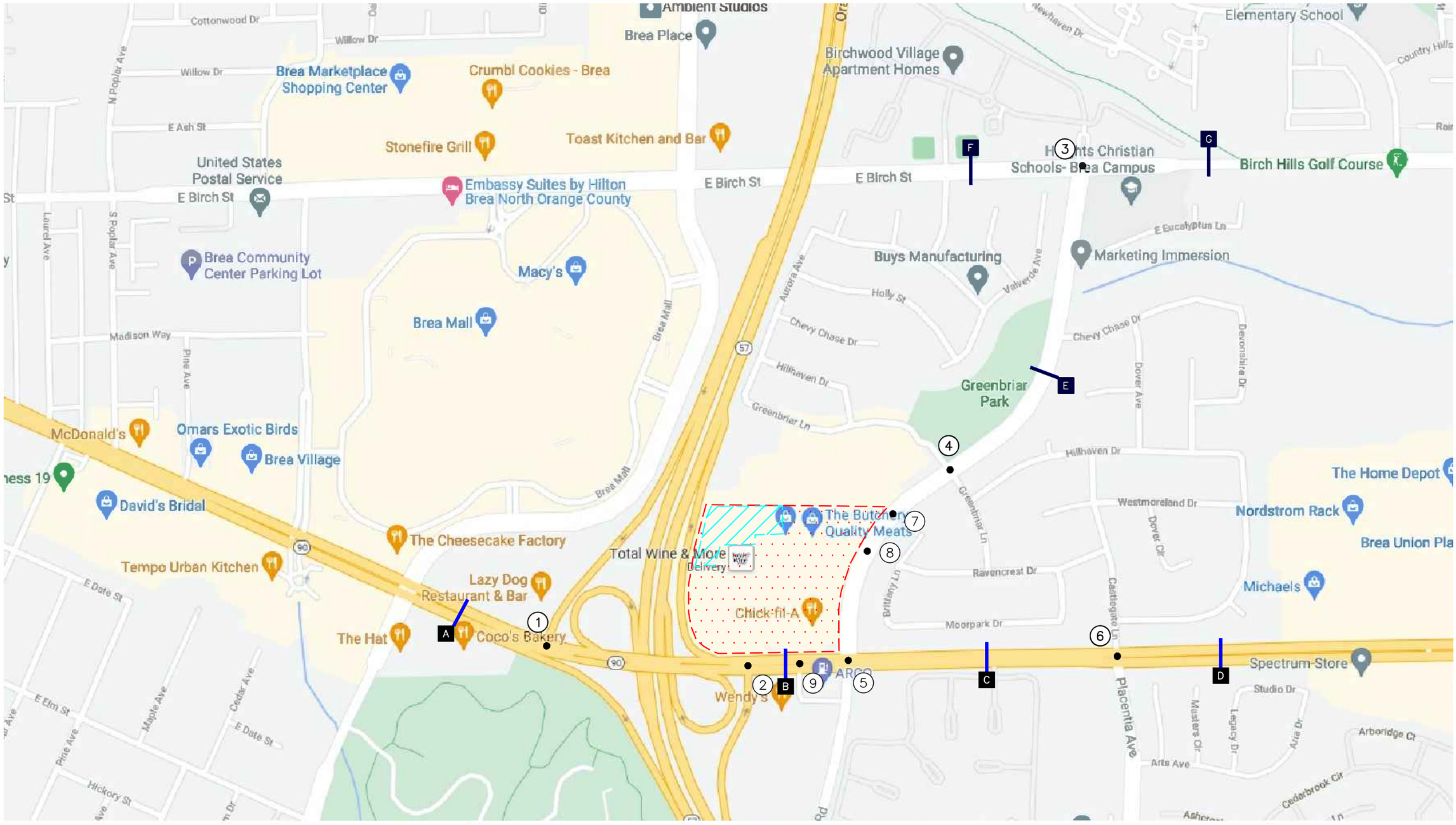
Nine (9) study intersections have been identified for evaluation in collaboration with City of Brea staff. The nine (9) intersections listed below provide regional and local access to the study area and define the extent of this traffic analysis.

Study Intersections – Jurisdiction

1. SR-57 SB Ramps at Imperial Highway (Caltrans)
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway (Caltrans)
3. S. Associated Road at Birch Street
4. S. Associated Road at Greenbriar Lane
5. S. Associated Road at Imperial Highway (Caltrans)
6. Castlegate Lane/Placentia Avenue at Imperial Highway (Caltrans)
7. S. Associated Road at Brea Plaza Driveway 2
8. S. Associated Road at Brea Plaza Driveway 3
9. Brea Plaza Driveway 4 at Imperial Highway (Caltrans)

Figure 1-1 presents a Vicinity Map, which illustrates the general location of the proposed Project and depicts the study locations and surrounding street system. The Level of Service (LOS) calculations at these study locations were used to evaluate the need for potential Project-related improvements associated with area growth, cumulative projects and the proposed Project. When necessary, this report recommends intersection and/or roadway improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service. Included in this Traffic Circulation Analysis are:

- Existing traffic counts,
- Estimated project traffic generation/distribution/assignment,
- Estimated cumulative project traffic generation/distribution/assignment,
- Weekday AM and PM peak hour capacity analyses for existing conditions,
- Weekday AM and PM peak hour capacity analyses for future near-term (Year 2024) traffic conditions without and with the proposed Project,
- Weekday AM and PM peak hour capacity analyses for General Plan Buildout (Year 2045) traffic conditions without and with the proposed Project,
- Intersection Vehicle Queueing Evaluation,
- Intersection Safety Evaluation,
- Site Access Evaluation, and
- Congestion Management Program Compliance Assessment.



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LINSCOTT LAW & GREENSPAN engineers

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SOURCE: GOOGLE

KEY

(#) = STUDY INTERSECTION

// = STUDY ROADWAY SEGMENT

= BREA PLAZA

= PROJECT AREA

FIGURE 1–1

VICINITY MAP

BREA PLAZA EXPANSION PROJECT, BREA

2.0 PROJECT DESCRIPTION

Brea Plaza is an existing retail center addressed at 409-477 S. Associated Road and 1555, 1609, 1623, 1643 E. Imperial Highway that is generally located north of Imperial Highway, west of Associated Road, and east of SR-57 Freeway in the City of Brea, California. ***Figure 2-1*** is an existing aerial photograph of the Project site, and also illustrates the general location of the proposed Project on the northwest corner of the subject property.

Table 2-1 summarizes the proposed Project development. The existing Brea Plaza includes 165,329 square-feet (SF) of floor area consisting of mixture of retail/commercial use, service/retail shops, a movie theatre, restaurant/ food uses and fast-food restaurants with drive-through. Parking for the retail center currently totals 725 on-site spaces with an additional 180 spaces available in an easement with Mercury Insurance during business hours and all spaces after 5:00 PM and on weekends. It is our understanding that the easement with Mercury Insurance will expire upon completion of the proposed Project, therefore, all of the project parking demands will be accommodated on-site.

The proposed Project includes a mixed-use development that consists of 21,355 SF of office space and 189 apartment units. Fifteen (15) of the proposed apartments are considered co-living units, which include five (5) 3-bedroom units and ten (10) four-bedroom units, therefore, to provide a conservative assessment, the co-living unit bedrooms have been counted as individual units for a total apartment count of 229 units.

The proposed Project also includes a 387-space and 10 tandem stall parking structure on the northwest quadrant of the subject property. The implementation of the proposed Project would require the demolition of the existing 18,450 SF movie theatre (Brea Plaza 5 Cinemas) and result in the overall loss of 116 surface parking spaces. ***Figure 2-2*** illustrates the conceptual site plan for the proposed Project prepared by Architects Orange, dated February 10, 2021.

2.1 Vehicular Site Access and Circulation

Vehicular access to Brea Plaza is currently provided via one (1) right-turn only and one (1) full access unsignalized driveways on Associated Road, and a right-turn only driveway on Imperial Highway, and the signalized intersection of Imperial Highway at SR-57 NB Ramps/Brea Plaza. No change in access to Brea Plaza is proposed as a part of the Project. Further, with the exception of the parking and circulation layout on the northwest corner of the site where the proposed Project will be constructed, no changes to the internal circulation and primary parking layout in the center and southern portion of the site will change. To maintain circulation around the entire property, the Project does propose to maintain/construct a "Fire Lane" along the northern and western edge of the Project thereby providing emergency vehicle as well as Project-related traffic the ability to circulate the entire site to access either Associated Road or Imperial Highway.

It should be noted that cross-access between Mercury Insurance and Brea Plaza is currently allowed via the Mercury Insurance easement. Patrons/employees of the Mercury Insurance Building are currently able to park in the existing parking spaces within Brea Plaza located in the north end of the

site. However, the easement will no longer be applicable as part of the proposed Project. Therefore, employees/patrons of Mercury Insurance will be expected to utilize Greenbriar Road to access their site rather than cutting through Brea Plaza. This shift in volumes has been accounted for under Project conditions.

2.2 Pedestrian and Bicycle Circulation

Brea Plaza is surrounded by other commercial and public facilities to the south and west of the site, including Brea Mall, and is also surrounded by existing residential uses to the north and east of the site. The walkability between these uses is facilitated by existing sidewalks, traffic signals at intersections that immediately border the property, and crosswalks.

Review of current conditions indicates that pedestrian connectivity between Brea Plaza and the adjacent uses are provided via the existing sidewalk system. Sidewalks are generally provided throughout the City along with crosswalks at most major intersections, and in particular, sidewalks are provided along Imperial Highway and S. Associated Road bordering the site. Furthermore, crosswalks are provided at each of the study intersections to provide connectivity across the streets that border the site. With the current pedestrian system now in place, access to and from the project site is adequate and will continue to serve the proposed Project. The proposed Project will protect the existing sidewalks, and if necessary, repair or construct new sidewalks along the project frontage per the City's request.

In addition to pedestrian connectivity, an existing Class II bike lane is provided along S. Associated Road, which connects to other nearby bicycle facilities including the existing Class II bike lane on Birch Street as well as the Class I bike trail (The Tracks at Brea Trail). Furthermore, the General Plan identifies an extension of the Class II bike lane along Birch Street, west of State College Boulevard, as well as the installation of a Class II bike lane along State College Boulevard. The proposed Project will continue to support and encourage bike mobility by providing both long-term and short-term bicycle parking spaces on-site to accommodate different types of bicycles (e.g. cargo bike, bike with trailer, etc.)

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SOURCE: GOOGLE

KEY

BREA PLAZA

PROJECT AREA

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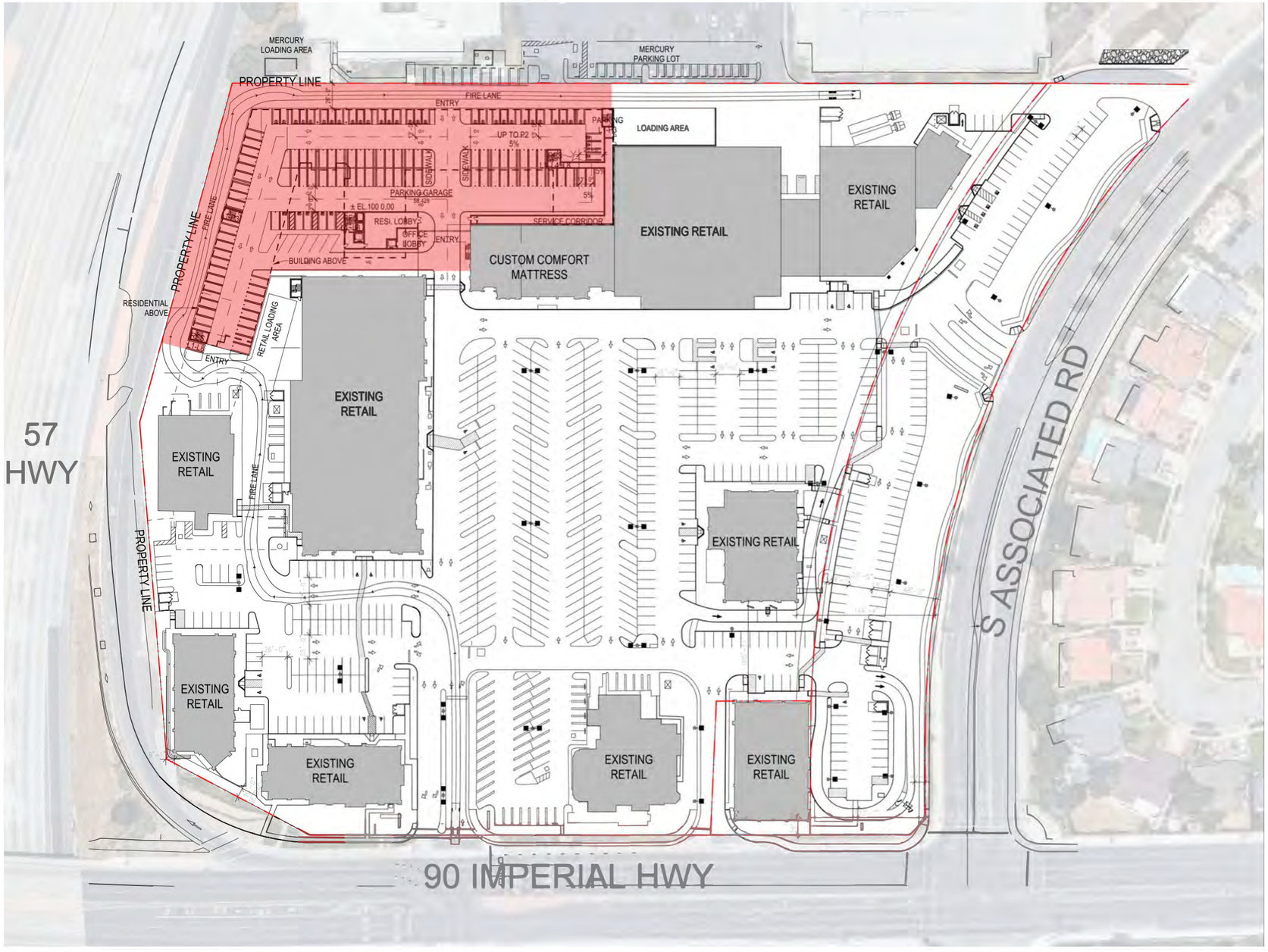
FIGURE 2-1

EXISTING SITE AERIAL

BREA PLAZA EXPANSION PROJECT, BREA



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SOURCE: ARCHITECTS ORANGE

LINSCOTT LAW & GREENSPAN engineers

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FIGURE 2-2

PROPOSED SITE PLAN

BREA PLAZA EXPANSION PROJECT, BREA

TABLE 2-1

PROJECT DEVELOPMENT SUMMARY[1]

Project Description	(1) Existing Site	(2) Demolition	(3) New Construction	(4) Total Updated Site
Land Use				
▪ Residential Apartments	--	--	229 DU[2]	229 DU[2]
▪ Office	--	--	21,355 SF	21,355 SF
▪ Medical Office	1,596 SF	--	--	1,596 SF
▪ Restaurants	42,649 SF	--	--	42,649 SF
▪ Movie Theater (1,100 seats with 5 screens)	18,450 SF	18,450 SF	--	--
▪ Grocery Store	16,206 SF	--	--	16,206 SF
▪ Retail	68,415 SF	--	--	68,415 SF
▪ Liquor Store	18,013 SF	--	--	18,013 SF
Total Project	**165,329 SF**	**18,450 SF**	**229 DU and 21,355 SF**	**229 DU and 168,234 SF**
Parking				
▪ 3-Level Parking Structure	--		387 spaces and 10 tandem stalls	387 spaces and 10 tandem stalls
▪ Surface Parking	725 spaces[3]	116 spaces	--	609 spaces
Total Parking	**725 spaces**	**116 spaces**	**387 spaces and 10 tandem stalls**	**996 spaces and 10 tandem stalls**

1 Project development summary is based on the proposed project site plan prepared by Architects Orange, dated February 10, 2021.

2 There is a total of 189 apartment units. A portion of the proposed apartments are considered co-living units, which include five (5) 3-bedroom units and ten (10) 4-bedroom units. Therefore, to provide a conservative assessment, the co-living unit bedrooms have been counted as individual units for a total apartment count of 229 units.

3 Currently, there are a total of 725 parking stalls plus an additional 180 spaces during business hours and all surface spaces after 5PM and weekend through an easement with Mercury Insurance. However, the easement with Mercury Insurance will no longer be applicable as part of the proposed Project and all of the project parking demands will be accommodated on-site.

3.0 EXISTING CONDITIONS

3.1 Existing Street System

The principal local network of streets serving the project site includes Birch Street, Imperial Highway, and S. Associated Road. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

Birch Street is a four-lane, divided roadway oriented in the east-west direction. The posted speed limit on Birch Street is 35 miles per hour (mph) west of State College Boulevard, 45 mph between State College Boulevard and S. Associated Road and 50 mph east of S. Associated Road. On-street parking is not permitted along this roadway. Birch Street is designated as a Primary Arterial in the City's Master Plan of Roadways. A traffic signal controls the study intersection of Birch Street at S. Associated Road.

Imperial Highway is a six-lane, divided roadway generally oriented in the east-west direction. The posted speed limit on Imperial Highway is 45 mph west of the SR-57 Freeway and 50 mph east of the SR-57 Freeway. On-street parking is not permitted along this roadway. Imperial Highway is designated as a Smart Street in the City's Master Plan of Roadways. A traffic signal controls the study intersections of Imperial Highway at SR-57 SB Ramps, SR-57 NB Ramps, S. Associated Road, and Castlegate Lane/Placentia Avenue. All signalized intersections along Imperial Highway are owned and operated by Caltrans.

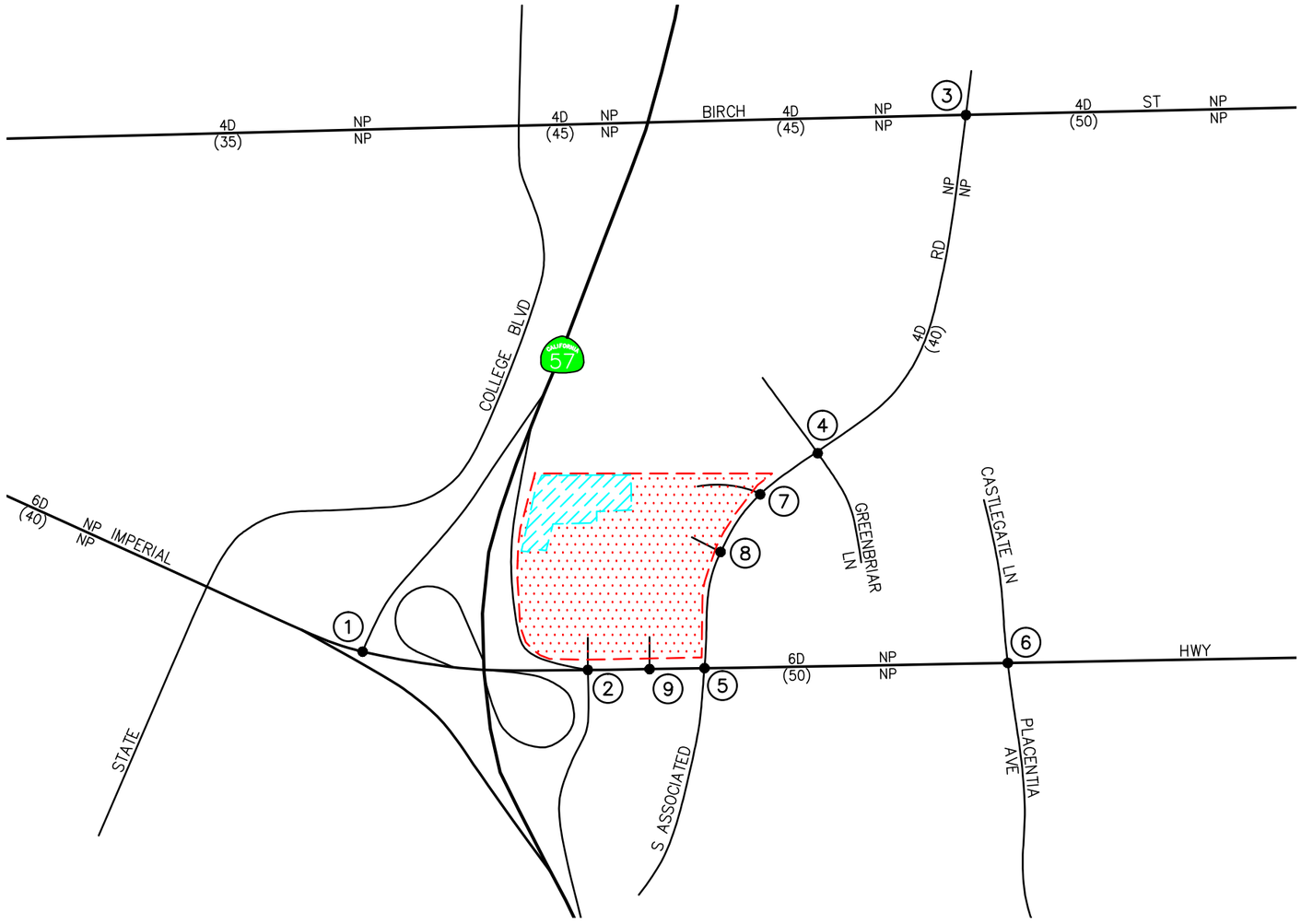
S. Associated Road is a four-lane, divided roadway generally oriented in the north-south direction. The posted speed limit on S. Associated Road is 40mph. On-street parking is not permitted along this roadway. S. Associated Road is designated as a Secondary Arterial in the City's Master Plan of Roadways. Traffic signals control the study intersections of S. Associated Road at Birch Street, Greenbriar Lane and Imperial Highway.

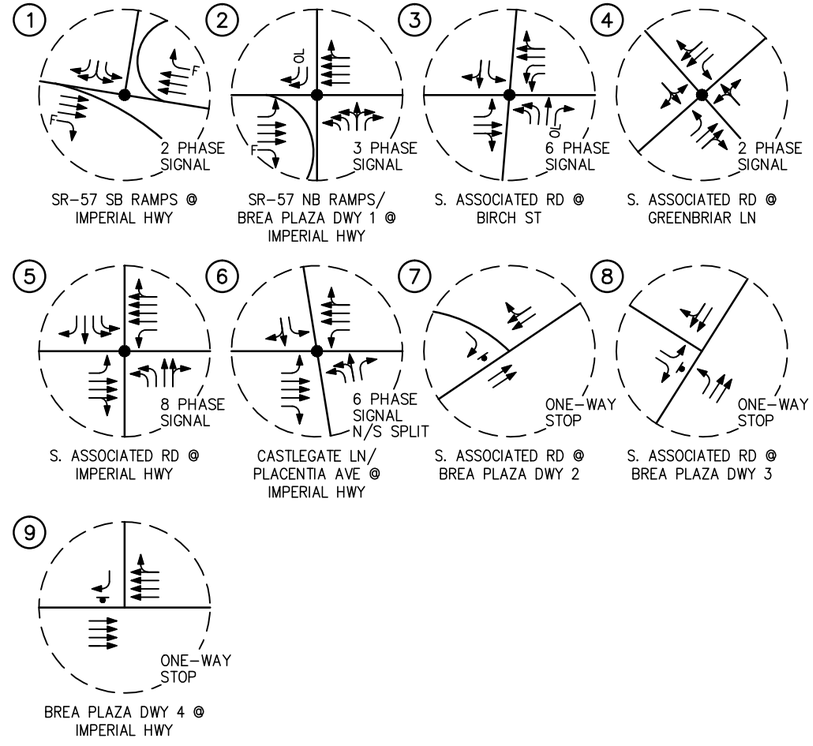
Figure 3-1 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the study intersections.

3.2 Existing Public Transit

Public transit bus service is provided in the project area by the Orange County Transportation Authority (OCTA). Four (4) OCTA bus routes operate within the vicinity of the Project site on Birch Street, S. Associated Road, Brea Boulevard, and State College Boulevard, which consist of the following:

- OCTA Route 57 (Brea to Newport Beach): Route 57 is a local bus route serving the Cities of Brea, Fullerton, Anaheim, Orange, Santa Ana, Costa Mesa, and Newport Beach. The major routes of travel include State College Boulevard and Bristol Street. Nearest to the project site are bus stops along State College Boulevard at the intersection of Imperial Highway. Route 57 operates on approximate 15-minute headways during weekdays and weekends.





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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION
= APPROACH LANE ASSIGNMENT
● = TRAFFIC SIGNAL, ▼ = STOP SIGN
P = PARKING, NP = NO PARKING
U = UNDIVIDED, D = DIVIDED
2 = NUMBER OF TRAVEL LANES

(XX)= POSTED SPEED LIMIT (MPH)
F = FREE-RIGHT
OL = OVERLAP
= BREA PLAZA
= PROJECT AREA

FIGURE 3-1

EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

BREA PLAZA EXPANSION PROJECT, BREA

- OCTA Route 129 (La Habra to Anaheim): Route 129 is a community bus route serving the Cities of Anaheim, Placentia, Yorba Linda, Brea, and La Habra. The major routes of travel include La Habra Boulevard, Brea Boulevard, Birch Street, and Kraemer Boulevard. Nearest to the project site are bus stops along Birch Street and S. Associated Road. Route 129 operates on approximate 45-minute headways during weekdays and 60-minute headways on weekends.

- OCTA Route 143 (La Habra to Brea): Route 143 is a community bus route serving the Cities of Fullerton, Brea, and La Habra. The major routes of travel include Whittier Boulevard, Harbor Boulevard, Brea Boulevard, and Birch Street. Nearest to the project site are bus stops on Birch Street at State College Boulevard, and at Brea Mall. Route 143 operates on approximate 75-minute headways during weekdays and 65-minute headways on weekends.

- OCTA Route 153 (Brea to Anaheim): Route 153 is a community bus route serving the Cities of Brea, Placentia, Fullerton, Anaheim, and Orange. The major routes of travel include Placentia Avenue. Nearest to the project site are bus stops on S. Associated Road at Greenbriar Lane and on S. Associated Road at Imperial Highway. Route 153 operates on approximate 60-minute headways during weekdays and weekends.

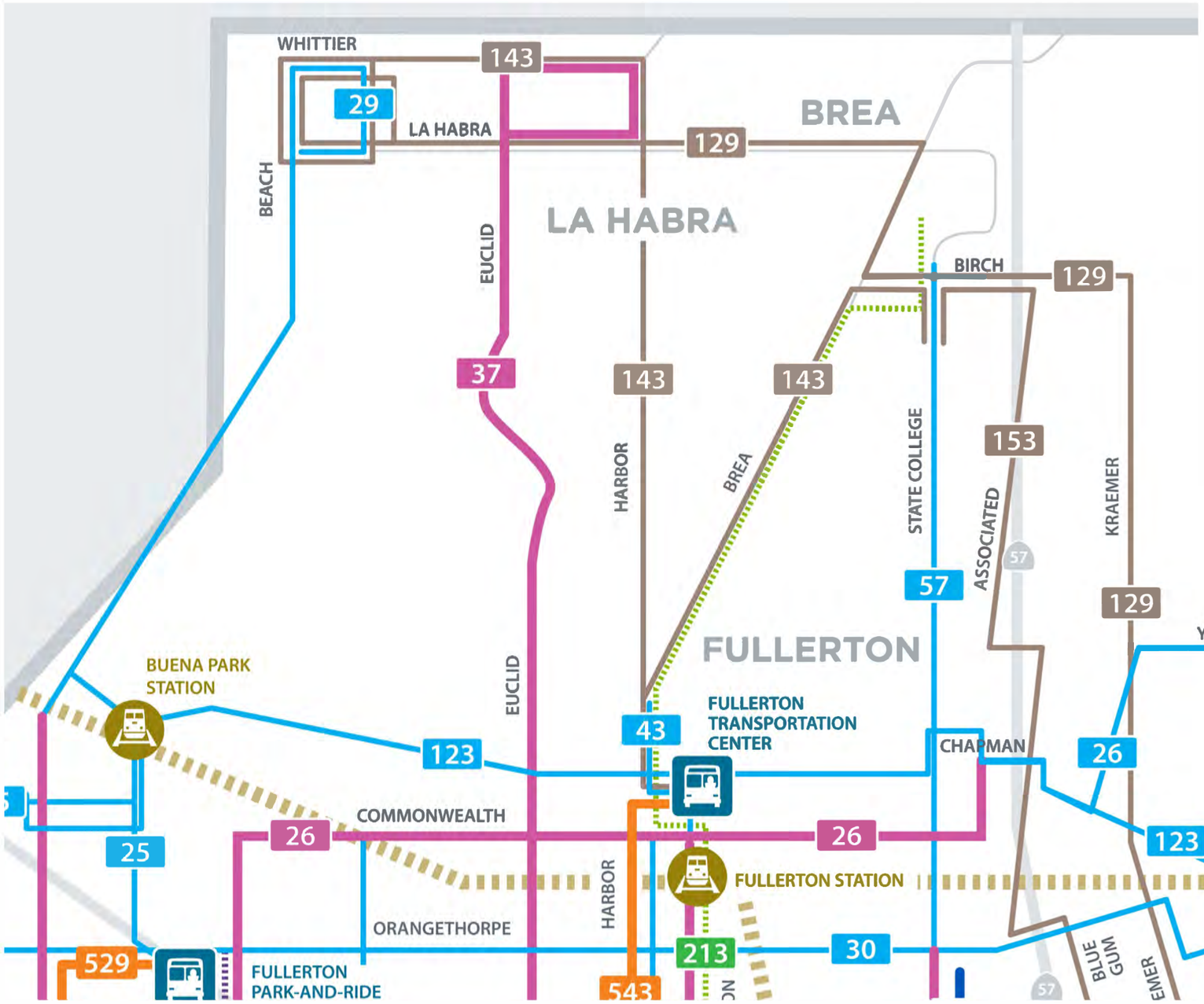
Figure 3-2 graphically illustrates the transit routes of OCTA within the vicinity of the Project site. ***Figure 3-3*** identifies the location of the existing bus stops in proximity to the Project site.

3.3 Existing Bikeway Plan

The City of Brea promotes bicycling as a means of mobility and a way in which to improve the quality of life within its community. The Bikeway Plan recognizes the needs of bicycle users and aims to create a complete and safe bicycle network throughout the City. The City of Brea Bike Plan (existing and proposed) is shown on ***Figure 3-4***. In close proximity to the site are existing Class II bike lanes provided along Birch Street, east of State College Boulevard, and on S. Associated Road, as well as a Class I bike trail (The Tracks at Brea Trail). There are proposed Class II bike lanes along Birch Street, west of State College Boulevard, and on State College Boulevard.

3.4 Existing Traffic Volumes

Due to the Covid-19 virus, the Governor of California has issued a state-wide "stay at home" order which has ultimately resulted in a decrease in traffic. Based on these current conditions, the ability to collect traffic counts to establish baseline conditions that would be reflective of traffic conditions without "stay at home" orders in effect are not possible. As such, to establish "baseline" traffic conditions, pre-Covid-19 (i.e. under normal circumstances without "stay at home" orders in effect), LLG has researched historic data and was able to obtain Year 2018/2019 counts at five (5) of the study locations as summarized below:



System Map

- Routes offering 15 minutes (or less) Weekday rush hour frequency
- Local Routes (1-99)
- Community Routes (100-199)
- OC Express Routes (200-299) Weekday Rush Hour Only
- Metrolink Stationlink Routes (400-499) Weekday Rush Hour Only
- Bravo Limited Stop Service (500-599)
- Express Service (700-799) Weekday Rush Hour Only
- City Shuttle
- Rail Stations
- OC Bus Transit Centers

Effective February 14, 2021

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SOURCE: OCTA

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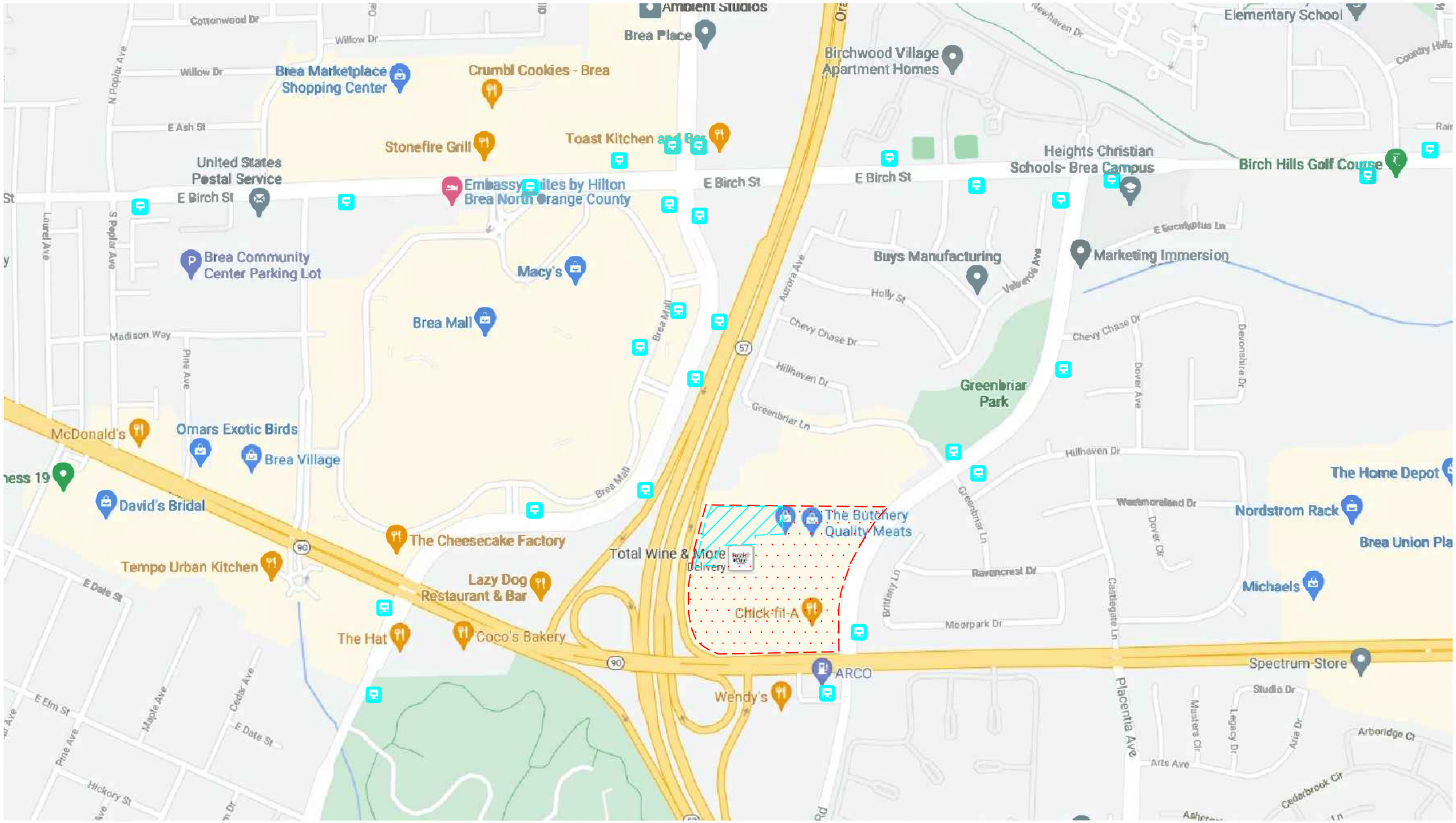
N NO SCALE

FIGURE 3-2

OCTA ROUTES

BREA PLAZA EXPANSION PROJECT, BREA



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SOURCE: GOOGLE

KEY

= BREA PLAZA

= PROJECT AREA

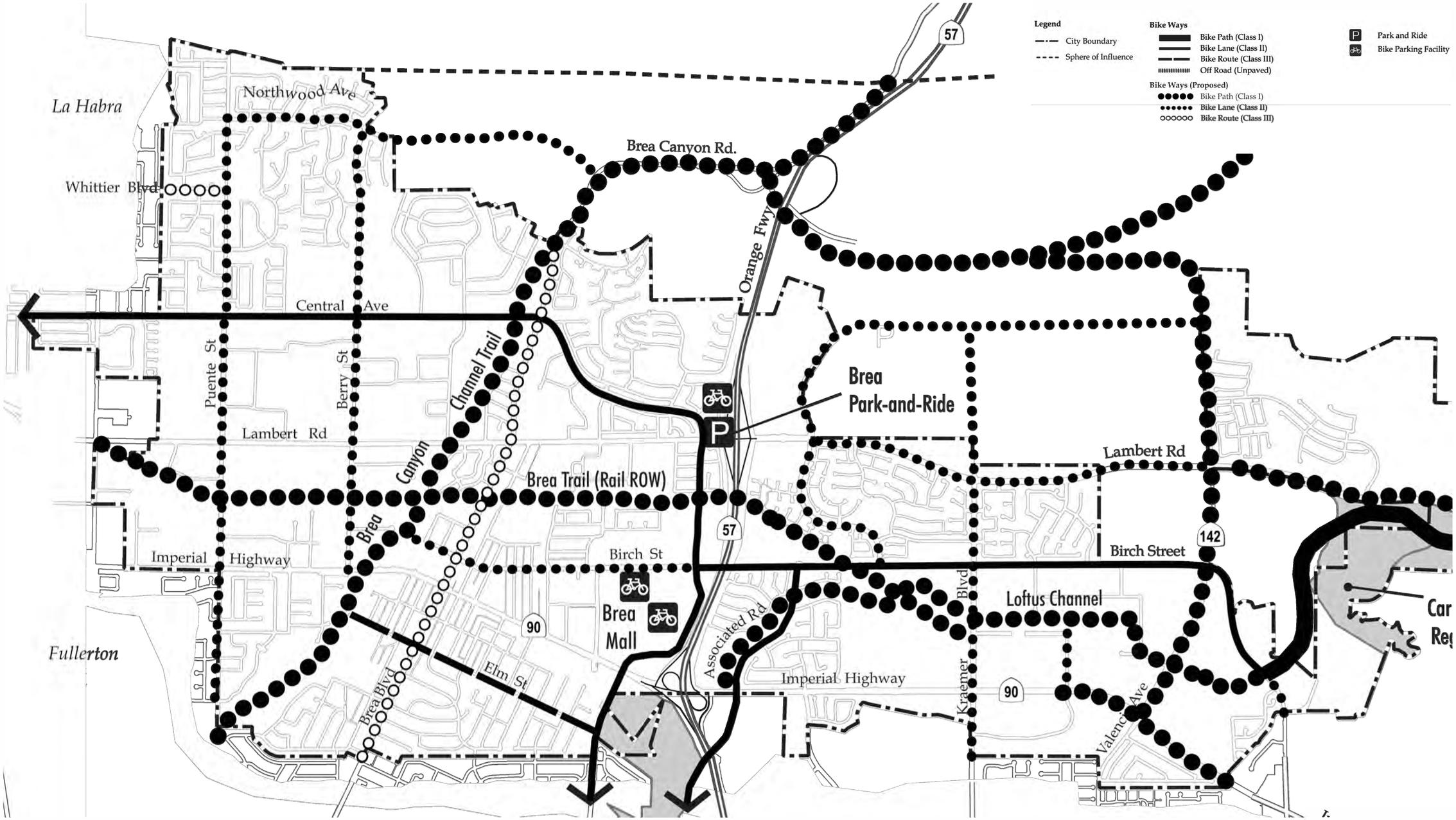
= TRANSIT STOP

N NO SCALE

FIGURE 3-3

TRANSIT STOP LOCATIONS

BREA PLAZA EXPANSION PROJECT, BREA



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SOURCE: CITY OF BREA

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

FIGURE 3–4

CITY OF BREA BIKE PLAN

BREA PLAZA EXPANSION PROJECT, BREA

Study Intersection		Historic Traffic Counts Available?	Collected Year 2020 Covid-19 Traffic Counts?
1.	SR-57 SB Ramps at Imperial Highway	Yes	--
2.	SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway	Yes	--
3.	S. Associated Road at Birch Street	Yes	--
4.	S. Associated Road at Greenbriar Lane	**No**	**Yes**
5.	S. Associated Road at Imperial Highway	Yes	**Yes**
6.	Castlegate Lane/Placentia Avenue at Imperial Highway	Yes	**Yes**
7.	S. Associated Road at Brea Plaza Driveway 2	--	--
8.	S. Associated Road at Brea Plaza Driveway 3	--	--
9.	Brea Plaza Driveway 4 at Imperial Highway	--	--

Given the availability of historic data, the following steps were used to establish Existing Year 2021 pre-Covid-19 baseline traffic conditions:

(1) Historic data is available at five (5) locations for Year 2018/2019.

(2) Given data is not available at one (1) study location (Intersection #4 – not including the existing Brea Plaza driveways), LLG collected Year 2020 Covid-19 traffic counts at the study location, as well as intersections adjacent to the missing intersections, in October 2020 for use in establishing traffic counts/turning movement percentages.

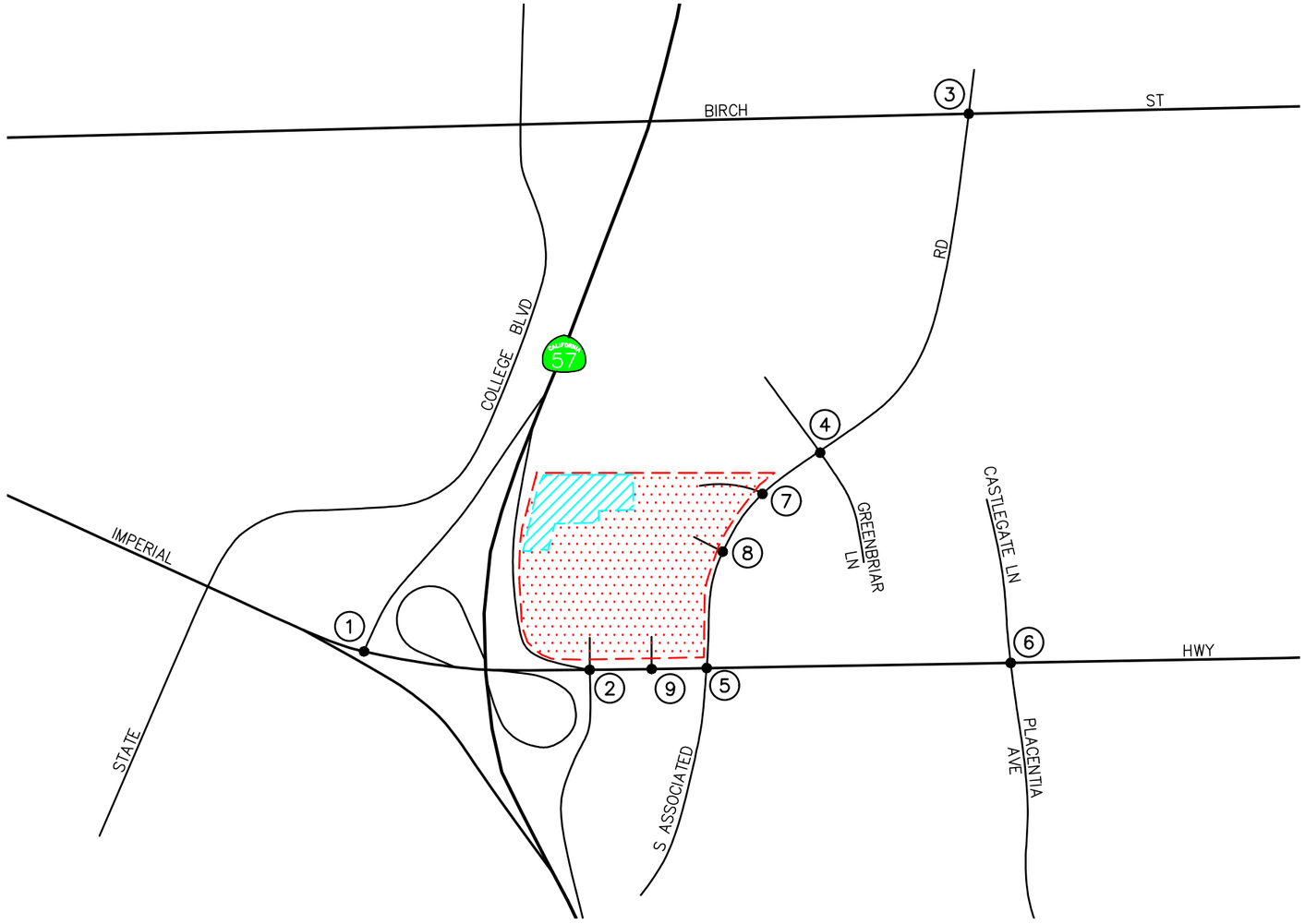
(3) Using information from (1) and (2), compare 2018/2019 to 2020 to establish change in traffic counts due to current COVID-19 environment.

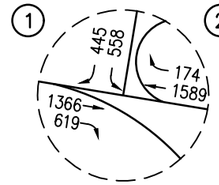
(4) Apply the rate calculated in (3) to 2020 COVID-19 traffic counts and forecast 2018/2019 traffic conditions at the one (1) missing intersection (Intersection #4).

(5) Lastly, apply an annual growth factor of 1% per year to the Year 2018/2019 traffic conditions to establish Year 2021 pre-COVID-19 baseline traffic conditions.

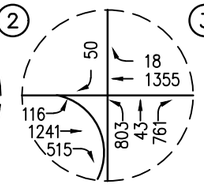
Additionally, the existing ingress and egress volumes for the Brea Plaza driveways (Intersections 2, 7, 8 and 9) were based on forecasted trips for the existing center rather than applying adjustments in place of collecting traffic counts.

Figures 3-5 and ***3-6*** illustrate the existing Year 2021 weekday AM and PM peak hour traffic volumes at the nine (9) study intersections evaluated in this report, respectively. *Figure 3-6* also presents the existing average weekday daily traffic volumes for the seven (7) roadway segments in the vicinity of the proposed Project.

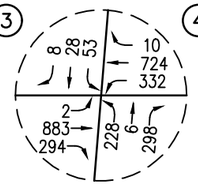




SR-57 SB RAMPS @
IMPERIAL HWY



SR-57 NB RAMPS/
BREA PLAZA DWY 1 @
IMPERIAL HWY



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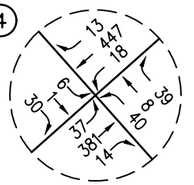
BIRCH ST



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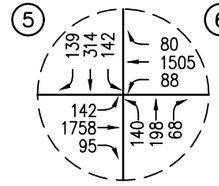
GREENBRIAR LN



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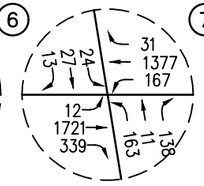
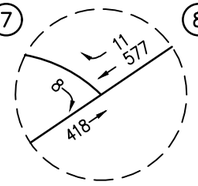


CASTLEGATE LN/
PLACENTIA AVE @
IMPERIAL HWY



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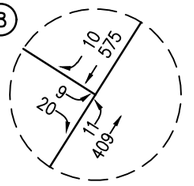
BREA PLAZA DWY 2



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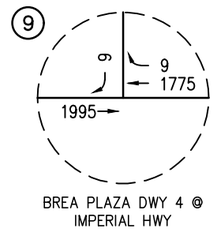

BREA PLAZA DWY 4 @
IMPERIAL HWY

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

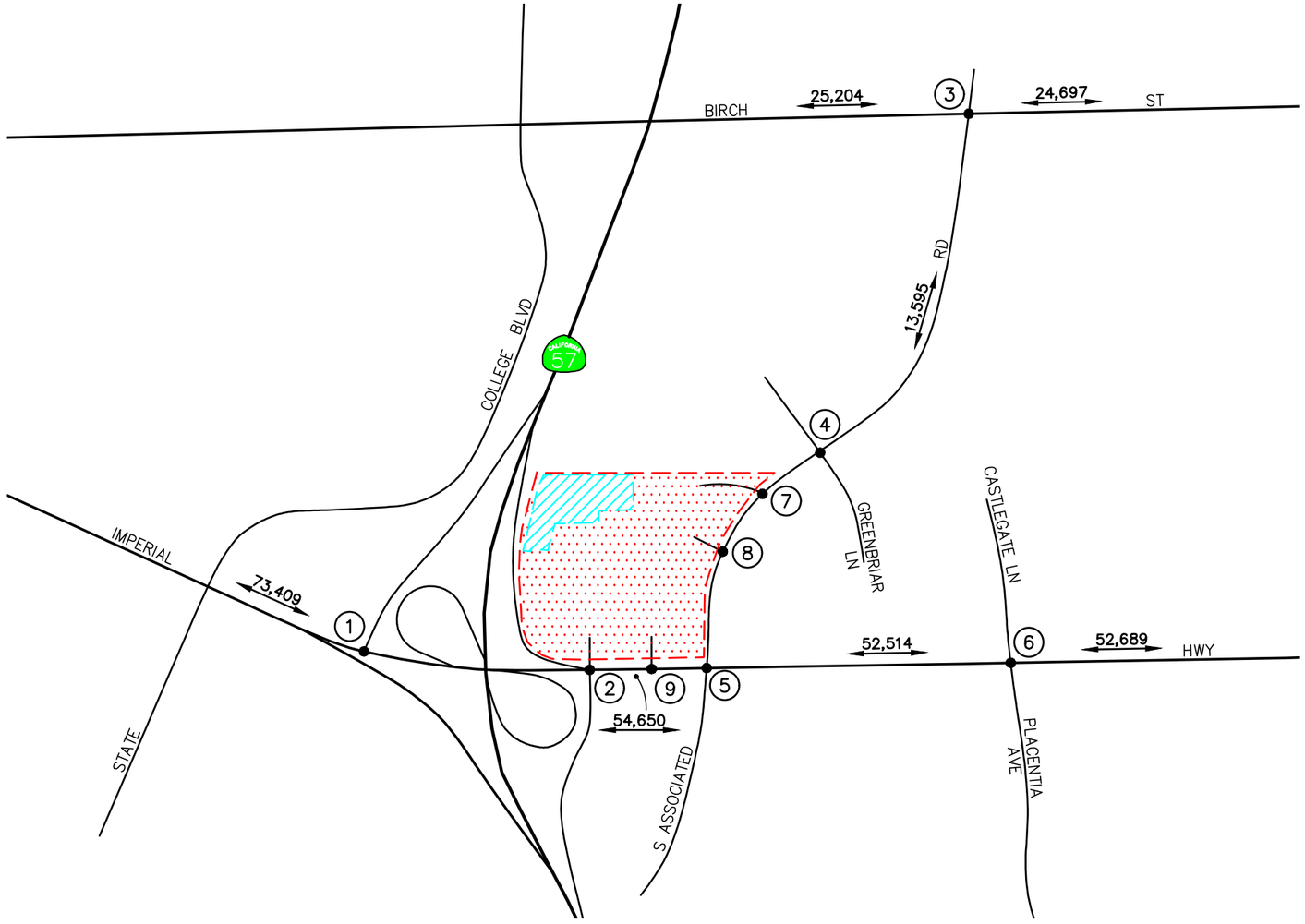
= BREA PLAZA

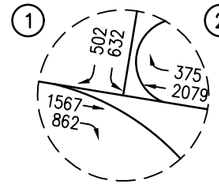
= PROJECT AREA

FIGURE 3-5

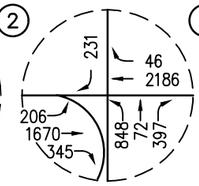
EXISTING AM PEAK HOUR TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA

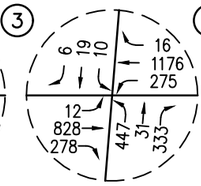




SR-57 SB RAMPS @
IMPERIAL HWY



SR-57 NB RAMPS/
BREA PLAZA DWY 1 @
IMPERIAL HWY



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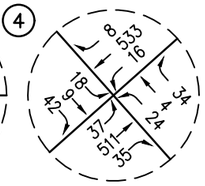
BIRCH ST



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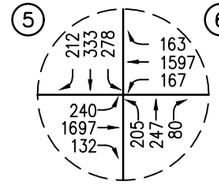

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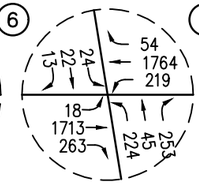
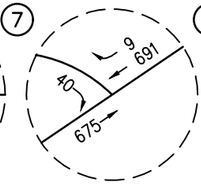
IMPERIAL HWY



CASTLEGATE LN/
PLACENTIA AVE @
IMPERIAL HWY



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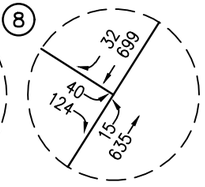
BREA PLAZA DWY 2



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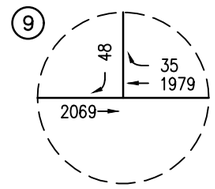

BREA PLAZA DWY 4 @
IMPERIAL HWY

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION
X,XXX = DAILY TRAFFIC VOLUMES
= BREA PLAZA
= PROJECT AREA

FIGURE 3-6

EXISTING PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA

Appendix B contains a summary table for the Year 2021 pre-Covid-19 baseline volume development as well as the detailed peak hour and daily traffic count sheets for the study intersections and roadway segments evaluated in this report.

3.5 Level of Service (LOS) Analysis Methodologies

Existing weekday AM and PM peak hour operating conditions for the study intersections were evaluated using the *Intersection Capacity Utilization* (ICU) methodology for signalized intersections as well as the methodology outlined in the *Highway Capacity Manual*. Per the City's direction, the Intersection Capacity Utilization (ICU) method will be used for the purpose of consistency with the City of Brea General Plan.

3.5.1 *Intersection Capacity Utilization (ICU) Method of Analysis*

Weekday AM and PM peak hour operating conditions for the signalized study intersections were evaluated using the Intersection Capacity Utilization (ICU) method. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU numerical value represents the percent signal (green) time, and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing.

Per City of Brea requirements, the ICU calculations use a lane capacity of 1,700 vehicles per hour (vph) for through and all turn lanes. A clearance adjustment factor of 0.05 was added to each Level of Service calculation.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in ***Table 3-1***.

3.5.2 *Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)*

Weekday AM and PM peak hour operating conditions for study intersections were evaluated using the methodology outlined in *Chapter 19 of the Highway Capacity Manual 6 (HCM 6)* for signalized intersections.

Based on the HCM operations method of analysis, level of service for signalized intersections and approaches is defined in terms of control delay, which is a measure of the increase in travel time due to traffic signal control, driver discomfort, and fuel consumption. Control delay includes the delay associated with vehicles slowing in advance of an intersection, the time spent stopped on an intersection approach, the time spent as vehicles move up in the queue, and the time needed for vehicles to accelerate to their desired speed. LOS criteria for traffic signals are stated in terms of the control delay in seconds per vehicle. The LOS thresholds established for the automobile mode at a signalized intersection are shown in ***Table 3-2***.

3.5.3 *Highway Capacity Manual (HCM) Method of Analysis (Unsignalized Intersections)*

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. LOS criteria for unsignalized intersections differ from LOS criteria for signalized intersections as signalized intersections are designed for heavier traffic and therefore a greater delay. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable, which can reduce users' delay tolerance.

Two-way stop-controlled intersections are comprised of a major street, which is uncontrolled, and a minor street, which is controlled by stop signs. Level of service for a two-way stop-controlled intersection is determined by the computed or measured control delay. The control delay by movement, by approach, and for the intersection as a whole is estimated by the computed capacity for each movement. LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. The worst side street approach delay is reported. LOS is not defined for the intersection as a whole or for major-street approaches, as it is assumed that major-street through vehicles experience zero delay. The HCM control delay value range for two-way stop-controlled intersections is shown in ***Table 3-3***.

3.6 Level of Service Criteria

According to City of Brea, LOS D is the minimum acceptable condition that should be maintained during the weekday morning and evening peak commute hours at arterial intersections. LOS E is the minimum acceptable condition that should be maintained during the weekday morning and evening peak commute hours for Orange County CMP designated intersections. Based on the above, the following is the LOS required for each intersection:

LOS "D" Requirements – Study Intersections

3. S. Associated Road at Birch Street
4. S. Associated Road at Greenbriar Lane
5. S. Associated Road at Imperial Highway (Caltrans)
6. Castlegate Lane/Placentia Avenue at Imperial Highway (Caltrans)
7. S. Associated Road at Brea Plaza Driveway 2
8. S. Associated Road at Brea Plaza Driveway 3
9. Brea Plaza Driveway 4 at Imperial Highway (Caltrans)

LOS "E" Requirements – Study Intersections

1. SR-57 SB Ramps at Imperial Highway (Caltrans)
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway (Caltrans)

TABLE 3-1

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (ICU METHODOLOGY)

Level of Service (LOS)	Intersection Capacity Utilization Value (V/C)	Level of Service Description
A	≤ 0.600	EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.601 – 0.700	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.701 – 0.800	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.801 – 0.900	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.901 – 1.000	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.000	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.

TABLE 3-2

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM METHODOLOGY)[4]

Control Delay (sec/veh)	Level of Service (LOS)	Level of Service Description
≤ 10	A	This level of service occurs when the v/c ratio is low and either progression is exceptionally favorable or the cycle length is very short.
> 10-20	B	This level generally occurs when the v/c ratio is low and either progression is highly favorable or the cycle length is short.
> 20-35	C	Average traffic delays. These higher delays may result when progression is favorable or the cycle length is moderate. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
> 35-55	D	Long traffic delays. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop and individual cycle failures are noticeable.
> 55-80	E	Very long traffic delays. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent.
> 80	F	Severe congestion. This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

[4] Source: *Highway Capacity Manual*, Chapter 18: Signalized Intersections.

TABLE 3-3

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM)[5]

Level of Service (LOS)	Highway Capacity Manual Delay Value (sec/veh)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

[5] Source: *Highway Capacity Manual 6th Edition*, Chapter 20 (Two-Way Stop Control).

3.7 Existing Level of Service Results

3.7.1 *Existing Conditions Intersection Capacity Analysis (ICU Methodology)*

Table 3-4 summarizes the existing peak hour service level calculations for the six (6) signalized study intersections evaluated under ICU analysis based on existing traffic volumes and current street geometrics. Review of *Table 3-4* indicates that all of the signalized study intersections currently operate at acceptable service levels during the weekday AM and PM peak hours.

Appendix C presents the ICU LOS calculation worksheets for the study intersections.

3.7.2 *Existing Conditions Intersection Capacity Analysis (HCM Methodology)*

Table 3-5 summarizes the existing peak hour service level calculations for the nine (9) study intersections evaluated under HCM analysis based on existing traffic volumes and current street geometrics. Review of *Table 3-5* indicates that all of the study intersections currently operate at acceptable service levels during the weekday AM and PM peak hours.

Appendix D presents the HCM LOS calculation worksheets for the study intersections.

TABLE 3-4

EXISTING (YEAR 2021) PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

	Study Intersection	Jurisdiction	Minimum Acceptable LOS	Control Type	Time Period	ICU	LOS
1.	SR-57 SB Ramps at Imperial Highway	Brea/ Caltrans	E	2∅ Traffic Signal	AM	0.558	A
					PM	0.680	B
2.	SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway	Brea/ Caltrans	E	3∅ Traffic Signal	AM	0.557	A
					PM	0.693	B
3.	S. Associated Road at Birch Street	Brea	D	6∅ Traffic Signal	AM	0.603	B
					PM	0.602	B
4.	S. Associated Road at Greenbriar Lane	Brea	D	2∅ Traffic Signal	AM	0.262	A
					PM	0.286	A
5.	S. Associated Road at Imperial Highway	Brea/ Caltrans	D	8∅ Traffic Signal	AM	0.691	B
					PM	0.763	C
6.	Placentia Avenue/Castlegate Lane at Imperial Highway	Brea/ Caltrans	D	6∅ Traffic Signal	AM	0.590	A
					PM	0.684	B
7.	S. Associated Road at Brea Plaza Driveway 2	Brea	D	One -Way Stop	AM	--	--
					PM	--	--
8.	S. Associated Road at Brea Plaza Driveway 3	Brea	D	One -Way Stop	AM	--	--
					PM	--	--
9.	Brea Plaza Driveway 4 at Imperial Highway	Brea/ Caltrans	D	One -Way Stop	AM	--	--
					PM	--	--

Notes:

- ICU = Intersection Capacity Utilization
- LOS = Level of Service, please refer to *Table 3-1* for the LOS definitions
- ∅ = Phase

TABLE 3-5

EXISTING (YEAR 2021) PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

Study Intersection	Jurisdiction	Minimum Acceptable LOS	Control Type	Time Period	Delay (s/v)	LOS
1. SR-57 SB Ramps at Imperial Highway	Brea/ Caltrans	E	2∅ Traffic Signal	AM	14.9	B
				PM	15.3	B
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway	Brea/ Caltrans	E	3∅ Traffic Signal	AM	22.7	C
				PM	23.3	C
3. S. Associated Road at Birch Street	Brea	D	6∅ Traffic Signal	AM	27.9	C
				PM	27.5	C
4. S. Associated Road at Greenbriar Lane	Brea	D	2∅ Traffic Signal	AM	8.3	A
				PM	6.1	A
5. S. Associated Road at Imperial Highway	Brea/ Caltrans	D	8∅ Traffic Signal	AM	26.7	C
				PM	39.5	D
6. Placentia Avenue/Castlegate Lane at Imperial Highway	Brea/ Caltrans	D	6∅ Traffic Signal	AM	17.7	B
				PM	23.4	C
7. S. Associated Road at Brea Plaza Driveway 2	Brea	D	One -Way Stop	AM	10.3	B
				PM	11.1	B
8. S. Associated Road at Brea Plaza Driveway 3	Brea	D	One -Way Stop	AM	12.5	B
				PM	16.3	C
9. Brea Plaza Driveway 4 at Imperial Highway	Brea/ Caltrans	D	One -Way Stop	AM	21.4	C
				PM	30.9	D

Notes:

- s/v = seconds per vehicle
- LOS = Level of Service, please refer to *Tables 3-2 and 3-3* for the LOS definitions
- ∅ = Phase

4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic characteristics of the proposed Project, a multi-step process has been utilized. The first step is traffic generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is traffic distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/expected future travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the proposed project is isolated by comparing operational (LOS) conditions at selected study intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated.

5.0 PROJECT TRAFFIC CHARACTERISTICS

5.1 Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. The trip generation potential of the proposed Project will be estimated using trip rates contained in the 10th Edition of *Trip Generation,* published by the Institute of Transportation Engineers (ITE), [Washington, D.C., 2017].

Table 5-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project based on the entire Brea Plaza retail center and also presents the proposed project's forecast peak hour and daily traffic volumes. As shown in the upper portion of *Table 5-1,* ITE Land Use 221: Multifamily Housing (Mid-Rise), ITE 444: Movie Theater, ITE 710: General Office Building, and ITE 820: Shopping Center trip rates will be used to forecast the trip generation potential of the proposed Project, as well as the trip generation potential of a fully occupied existing Brea Plaza.

A review of the middle portion of *Table 5-1* indicates that a fully occupied Brea Plaza is forecast to generate approximately 8,963 daily trips, with 202 trips (126 inbound, 76 outbound) produced in the AM peak hour and 576 trips (283 inbound, 293 outbound) produced in the PM peak hour on a "typical" weekday, and 12,644 daily trips with 1,261 trips (646 inbound, 615 outbound) produced in the Midday peak hour on a "typical" Saturday.

A review of the lower portion of *Table 5-1* indicates that the trip generation associated with Brea Plaza upon implementation of the proposed Project is forecast to generate approximately 7,283 daily trips, with 302 trips (165 inbound, 137 outbound) produced in the AM peak hour and 516 trips (250 inbound, 266 outbound) produced in the PM peak hour on a "typical" weekday, and 10,362 daily trips with 772 trips (370 inbound, 402 outbound) produced in the Midday peak hour on a "typical" Saturday.

When the existing Brea Plaza is compared to the retail center with the proposed Project, the implementation of the proposed Project is forecast result in 1,680 *fewer* weekday daily trips, 100 *more* weekday AM peak hour trips, and 60 *fewer* weekday PM peak hour trips, as well as 2,282 *fewer* Saturday daily trips, and 489 *fewer* Saturday midday peak hour trips. As a result of trips documented in *Table 5-1,* which identifies changes to the Saturday daily and peak hour trips, a Saturday analysis is not recommended. Therefore, this traffic analysis will be based on the net AM peak hour and PM peak hour project trips.

5.2 Project Traffic Distribution and Assignment

Figures 5-1 through ***5-4*** presents the project trip distribution for the existing retail land uses, proposed retail land uses, proposed residential, and proposed office, respectively. The project trip distributions have been distributed and assigned to the adjacent street system based on the following considerations:

- location of site access points in relation to the surrounding street system,
- the site's proximity to major traffic carriers and regional access routes,
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- presence of traffic congestion in the surrounding vicinity, and
- ingress/egress availability at the project site.

The anticipated weekday AM and PM peak hour project traffic volumes associated with the proposed Project are presented in ***Figures 5-5*** and ***5-6***, respectively. *Figure 5-6* also presents the weekday daily Project traffic volumes. The traffic volume assignments presented in *Figures 5-5* and *5-6* reflect the traffic distribution characteristics shown in *Figures 5-1* through *5-4* and the traffic generation forecast presented in *Table 5-1*.

TABLE 5-1

PROJECT TRIP GENERATION FORECAST – ENTIRE BREA PLAZA[6]

Project Description	Weekday							Saturday			
	Daily	AM Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
	2-Way	Enter	Exit	Total	Enter	Exit	Total	2-Way	Enter	Exit	Total
Trip Generation Rates											
▪ 221: Multifamily Housing (Mid-Rise) (TE/DU)	5.44	26%	74%	0.36	61%	39%	0.44	4.91	49%	51%	0.44
▪ 444: Movie Theater (TE/Seat)	1.76	--	--	--	55%	45%	0.09	2.24	56%	44%	0.46
▪ 710: General Office Building (TE/TSF)	9.74	86%	14%	1.16	16%	84%	1.15	2.21	54%	46%	0.53
▪ 820: Shopping Center (TE/TSF GLA)	Eq.[7]	62%	38%	Eq.[7]	48%	52%	Eq.[7]	Eq.[7]	52%	48%	Eq.[7]
Existing Brea Plaza											
▪ Existing Shopping Center (146,879 SF)	7,808	140	85	225	347	375	722	11,311	403	436	839
Pass-by Reduction[8]	-781	-14	-9	-23	-118	-127	-245	-1,131	-40	-44	-84
Existing Shopping Center Total	**7,027**	**126**	**76**	**202**	**229**	**248**	**477**	**10,180**	**363**	**392**	**755**
▪ Existing Theater (1,100 seats)	1,936	--	--	--	54	45	99	2,464	283	223	506
Existing Brea Plaza Total	**8,963**	**126**	**76**	**202**	**283**	**293**	**576**	**12,644**	**646**	**615**	**1,261**
Proposed Brea Plaza											
▪ Existing Shopping Center (146,879 SF)	7,808	140	85	225	347	375	722	11,311	403	436	839
Internal Capture[9]	-602	-2	-1	-3	-20	-30	-50	-507	-23	-25	-48
Subtotal	7,206	138	84	222	327	345	672	10,804	380	411	791
Pass-by Reduction[8]	-721	-14	-8	-22	-111	-117	-228	-1,080	-38	-41	-79
Proposed Shopping Center Total	**6,485**	**124**	**76**	**200**	**216**	**228**	**444**	**9,724**	**342**	**370**	**712**
▪ Proposed Residential (229 DU)	1,246	21	61	82	62	39	101	1,124	49	52	101
Internal Capture[9]	-576	0	-2	-2	-29	-18	-47	-508	-23	-24	-47
Proposed Residential Total	**670**	**21**	**59**	**80**	**33**	**21**	**54**	**616**	**26**	**28**	**54**
▪ Proposed Office (21,355 SF)	208	22	3	25	4	21	25	47	6	5	11
Internal Capture[9]	-80	-2	-1	-3	-3	-4	-7	-25	-4	-1	-5
Proposed Office Total	**128**	**20**	**2**	**22**	**1**	**17**	**18**	**22**	**2**	**4**	**6**
Proposed Brea Plaza Total	**7,283**	**165**	**137**	**302**	**250**	**266**	**516**	**10,362**	**370**	**402**	**772**
Net Trip Generation (Proposed Brea Plaza - Existing Brea Plaza)	**-1,680**	**39**	**61**	**100**	**-33**	**-27**	**-60**	**-2,282**	**-276**	**-213**	**-489**

Notes:

- TE/TSF = Trip End per Thousand Square Feet Gross Leasable Area
- TE/DU = Trip End per Dwelling Unit
- TE/Seat = Trip End per Seat

6 Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).

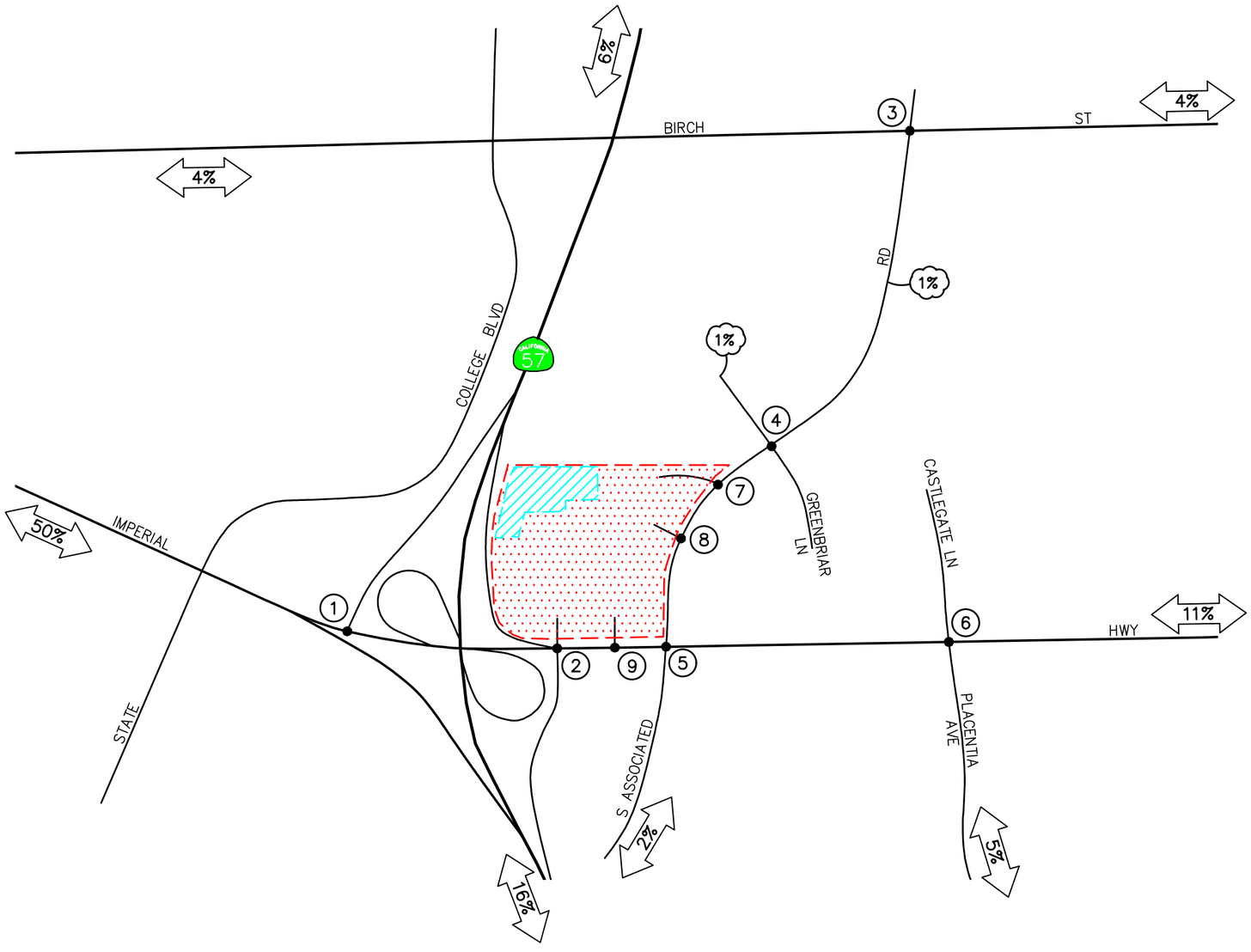
7 Trip Generation rates based on the following equations:

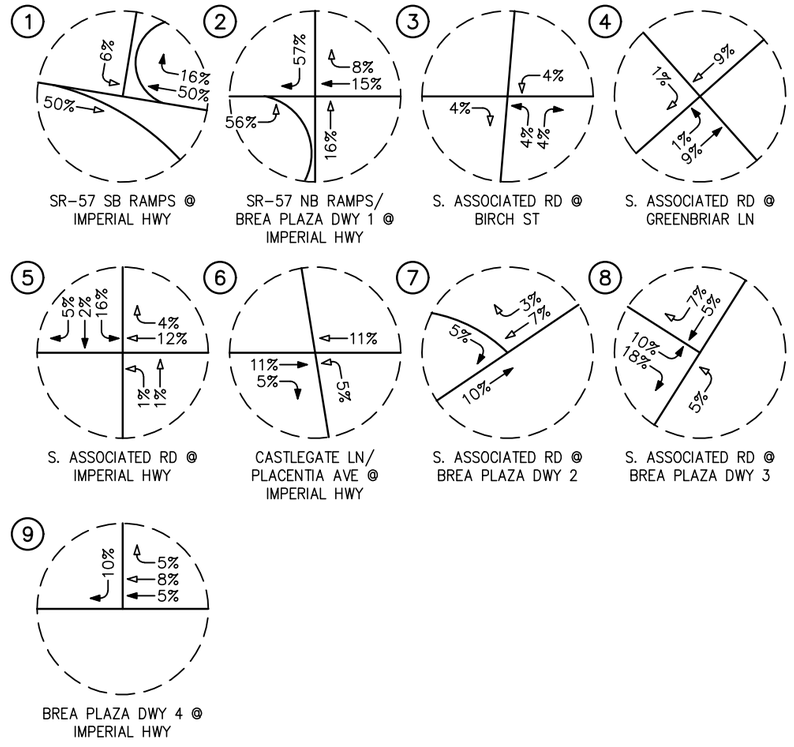
- Weekday Daily: Ln(T) = 0.68Ln(X) + 5.57
- Weekday AM Peak Hour: T = 0.50(X) + 151.78
- Weekday PM Peak Hour: Ln(T) = 0.74Ln(X) + 2.89
- Saturday Daily: Ln(T) = 0.62Ln(X) + 6.24
- Saturday Peak Hour of Generator: Ln(T) = 0.79Ln(X) + 2.79

8 Pass-By Trips are trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on adjacent streets, which contain direct access to the generator. For this analysis, the following pass-by reduction factors were used (Source: *Trip Generation Handbook,3rd Edition*, ITE 2017):

- 820: Shopping Center: PM Peak Hour – 34%, Daily/AM peak hour/Saturday Daily/Saturday Midday Peak Hour – Assume 10%

9 Consistent with the *Trip Generation Handbook,* published by ITE (2017), Project trip generation was adjusted to account for internal capture between the retail and residential components of the Project. As there are no Saturday internal capture worksheets available, Weekday Daily and Weekday PM peak hour calculations have been applied to Saturday Daily and Saturday Midday peak hour.





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N NO SCALE

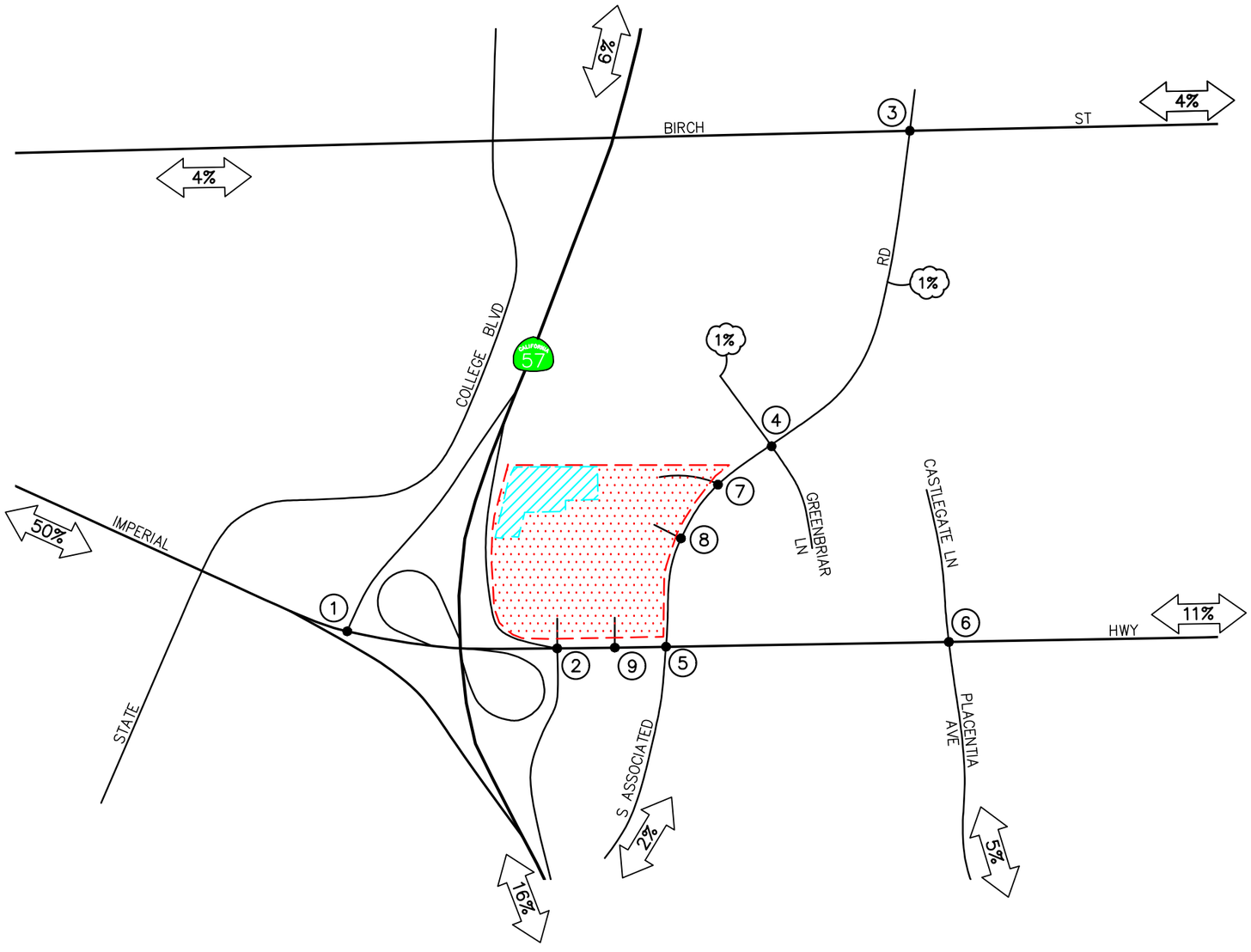
KEY

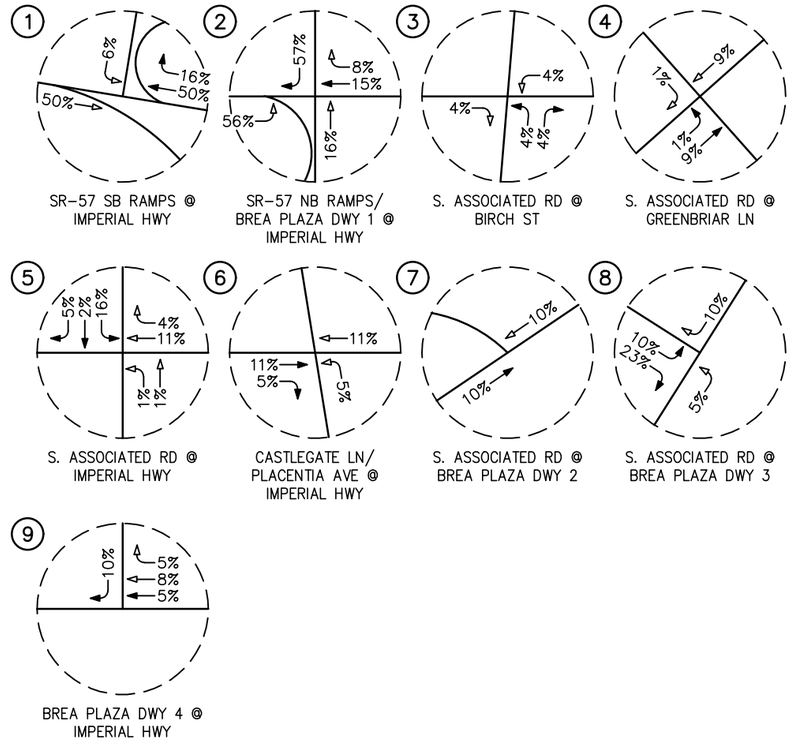
(#) = STUDY INTERSECTION
← = INBOUND PERCENTAGE
← = OUTBOUND PERCENTAGE
= BREA PLAZA
= PROJECT AREA

FIGURE 5-1

PROJECT TRAFFIC DISTRIBUTION PATTERN – EXISTING RETAIL

BREA PLAZA EXPANSION PROJECT, BREA





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KEY

(#) = STUDY INTERSECTION
← = INBOUND PERCENTAGE
← = OUTBOUND PERCENTAGE
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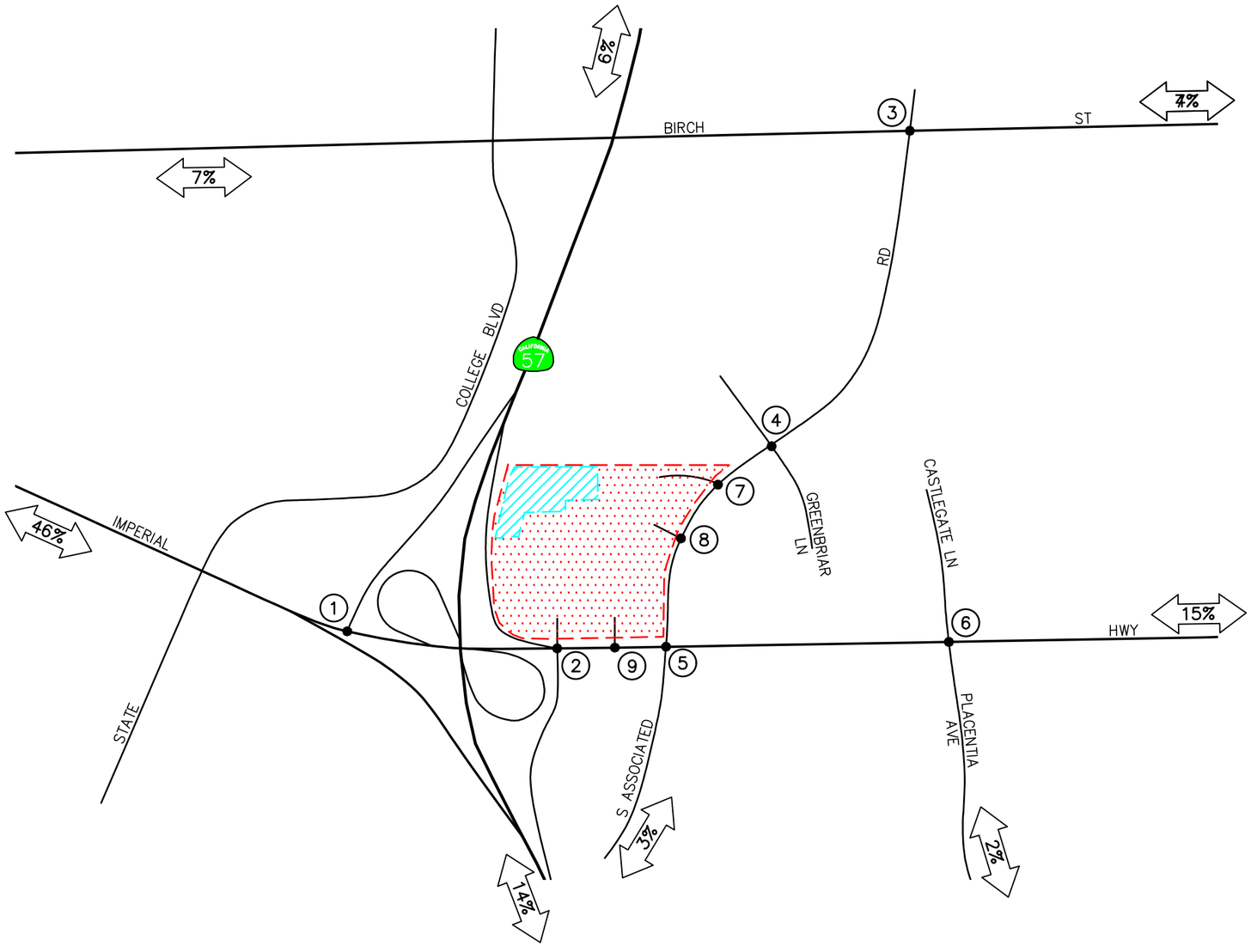
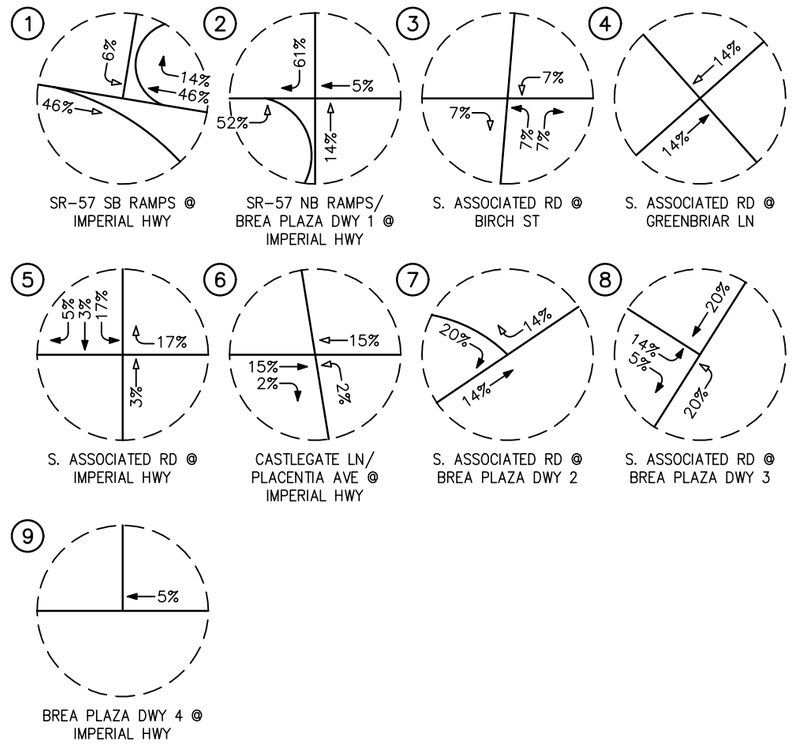
= PROJECT AREA

FIGURE 5-2

PROJECT TRAFFIC DISTRIBUTION PATTERN – PROPOSED RETAIL

BREA PLAZA EXPANSION PROJECT, BREA





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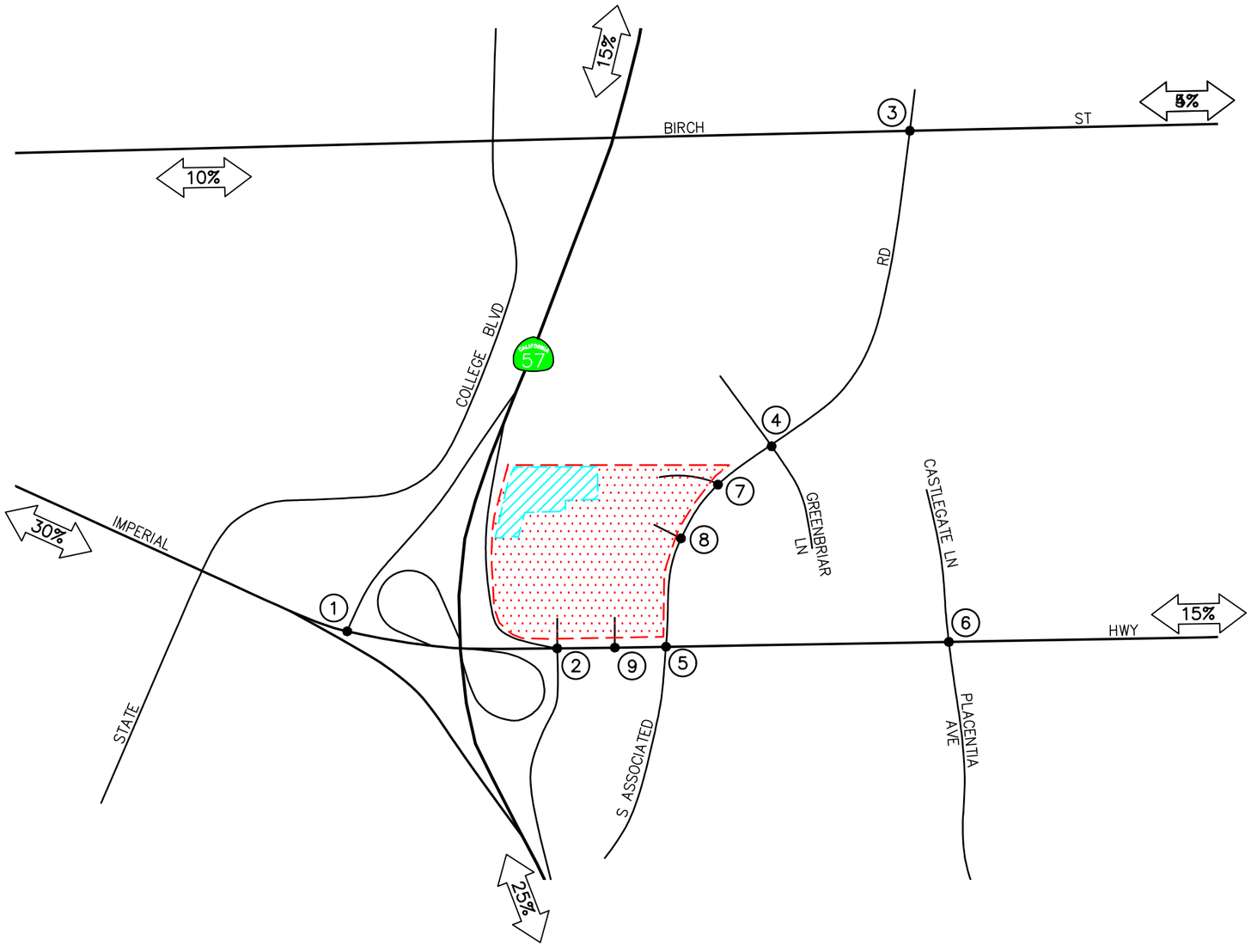
KEY

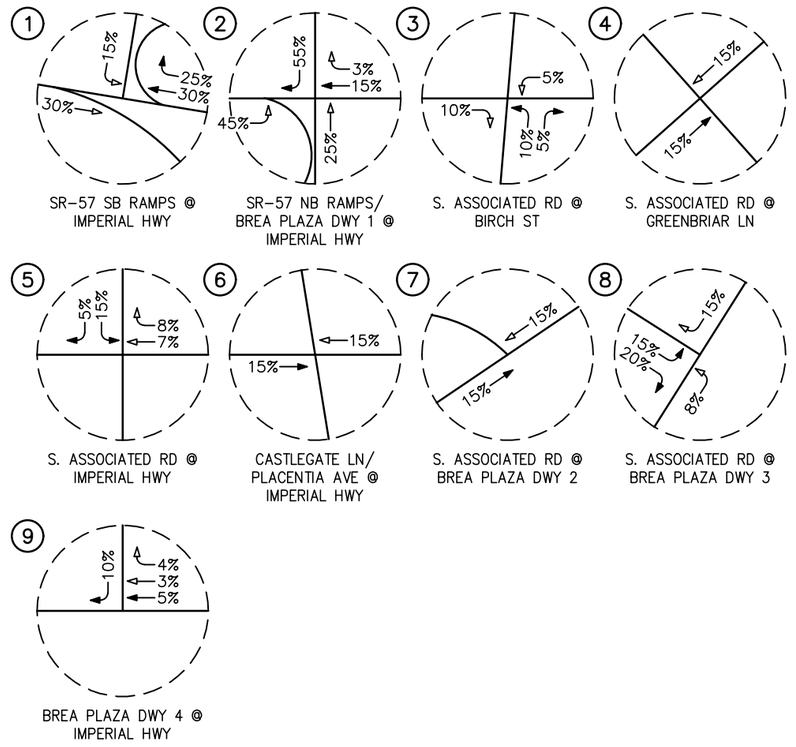
- (#) = STUDY INTERSECTION
- ⟵ = INBOUND PERCENTAGE
- ⟵ = OUTBOUND PERCENTAGE
- = BREA PLAZA
- = PROJECT AREA

FIGURE 5-3

PROJECT TRAFFIC DISTRIBUTION PATTERN – RESIDENTIAL

BREA PLAZA EXPANSION PROJECT, BREA





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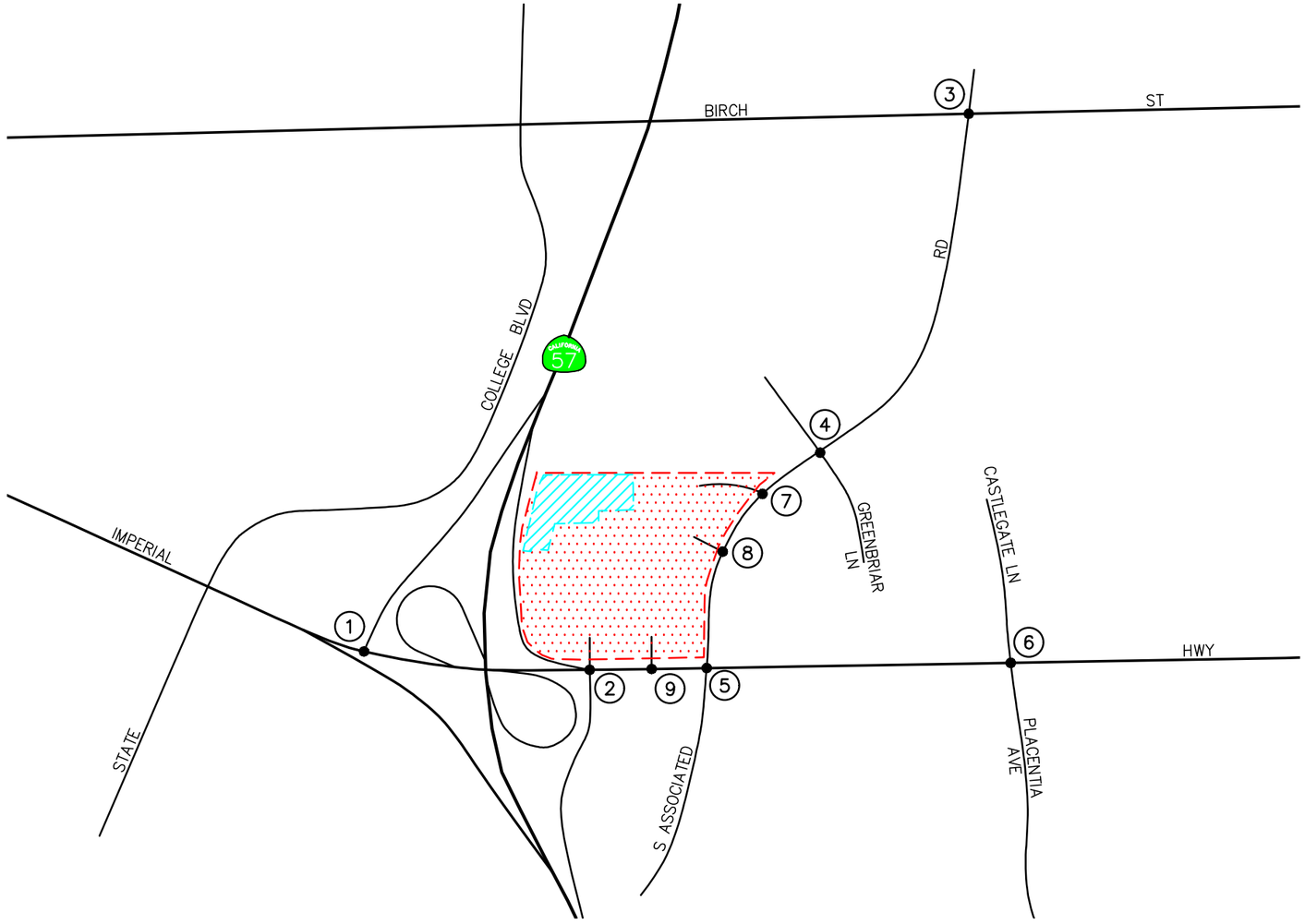
KEY

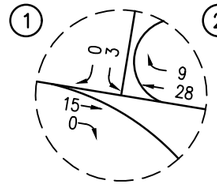
(#) = STUDY INTERSECTION
← = INBOUND PERCENTAGE
← = OUTBOUND PERCENTAGE
= BREA PLAZA
= PROJECT AREA

FIGURE 5-4

PROJECT TRAFFIC DISTRIBUTION PATTERN – OFFICE

BREA PLAZA EXPANSION PROJECT, BREA





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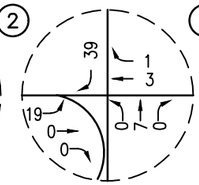
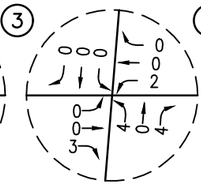
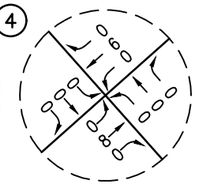
IMPERIAL HWY



SR-57 NB RAMPS/
BREA PLAZA DWY 1 @
IMPERIAL HWY



S. ASSOCIATED RD @
BIRCH ST



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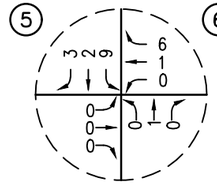
GREENBRIAR LN



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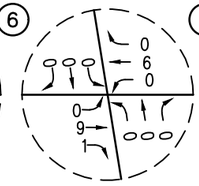
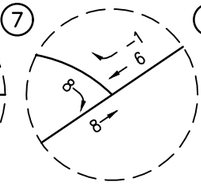
IMPERIAL HWY



CASTLEGATE LN/
PLACENTIA AVE @
IMPERIAL HWY



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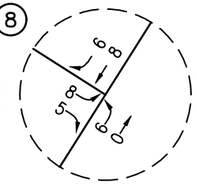

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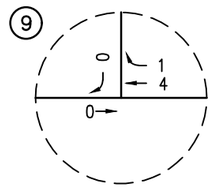

BREA PLAZA DWY 4 @
IMPERIAL HWY

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N NO SCALE

KEY

(#) = STUDY INTERSECTION

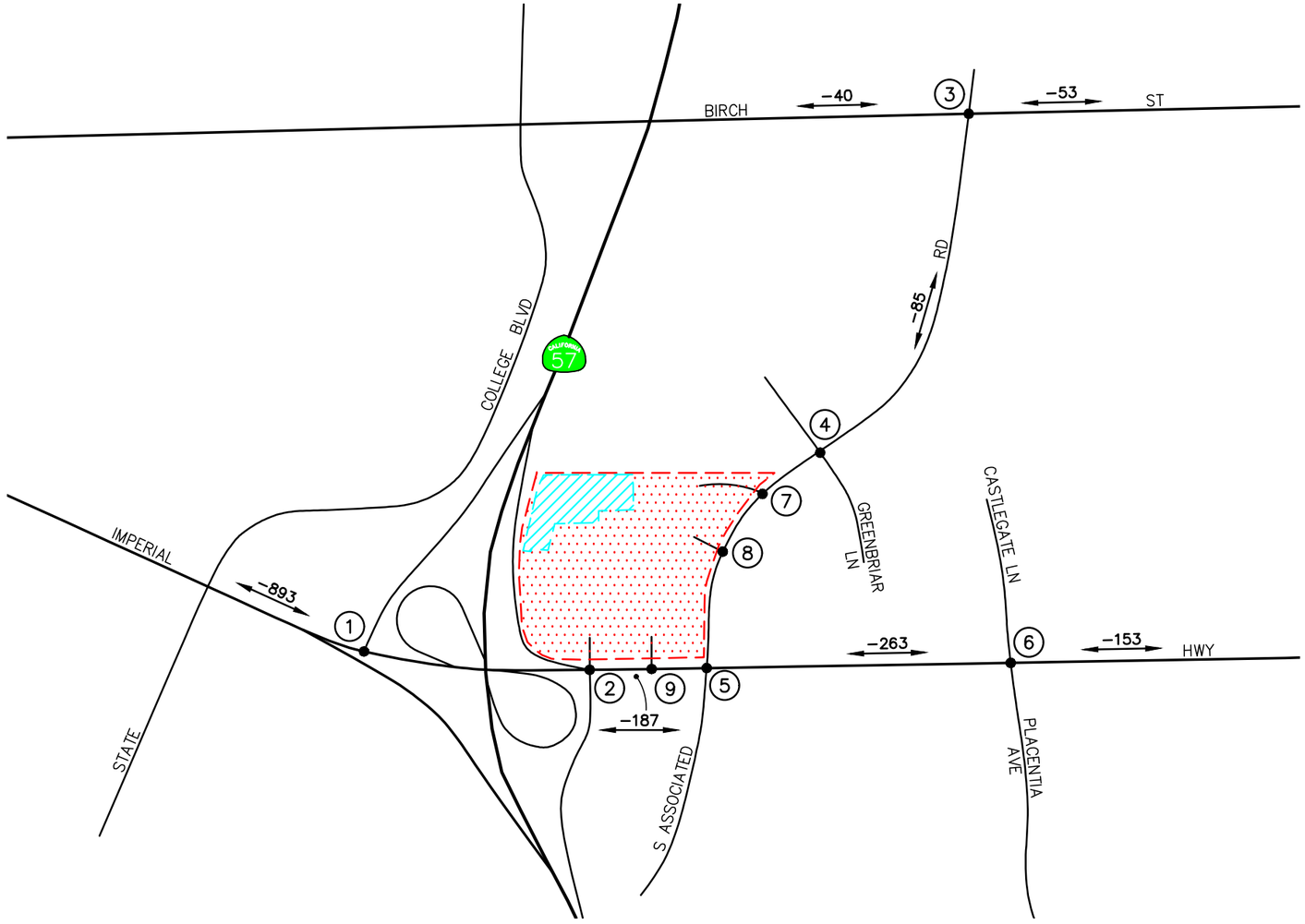
= BREA PLAZA

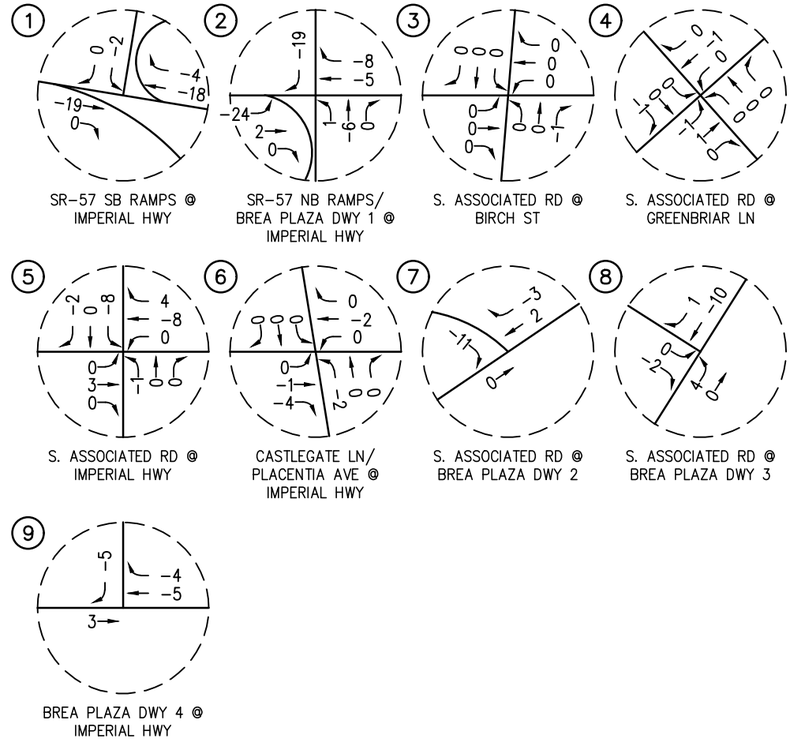
= PROJECT AREA

FIGURE 5-5

AM PEAK HOUR PROJECT TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA





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N NO SCALE

KEY

(#) = STUDY INTERSECTION
X,XXX = DAILY TRAFFIC VOLUMES
= BREA PLAZA
= PROJECT AREA

FIGURE 5-6

PM PEAK HOUR PROJECT AND DAILY TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Ambient Traffic Growth

Horizon year, background traffic growth estimates have been calculated using an ambient traffic growth factor. The ambient traffic growth factor is intended to include unknown and future related projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The future growth in traffic volumes has been calculated at one percent (1.0%) per year. Applied to the Year 2021 existing traffic volumes, this factor results in a 3.0% growth in existing volumes to the near-term horizon year 2024.

6.2 Related Projects Traffic Characteristics

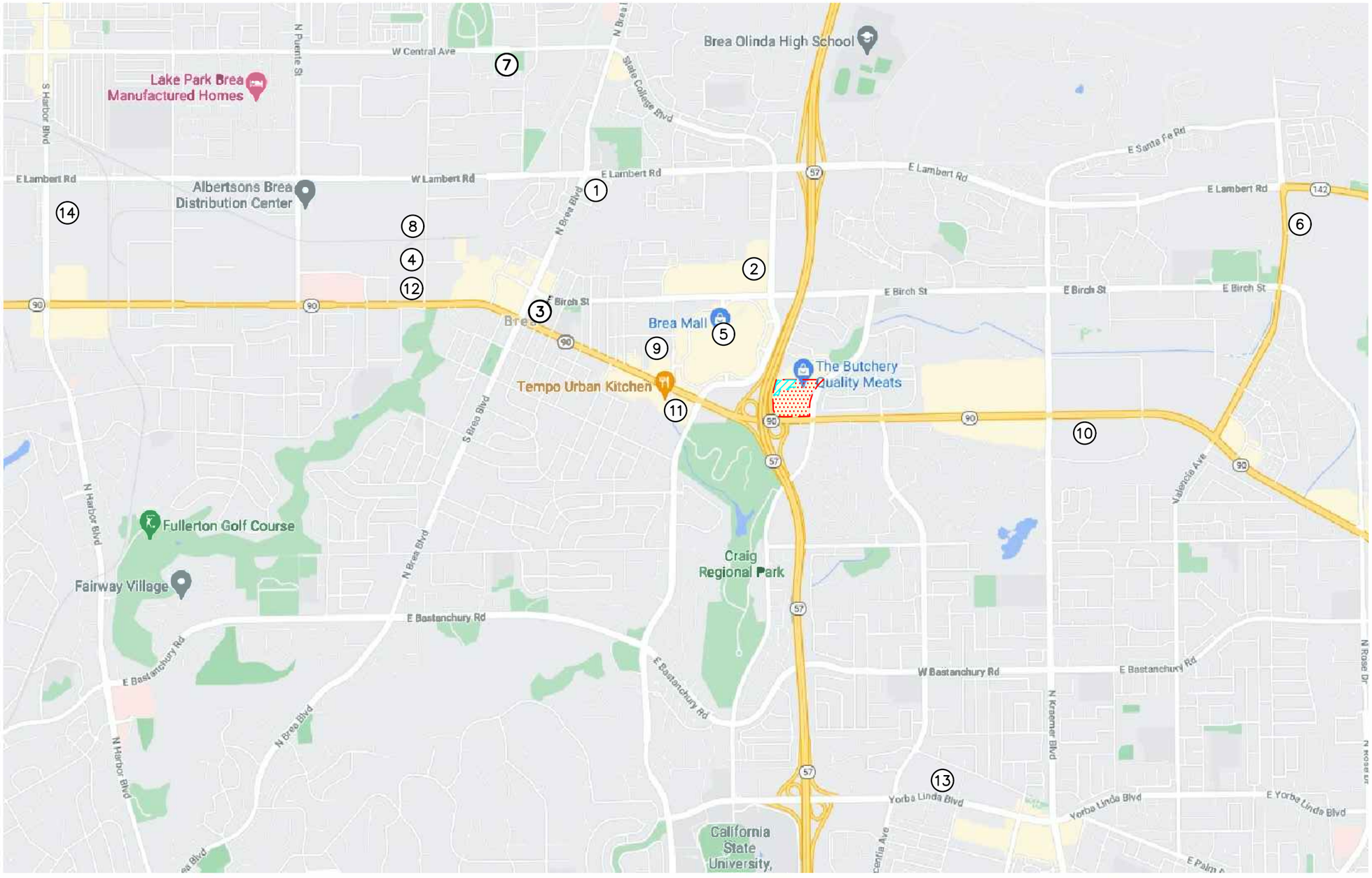
In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed Project, the status of other known development projects (related projects) within the area of the proposed project has been researched at the Cities of Brea, Placentia, and Fullerton. With this information, the proposed Project can be evaluated within the context of the cumulative setting.

Based on our research during the scoping process, there are twelve (12) related projects in the City of Brea and two (2) related projects in the City of Fullerton that are being processed for approval. All of these related projects have been included as part of the cumulative background setting.

Table 6-1 provides a brief description for each of the fourteen (14) related projects. ***Figure 6-1*** graphically illustrates the location of the fourteen (14) related projects. These related projects are expected to generate vehicular traffic, which may affect the operating conditions of the study intersections.

Table 6-2 summarizes the trip generation potential for the fourteen (14) related projects on a weekday daily and peak hour basis. As shown, the related projects are expected to generate 35,920 weekday daily trips, with 2,713 trips (1,312 inbound, 1,401 outbound) anticipated during the AM peak hour and 3,274 trips (1,709 inbound, 1,565 outbound) produced during the PM peak hour.

The weekday AM and PM peak hour traffic volumes associated with thirteen (13) of the fourteen (14) related projects in the Year 2024 are presented in ***Figures 6-2*** and ***6-3***, respectively. *Figure 6-3* also presents the weekday daily related project traffic volumes. It should be noted that the Brea 265 Specific Plan Project has been included as a related project only under Year 2045 background traffic conditions.



KEY

1. CVS
2. BREA PLACE
3. DOWNTOWN HOTEL
4. MERCURY APARTMENTS
5. BREA MALL MIXED-USE PROJECT
6. BREA 265 SPECIFIC PLAN
7. CENTRAL PARK VILLAGE
8. NEW INDUSTRIAL BUILDING
9. ALVERO ASSISTED LIVING
10. EXTRA SPACE SELF STRORAGE
11. BREA IMPERIAL CENTER
12. TRANWESTERN
13. 3105 YORBA LINDA BOULEVARD
14. BECKMAN BUSINESS CENTER

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N NO SCALE

SOURCE: GOOGLE

KEY

(#) = STUDY INTERSECTION
= BREA PLAZA
= PROJECT AREA

FIGURE 6-1

LOCATION OF CUMULATIVE PROJECTS
BREA PLAZA EXPANSION PROJECT, BREA

TABLE 6-1

LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[10]

No.	Description	Location/Address	Size
City of Brea			
1.	CVS	390 N. Brea Boulevard	13,000 SF Pharmacy with Drive-Through, 1,700 SF Coffee Shop with Drive-through
2.	Brea Place	State College Boulevard at Birch Street	653 DU Apartments, 5,000 SF Office, 150 Room Hotel[11]
3.	Downtown Hotel	220 S. Brea Boulevard	116 Room Hotel, 4,000 SF High Turnover Sit Down Restaurant
4.	Mercury Apartments	Southwest corner of Berry Street at Mercury Lane	120 DU Apartments
5.	Brea Mall Mixed-Use Project	1065 Brea Mall	Demolish existing 161,990 SF Sears department store and develop 183,615 SF retail space inclusive of a 50,019 SF sporting goods store and a 128,000 SF health club, and a 312 DU apartment building
6.	Brea 265 Specific Plan[12]	South of Lambert Road/Carbon Canyon Road, north of Rose Drive, east of Valencia Avenue and west of Carbon Canyon Regional Park	1,100 residential units, consisting of 606 single-family homes and 494 multi-family residential units.
7.	Central Park Village	340-420 W. Central Avenue	62 DU townhomes and 20 DU apartments[13]
8.	New Industrial Building	201 N. Berry Street	108,125 SF warehouse
9.	Alvero Assisted Living	251 S. Randolph Avenue	80 rooms with 82 beds residential care facility
10.	Extra Space Self Storage	2700 E. Imperial Highway	126,546 self-storage facility
11.	Brea Imperial Center	391 S. State College Boulevard	5,000 SF restaurant, 2,300 SF bagel/coffee shop, 1,600 SF café, 3,867 SF In-N-Out, 28,145 SF retail, and 4,400 SF bank to replace existing land uses which include 4,050 SF food uses, 24,481 SF retail, 4,400 SF bank, 2,325 SF medical office, 10,074 SF health studio spa.
12.	Transwestern	285 S. Berry Street and 711 W. Imperial Highway	132,700 SF warehouse
City of Fullerton			
13.	3105 Yorba Linda Boulevard	3105 Yorba Linda Boulevard	4,840 SF drive-through car wash
14.	Beckman Business Center	4300 North Harbor Boulevard	522,250 SF Warehousing, 166,185 SF General Light Industrial, 105,880 SF Manufacturing, 42,000 SF Office, and 142,350 SF fulfillment center

[10] Source: City of Brea and Fullerton Planning Departments.

[11] The traffic impact analysis conservatively evaluated 790 units as originally planned, which would result in higher traffic volumes in the cumulative scenarios.

[12] Brea 265 Specific Plan Project has been included as a related project as part of Year 2045 General Plan Buildout background traffic conditions.

[13] The project has already built and occupied 206 DU apartments and 83 DU townhomes.

TABLE 6-2

CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[14]

Cumulative Project Description	Weekday Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
1. CVS	2,323	62	58	120	62	61	123
2. Brea Place	7,086	130	310	440	325	213	538
3. Downtown Hotel	1,257	47	36	83	46	39	85
4. Mercury Apartments	653	11	32	43	32	21	53
5. Brea Mall Mixed-Use Project[15]	4,140	165	150	315	281	143	424
6. Brea 265 Specific Plan[16,17]	9,337	164	512	676	552	325	877
7. Central Park Village	600	9	29	38	29	17	46
8. New Industrial Building	247	22	5	27	10	22	32
9. Alvero Assisted Living	213	10	6	16	8	13	21
10. Extra Space Self Storage	191	8	5	13	10	12	22
11. Brea Imperial Center	1,315	58	60	118	56	37	93
12. Transwestern	304	25	8	33	10	29	39
13. 3105 Yorba Linda Boulevard	690	18	18	36	35	34	69
14. Beckman Business Center[18]	7,564	583	172	755	253	599	852
Cumulative Projects Total Trip Generation Potential	**35,920**	**1,312**	**1,401**	**2,713**	**1,709**	**1,565**	**3,274**

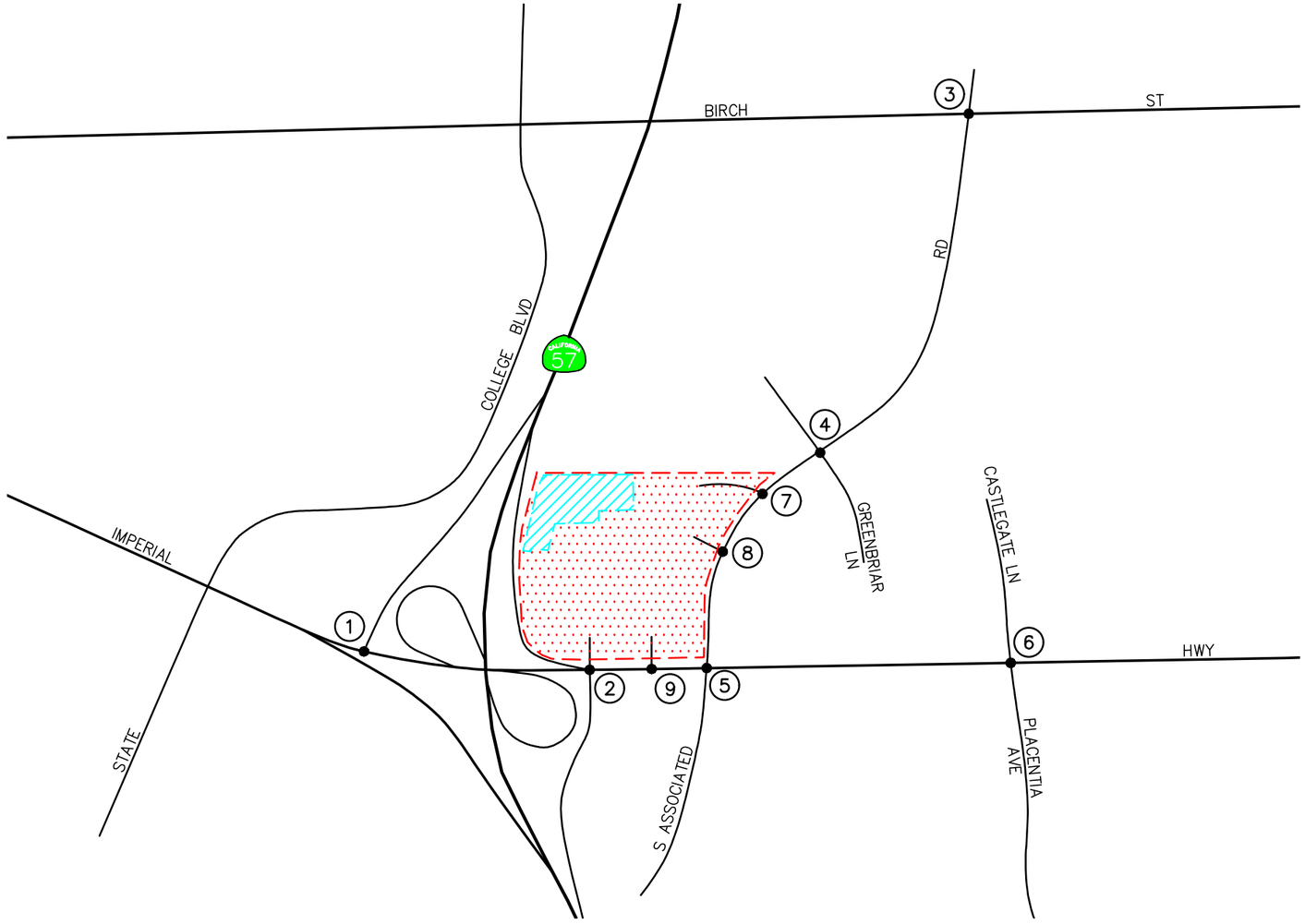
[14] Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).

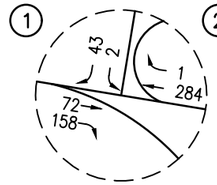
[15] Source: *Brea Mall Mixed-Use Project TIA*, prepared by LLG Engineers, dated January 2020.

[16] Source: *Brea 265 Specific Plan TIA*, prepared by LLG Engineers, dated October 2019.

[17] Brea 265 Specific Plan Project has been included as a related project as part of Year 2045 General Plan Buildout background traffic conditions.

[18] Source: *Beckman Business Center Proposed Building 6 Tenant/Land Use Modification TIA Report Addendum,* prepared by LLG Engineers, dated September 2019. Although this development is completely constructed, it was only partially occupied during the time the existing traffic counts were collected. Hence to provide a conservative assessment, all buildings are assumed to be vacant.





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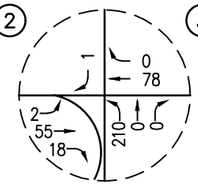

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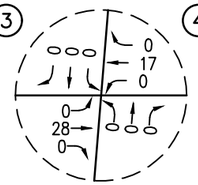

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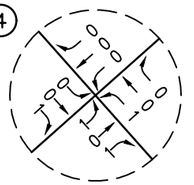

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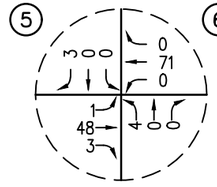

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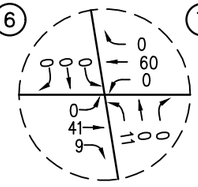

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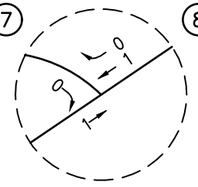

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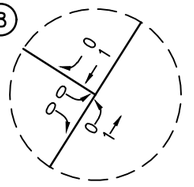

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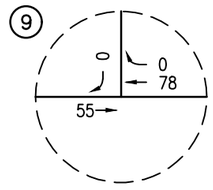

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

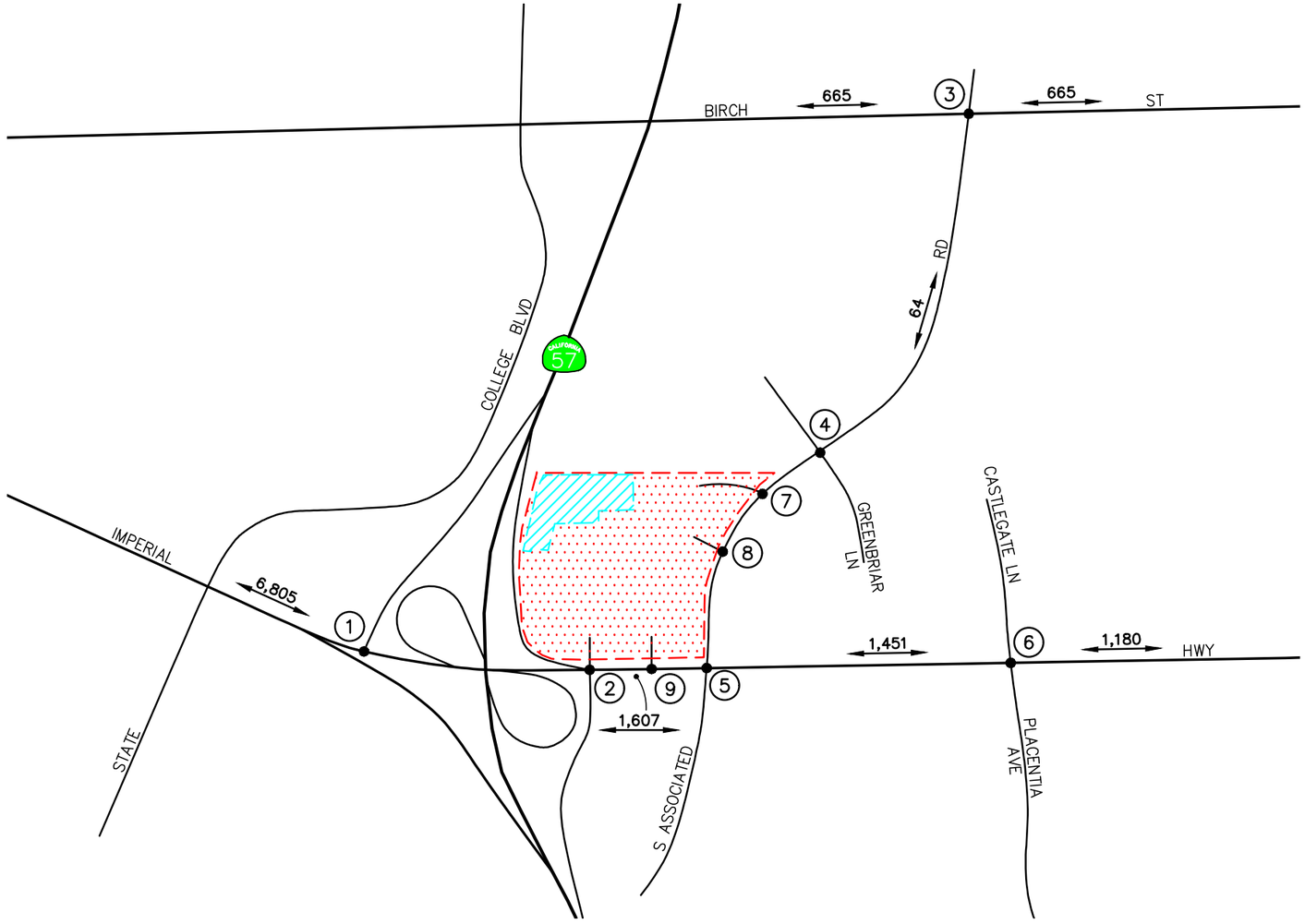
= BREA PLAZA

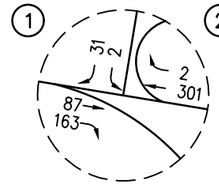
= PROJECT AREA

FIGURE 6-2

AM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA





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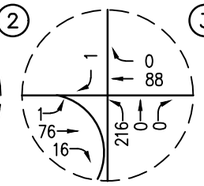

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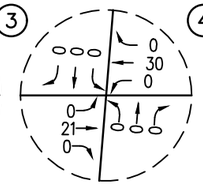

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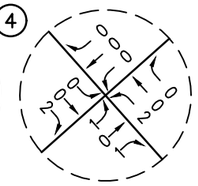

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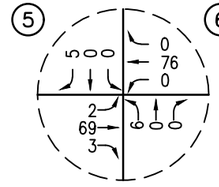

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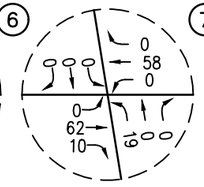

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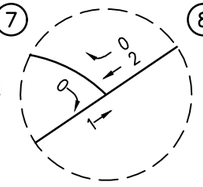

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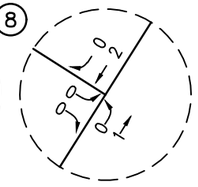

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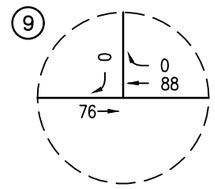

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION
X,XXX = DAILY TRAFFIC VOLUMES
= BREA PLAZA
= PROJECT AREA

FIGURE 6-3

PM PEAK HOUR AND DAILY CUMULATIVE PROJECTS TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA

6.3 Year 2045 General Plan Buildout Traffic Conditions

As coordinated with City staff, the Year 2045 General Plan Buildout traffic volume forecasts for this traffic study were developed via the utilization of the OCTAM 5.0 Year 2045 traffic model. Specifically, daily, AM peak period and PM peak period link traffic volumes were provided for the existing base year (i.e. Year 2016) and for the Year 2045. The AM peak period corresponds to a three-hour morning commute period while the PM peak period corresponds to a four-hour afternoon commute period. Using the peak period model runs and the approved peak hour factors (i.e. AM = 0.3566 and PM = 0.2662), the one-hour peak hour link traffic volumes were determined. These future year 2045 link traffic volumes were post-processed based on the relationship of the base year validation model run output to the base year ground traffic counts resulting in anticipated Year 2045 without project daily traffic volumes for the roadway segments and AM peak hour/PM peak hour turning movements for the study intersections.

Appendix E presents the post-processing worksheets.

6.4 Year 2024 and Year 2045 Traffic Volumes

6.4.1 *Year 2024 Traffic Volumes*

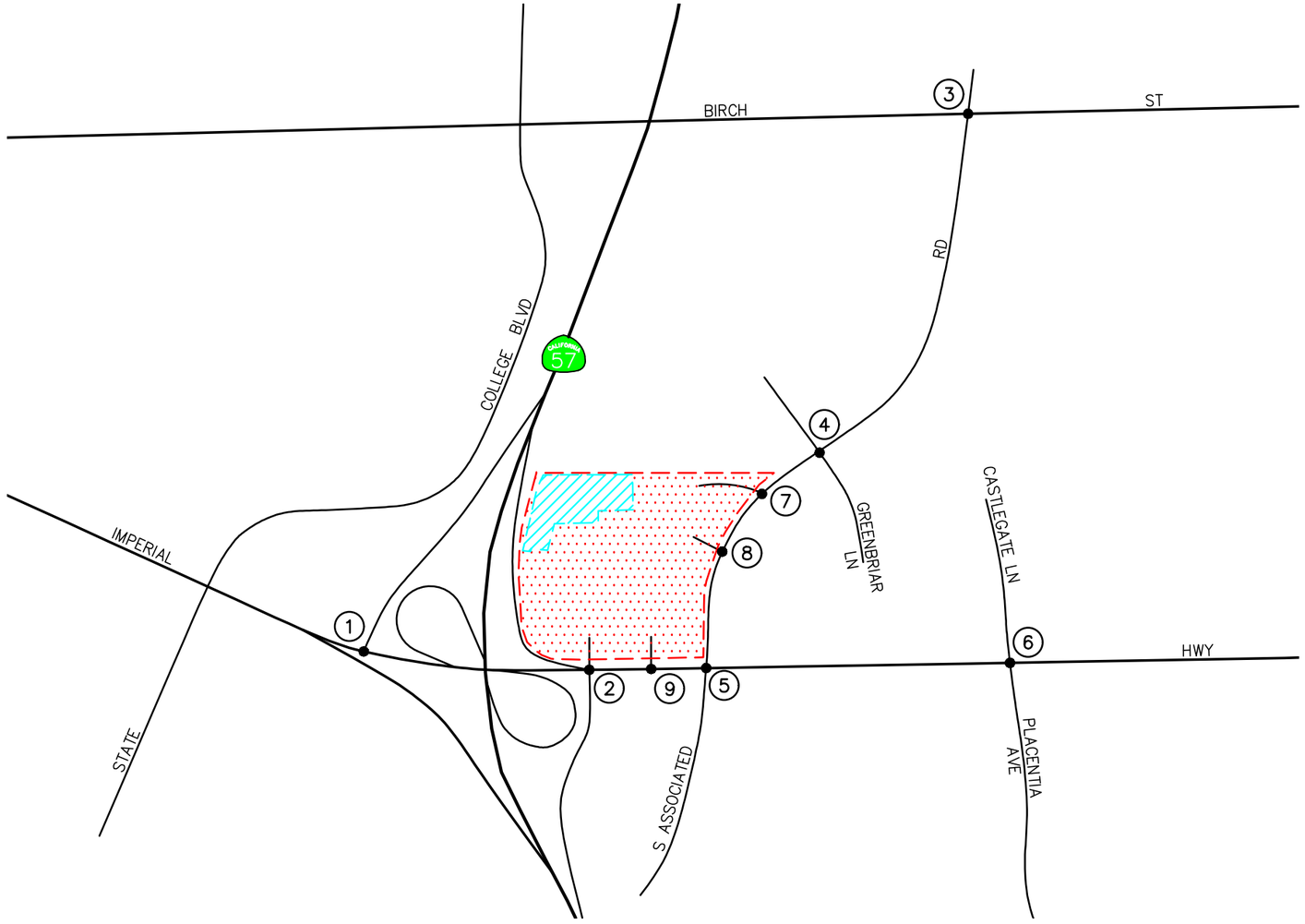
Figures 6-4 and ***6-5*** present the weekday AM and PM peak hour cumulative traffic volumes (existing traffic + ambient growth + related projects) at the nine (9) study intersections for the Year 2024, respectively. *Figure 6-5* also presents the Year 2024 daily cumulative traffic volumes.

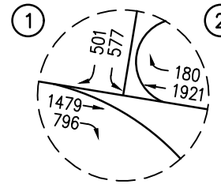
Figures 6-6 and ***6-7*** illustrate the Year 2024 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project, respectively. *Figure 6-7* also presents the Year 2024 daily cumulative plus project traffic volumes.

6.4.2 *Year 2045 General Plan Buildout Traffic Volumes*

Figures 6-8 and ***6-9*** present the anticipated Year 2045 General Plan Buildout AM and PM peak hour cumulative traffic volumes at the nine (9) study intersections, respectively. *Figure 6-9* also presents the Year 2045 daily cumulative traffic volumes.

Figures 6-10 and ***6-11*** illustrate the anticipated Year 2045 General Plan Buildout forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project, respectively. *Figure 6-11* also presents the Year 2045 daily cumulative plus project traffic volumes.





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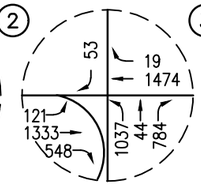

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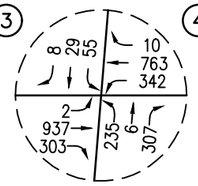

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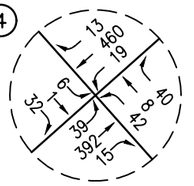

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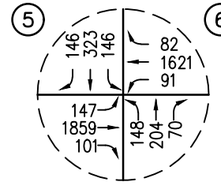

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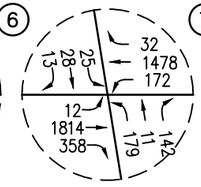

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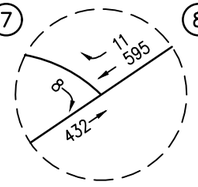

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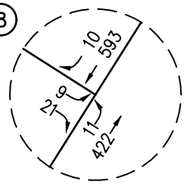

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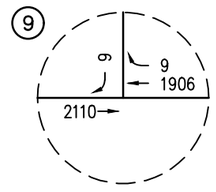

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

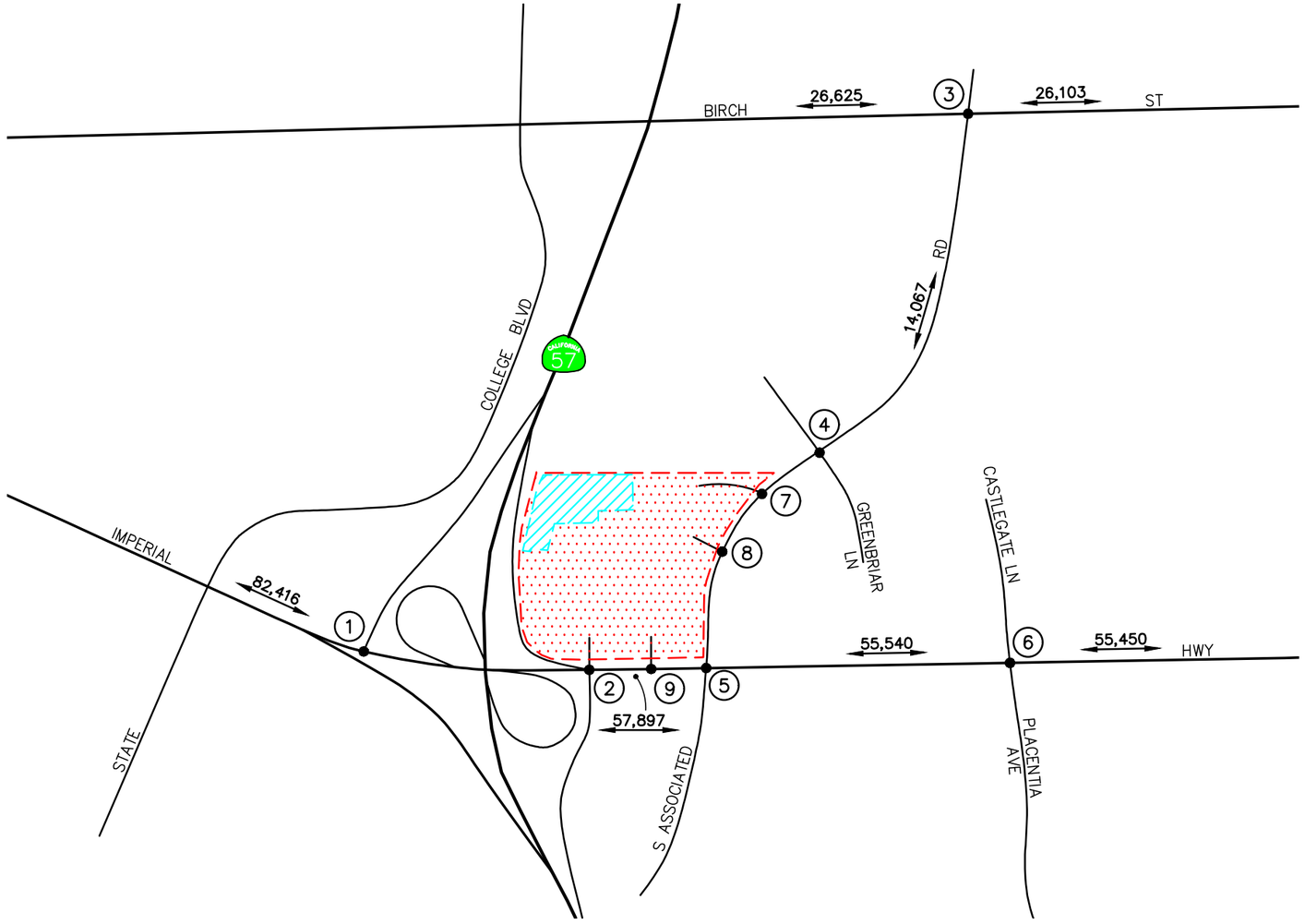
= BREA PLAZA

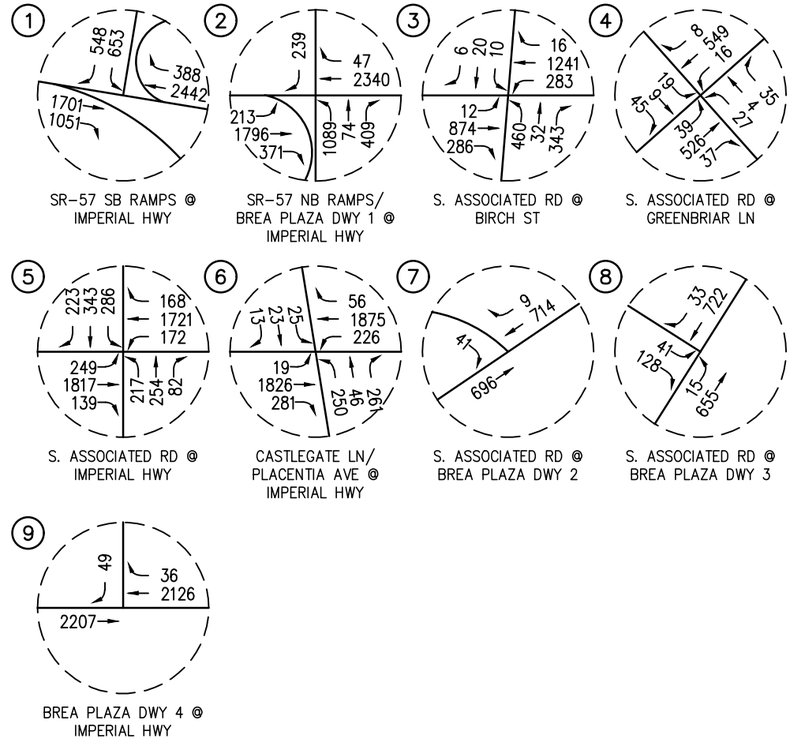
= PROJECT AREA

FIGURE 6-4

YEAR 2024 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA





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LINSCOTT LAW & GREENSPAN engineers

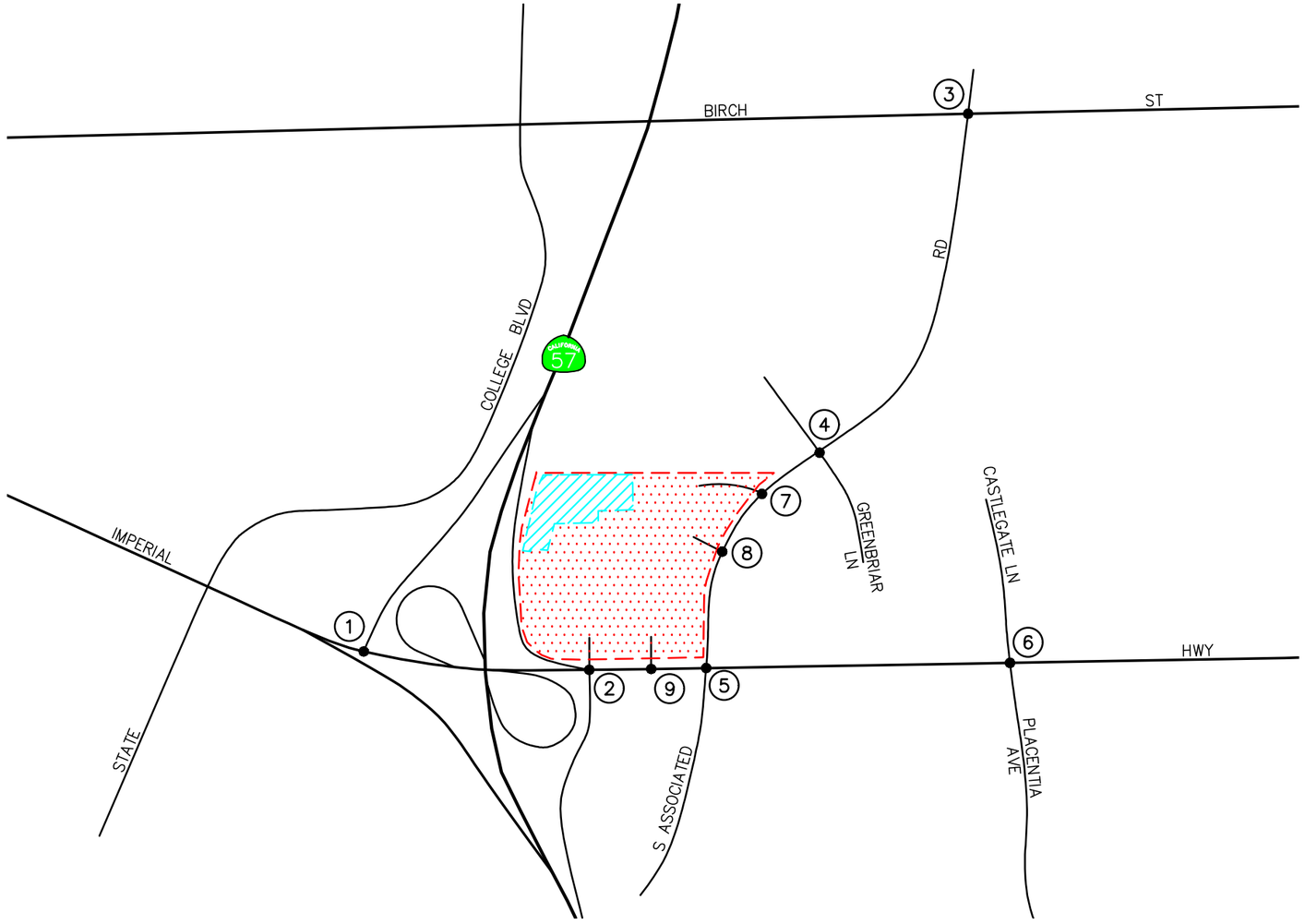
N NO SCALE

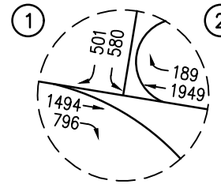
KEY

(#) = STUDY INTERSECTION
X,XXX = DAILY TRAFFIC VOLUMES
= BREA PLAZA
= PROJECT AREA

FIGURE 6-5

YEAR 2024 CUMULATIVE PM PEAK HOUR AND DAILY TRAFFIC VOLUMES
BREA PLAZA EXPANSION PROJECT, BREA





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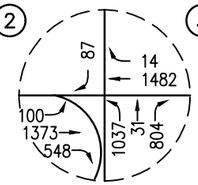

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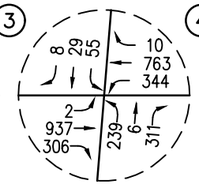

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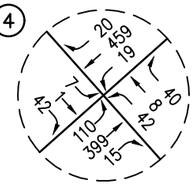

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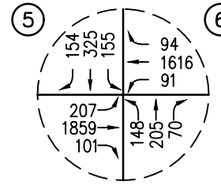

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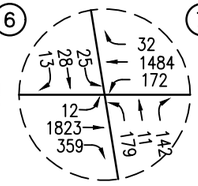

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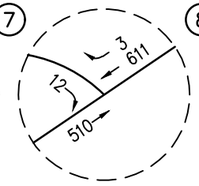

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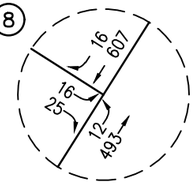

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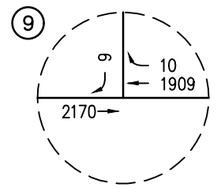

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IMPERIAL HWY

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

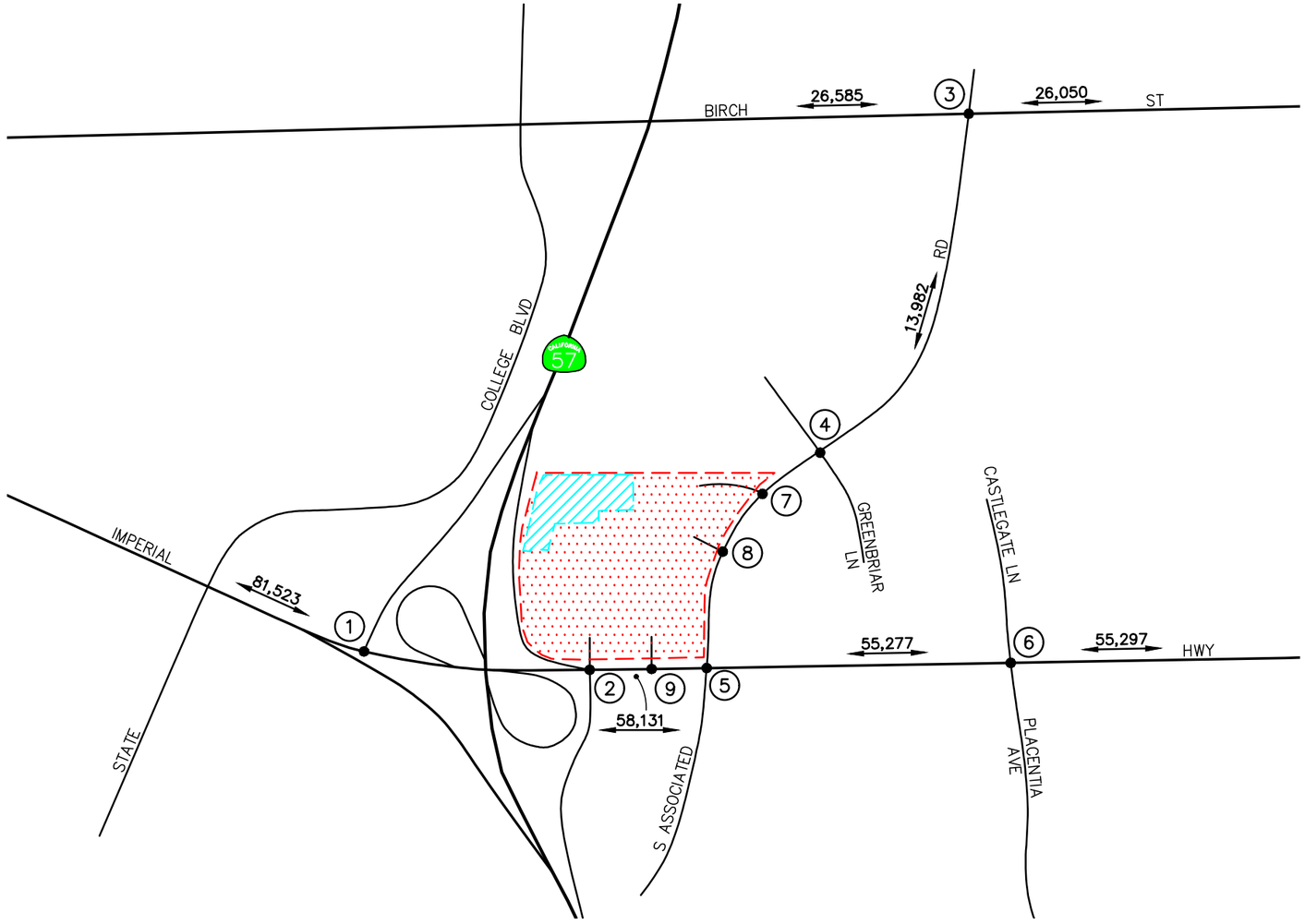
= BREA PLAZA

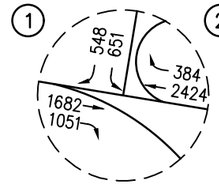
= PROJECT AREA

FIGURE 6-6

YEAR 2024 CUMULATIVE PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA





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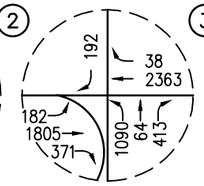

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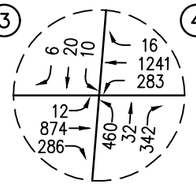

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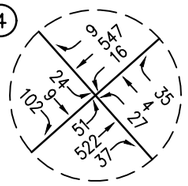

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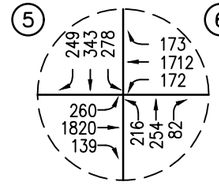

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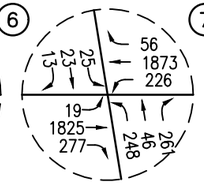

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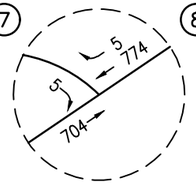
IMPERIAL HWY



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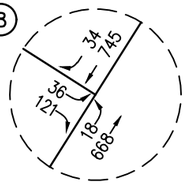

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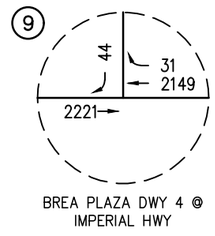

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

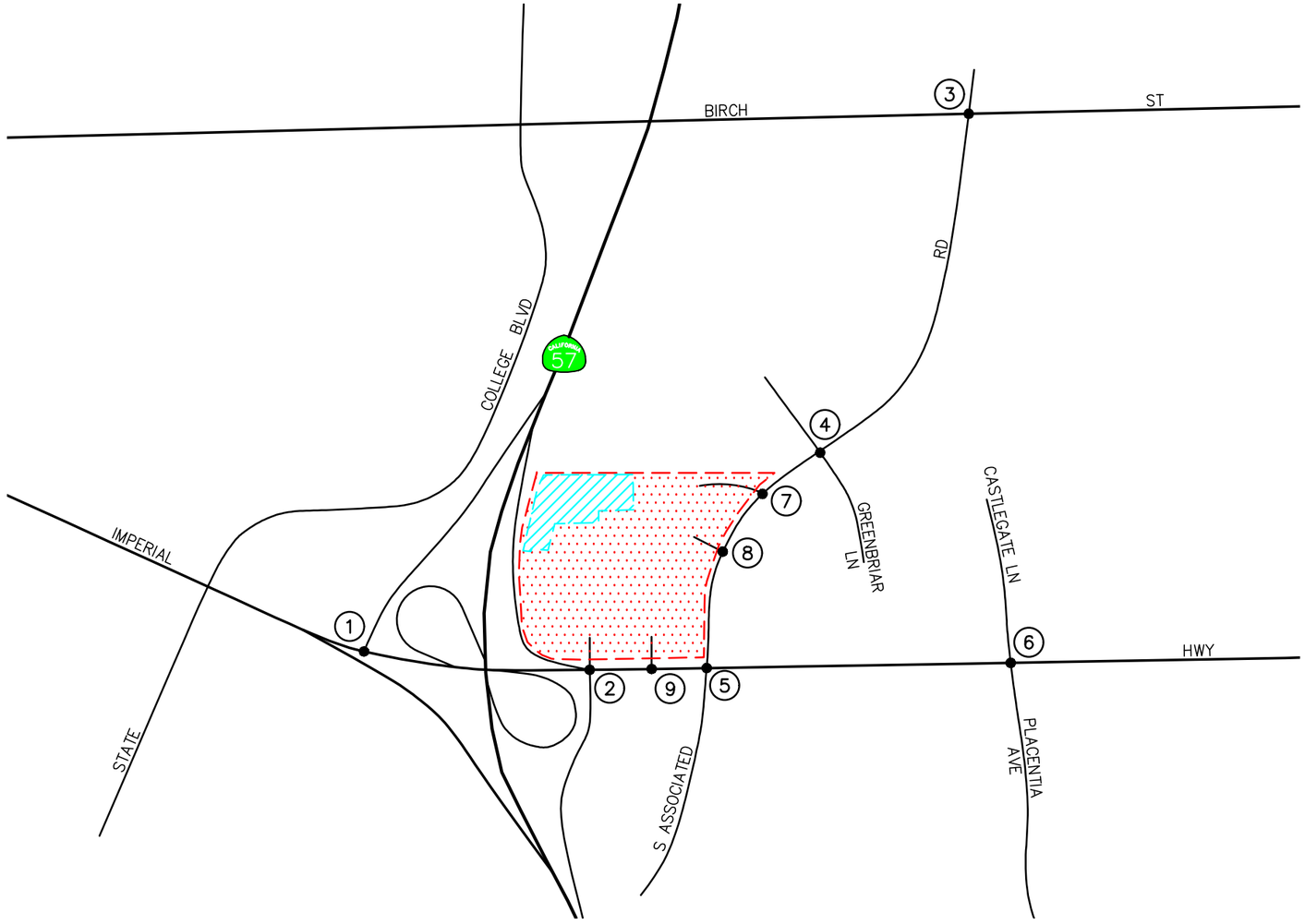
KEY

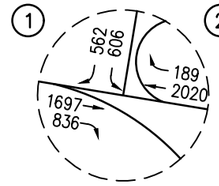
(#) = STUDY INTERSECTION
X,XXX = DAILY TRAFFIC VOLUMES
= BREA PLAZA
= PROJECT AREA

FIGURE 6-7

YEAR 2024 CUMULATIVE PLUS PROJECT PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA





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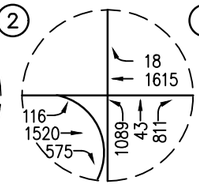

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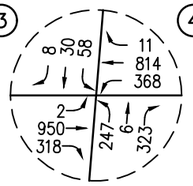

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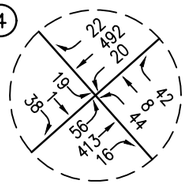

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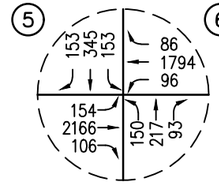

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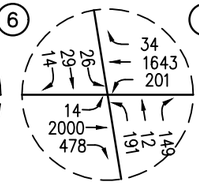

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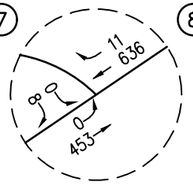

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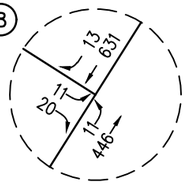

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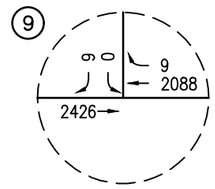

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

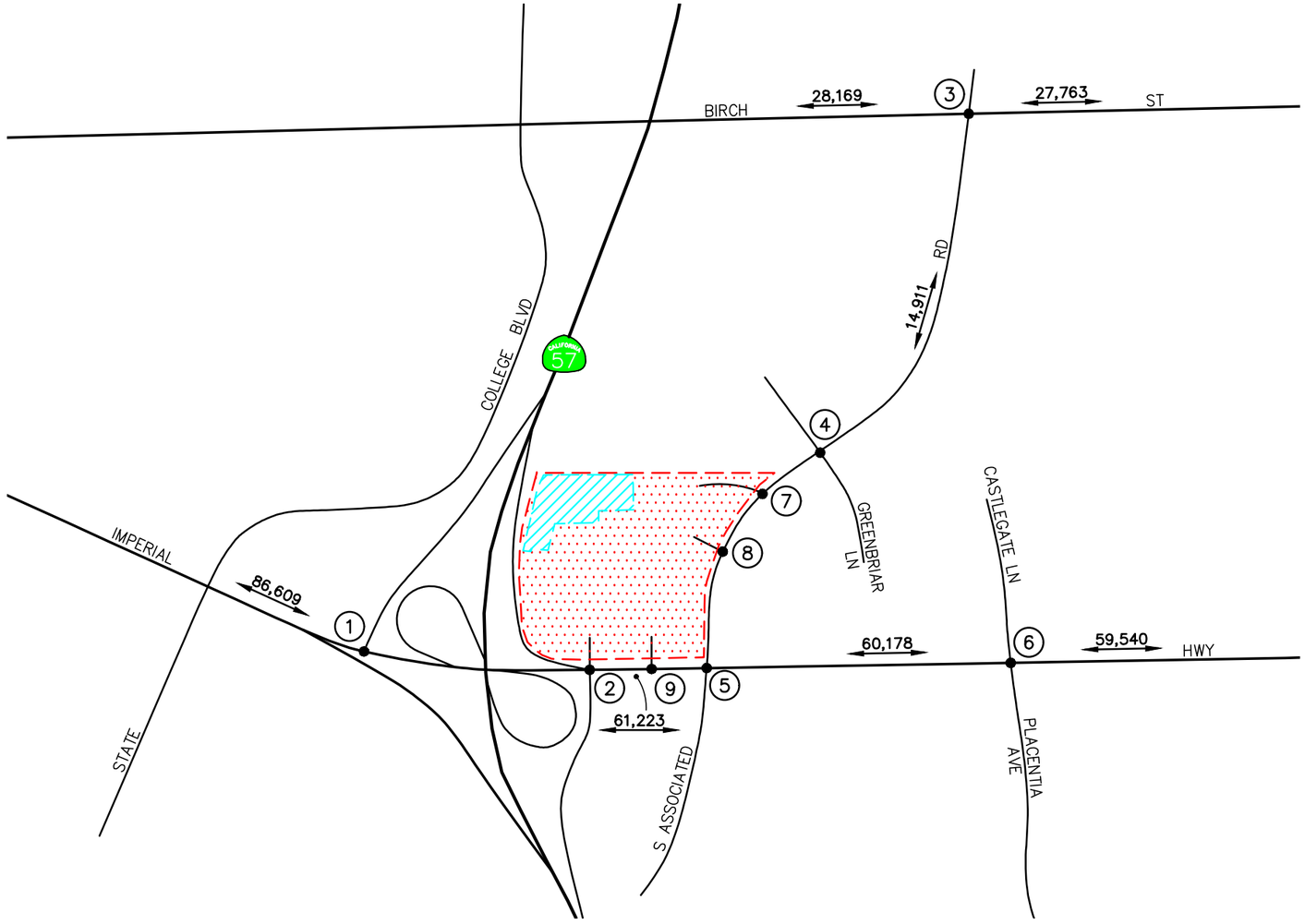
= BREA PLAZA

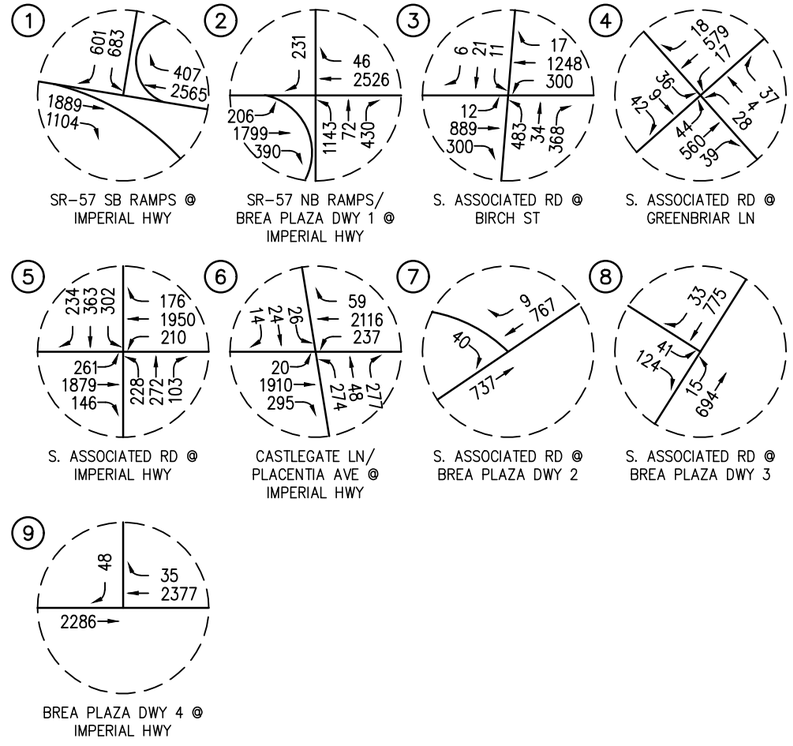
= PROJECT AREA

FIGURE 6-8

YEAR 2045 GENERAL PLAN BUILDOUT AM PEAK HOUR TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA





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LINSCOTT LAW & GREENSPAN engineers

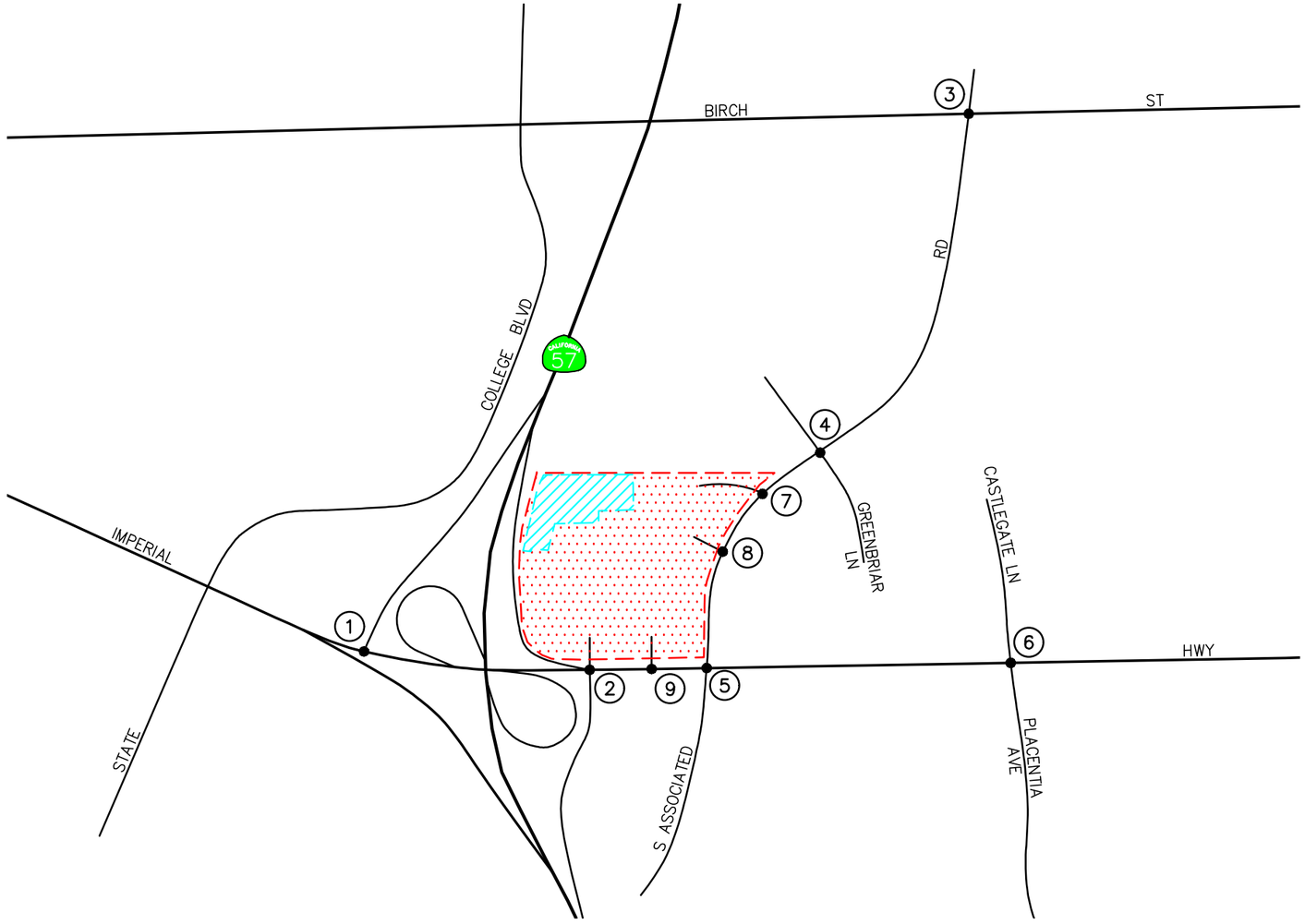
N NO SCALE

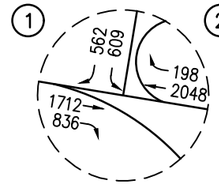
KEY

(#) = STUDY INTERSECTION
X,XXX = DAILY TRAFFIC VOLUMES
= BREA PLAZA
= PROJECT AREA

FIGURE 6-9

YEAR 2045 GENERAL PLAN BUILDOUT
PM PEAK HOUR AND DAILY TRAFFIC VOLUMES
BREA PLAZA EXPANSION PROJECT, BREA





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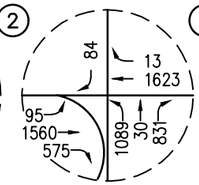

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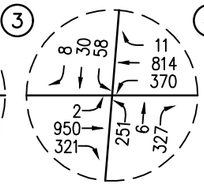

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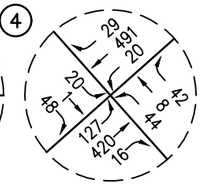

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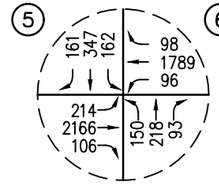

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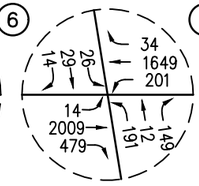

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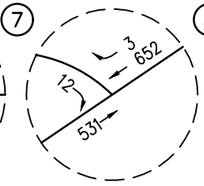

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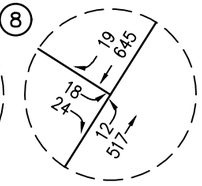

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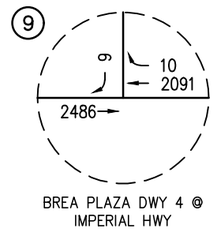

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

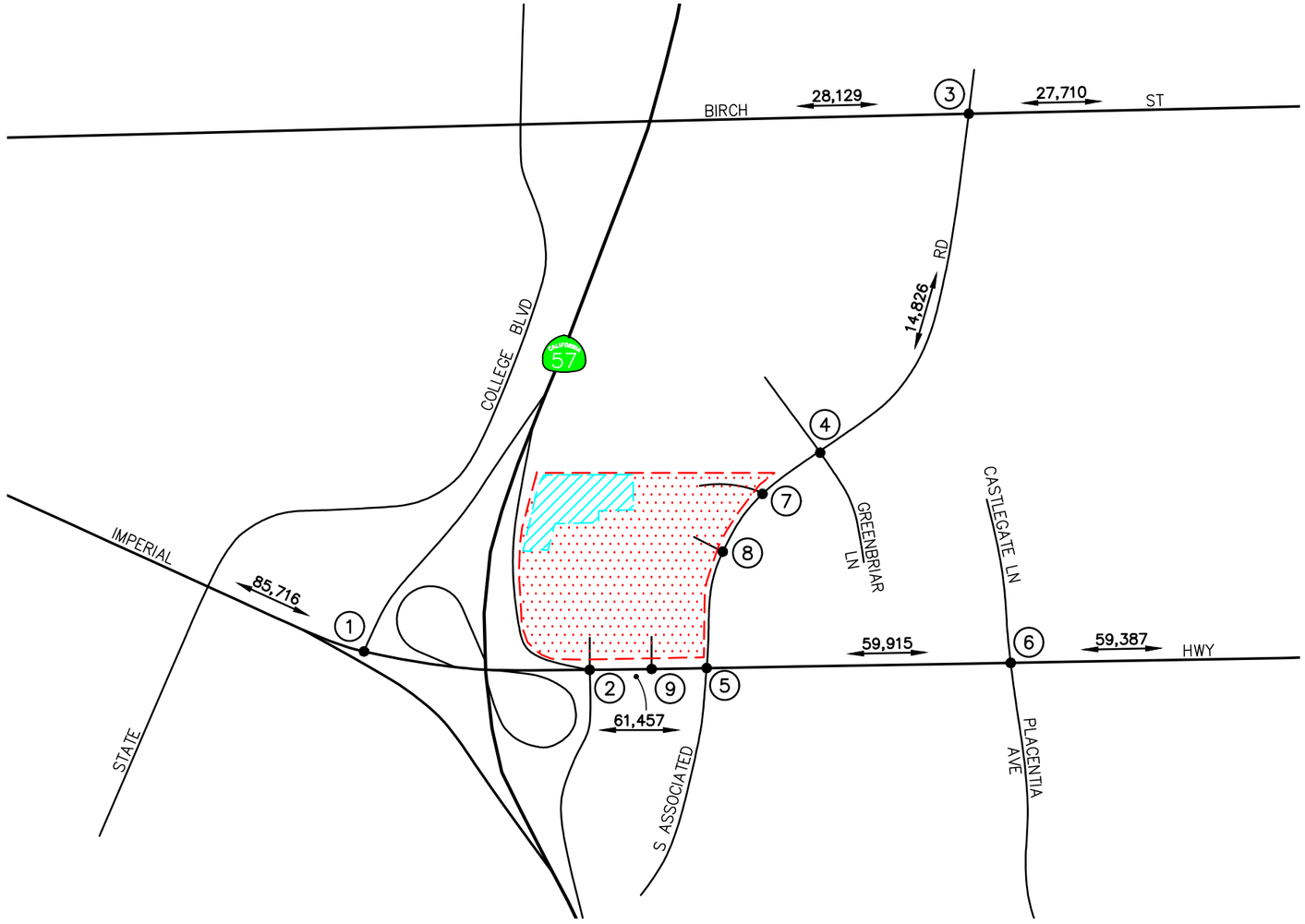
= BREA PLAZA

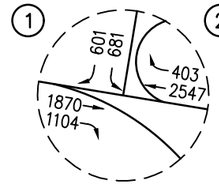
= PROJECT AREA

FIGURE 6-10

YEAR 2045 GENERAL PLAN BUILDOUT PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA





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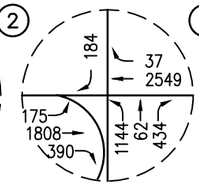

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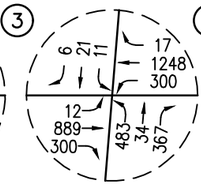

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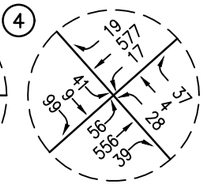

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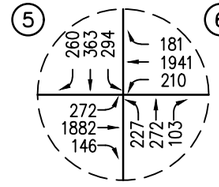

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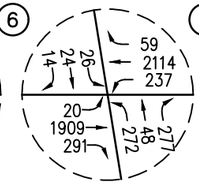

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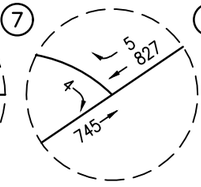

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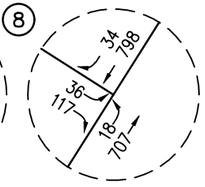

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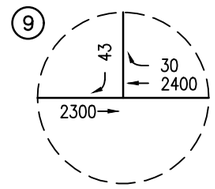

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION
X,XXX = DAILY TRAFFIC VOLUMES
= BREA PLAZA
= PROJECT AREA

FIGURE 6-11

YEAR 2045 GENERAL PLAN BUILDOUT PLUS PROJECT PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

BREA PLAZA EXPANSION PROJECT, BREA

7.0 TRAFFIC ANALYSIS METHODOLOGY

7.1 Level of Service Consequences and Thresholds

The potential LOS consequences of the added project traffic volumes generated by the proposed Project during the weekday peak hours was evaluated based on analysis of future operating conditions at the nine (9) study intersections, without, then with, the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and service level characteristics at each study intersection. The consequence of added project-related peak hour traffic on the LOS at each study intersection then evaluated using the following criteria.

7.1.1 *City of Brea*

For the ICU analysis, the need for potential Project-related improvements will be assessed based on the following criteria:

- The Project causes an intersection operating at LOS D or better to degrade to LOS E or F, or
- The Project increases traffic demand at a signalized study intersection by 0.020 or greater and the intersection is forecast to operate at LOS E or F.

For the HCM analysis, the need for potential Project-related improvements will be assessed based on the following criteria:

- The Project causes one or more study intersections operating at LOS D or better to degrade to LOS E or F, or
- The Project causes a change in control delay of 4 seconds for intersections already operating at LOS E, or
- The Project causes a change in control delay of 2 seconds for intersections already operating at LOS F.

7.2 Traffic Analysis Scenarios

The following scenarios are those for which volume/capacity calculations have been performed at the nine (9) study intersections for existing, near-term (Year 2024) and General Plan Buildout (Year 2045) traffic conditions:

1. Existing (Year 2021) Traffic Conditions;
2. Near-Term (Year 2024) Background Traffic Conditions (Existing plus Ambient Growth plus Related Projects);
3. Near-Term (Year 2024) Background Plus Project Traffic Conditions;
4. Scenario (3) with improvements to be implemented as conditions of approval (COA), if necessary;
5. General Plan Buildout[19] (Year 2045) Traffic Conditions;

[19] It should be noted that the General Plan Buildout assessment has been included since the proposed Project would require an amendment to the General Plan to accommodate a change is Zoning to allow for residential uses.

6. General Plan Buildout (Year 2045) Plus Project Traffic Conditions; and
7. Scenario (6) with improvements to be implemented as conditions of approval (COA), if necessary.

7.3 City of Brea Nexus Program

To satisfy the AB 1600 legislative requirement, development impact fees have been established for future traffic improvements within the City of Brea. Ensuring that every development project contributes a fair share of transportation improvements in the community, the City has introduced the "Transportation Improvement Nexus Program". In 2011, the Nexus Program was updated to reflect transportation needs and incorporate capacity improvements in an orderly fashion. The program ensures all future development with the City of Brea contributes on a fair share basis.

8.0 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

8.1 Year 2024 Traffic Conditions - ICU

Table 8-1 summarizes the peak hour Level of Service results at the six (6) signalized study intersections evaluated under ICU analysis for the Year 2024 horizon year. The first column (1) of ICU/LOS values in *Table 8-1* presents a summary of existing peak hour traffic conditions. The second column (2) lists projected cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2024 near-term traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in ICU value due to the added peak hour Project trips and indicates whether the traffic associated with the proposed Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.1.1 *Year 2024 Cumulative Traffic Conditions - ICU*

Review of column (2) of *Table 8-1* indicates that all of the signalized study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours under Year 2024 cumulative traffic conditions.

8.1.2 *Year 2024 Cumulative Plus Project Conditions - ICU*

Review of columns (3) and (4) of *Table 8-1* indicates that all of the signalized study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours with the addition of proposed Project traffic to Year 2024 cumulative traffic.

Appendix C presents the ICU LOS calculation worksheets for the study intersections.

TABLE 8-1

YEAR 2024 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

Study Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2024 Cumulative Traffic Conditions		(3) Year 2024 Cumulative Plus Project Traffic Conditions		(4) Exceed LOS Thresholds		(5) Year 2024 Cumulative Plus Project Plus Improvements Traffic Conditions	
			ICU	LOS	ICU	LOS	ICU	LOS	Increase	Yes/No	ICU	LOS
1. SR-57 SB Ramps at Imperial Highway	E	AM	0.558	A	0.638	B	0.644	B	0.006	No	--	--
		PM	0.680	B	0.764	C	0.760	C	-0.004[20]	No	--	--
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway	E	AM	0.557	A	0.615	B	0.604	B	-0.011[21]	No	--	--
		PM	0.693	B	0.758	C	0.741	C	-0.017[21]	No	--	--
3. S. Associated Road at Birch Street	D	AM	0.603	B	0.628	B	0.631	B	0.003	No	--	--
		PM	0.602	B	0.625	B	0.625	B	0.000	No	--	--
4. S. Associated Road at Greenbriar Lane	D	AM	0.262	A	0.269	A	0.313	A	0.044	No	--	--
		PM	0.286	A	0.296	A	0.339	A	0.043	No	--	--
5. S. Associated Road at Imperial Highway	D	AM	0.691	B	0.721	C	0.723	C	0.002	No	--	--
		PM	0.763	C	0.800	D	0.801	D	0.001	No	--	--
6. Placentia Avenue/Castlegate Lane at Imperial Highway	D	AM	0.590	A	0.615	B	0.616	B	0.001	No	--	--
		PM	0.684	B	0.716	C	0.715	C	-0.001[20]	No	--	--
7. S. Associated Road at Brea Plaza Driveway 2	D	AM	--	--	--	--	--	--	--	--	--	--
		PM	--	--	--	--	--	--	--	--	--	--

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

[20] A reduction in delay is due to the negative net project volumes during the PM peak hour only.

[21] A reduction in delay is due to the shifting of volumes going to/from the Mercury Insurance site under Project conditions. Currently, cross-access between Mercury Insurance and Brea Plaza is currently allowed, however, the easement with Mercury Insurance will no longer be applicable as part of the proposed Project. Employees/patrons of Mercury Insurance will be expected to utilize Greenbriar Road to access their site rather than cutting through Brea Plaza. The reduction in delay is also due to the negative net project volumes during the PM peak hour only.

TABLE 8-1 (CONTINUED)

YEAR 2024 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

Study Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2024 Cumulative Traffic Conditions		(3) Year 2024 Cumulative Plus Project Traffic Conditions		(4) Exceed LOS Thresholds		(5) Year 2024 Cumulative Plus Project Plus Improvements Traffic Conditions	
			ICU	LOS	ICU	LOS	ICU	LOS	Increase	Yes/No	ICU	LOS
8. S. Associated Road at Brea Plaza Driveway 3	D	AM	--	--	--	--	--	--	--	--	--	--
		PM	--	--	--	--	--	--	--	--	--	--
9. Brea Plaza Driveway 4 at Imperial Highway	D	AM	--	--	--	--	--	--	--	--	--	--
		PM	--	--	--	--	--	--	--	--	--	--

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

8.2 Year 2024 Traffic Conditions - HCM

Table 8-2 summarizes the peak hour Level of Service results at the nine (9) study intersections evaluated under HCM analysis for the Year 2024 horizon year. The first column (1) of HCM/LOS values in *Table 8-2* presents a summary of existing peak hour traffic conditions. The second column (2) lists projected cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2024 near-term traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in delay due to the added peak hour Project trips and indicates whether the traffic associated with the proposed Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.2.1 *Year 2024 Cumulative Traffic Conditions - HCM*

Review of column (2) of *Table 8-2* indicates that one (1) intersection is forecast to operate adversely during the AM and/or PM peak hours under Year 2024 cumulative traffic conditions. The remaining study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours. The intersection operating adversely includes the following:

	AM Peak Hour		PM Peak Hour	
Study Intersection	**Delay (s/v)**	**LOS**	**Delay (s/v)**	**LOS**
9. Brea Plaza Driveway 4 at Imperial Highway	--	--	35.8	E

8.2.2 *Year 2024 Cumulative Plus Project Conditions - HCM*

Review of columns (3) and (4) of *Table 8-2* indicates that all of the study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours with the addition proposed Project traffic to Year 2024 cumulative traffic.

Although the intersection of Brea Plaza Driveway 4/Imperial Highway (Intersection #9) was operating adversely under Year 2024 cumulative traffic conditions, review of column (4) of *Table 8-2* indicates that the addition of the proposed Project traffic results in a reduction in delay in the PM peak hour. The reduction in delay is due to the negative net project volumes during the PM peak hour.

Appendix D presents the HCM LOS calculation worksheets for the study intersections.

TABLE 8-2

YEAR 2024 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

Study Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2024 Cumulative Traffic Conditions		(3) Year 2024 Cumulative Plus Project Traffic Conditions		(4) Exceed LOS Thresholds		(5) Year 2024 Cumulative Plus Project Plus Improvements Traffic Conditions	
			Delay (s/v)	LOS	Delay (s/v)	LOS	Delay (s/v)	LOS	Increase	Yes/No	Delay (s/v)	LOS
1. SR-57 SB Ramps at Imperial Highway	E	AM	14.9	B	15.5	B	15.5	B	0.0	No	--	--
		PM	15.3	B	16.3	B	16.2	B	-0.1[22]	No	--	--
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway	E	AM	22.7	C	25.3	C	25.0	C	-0.3[23]	No	--	--
		PM	23.3	C	27.8	C	25.4	C	-2.4[23]	No	--	--
3. S. Associated Road at Birch Street	D	AM	27.9	C	28.6	C	28.9	C	0.3	No	--	--
		PM	27.5	C	27.9	C	27.9	C	0.0	No	--	--
4. S. Associated Road at Greenbriar Lane	D	AM	8.3	A	8.3	A	8.3	A	0.0	No	--	--
		PM	6.1	A	6.2	A	8.2	A	2.0	No	--	--
5. S. Associated Road at Imperial Highway	D	AM	26.7	C	28.9	C	30.4	C	1.5	No	--	--
		PM	39.5	D	40.6	D	42.4	D	1.8	No	--	--
6. Placentia Avenue/Castlegate Lane at Imperial Highway	D	AM	17.7	B	18.3	B	18.4	B	0.1	No	--	--
		PM	23.4	C	24.7	C	24.7	C	0.0	No	--	--
7. S. Associated Road at Brea Plaza Driveway 2	D	AM	10.3	B	10.4	B	10.5	B	0.1	No	--	--
		PM	11.1	B	11.3	B	11.2	B	-0.1[22]	No	--	--

Notes:

- s/v = seconds per vehicle
- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.

[22] A reduction in delay is due to the negative net project volumes during the PM peak hour only.

[23] A reduction in delay is due to the shifting of volumes going to/from the Mercury Insurance site under Project conditions. Currently, cross-access between Mercury Insurance and Brea Plaza is currently allowed, however, the easement with Mercury Insurance will no longer be applicable as part of the proposed Project. Employees/patrons of Mercury Insurance will be expected to utilize Greenbriar Road to access their site rather than cutting through Brea Plaza. The reduction in delay is also due to the negative net project volumes during the PM peak hour only.

TABLE 8-2 (CONTINUED)

YEAR 2024 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

Study Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2024 Cumulative Traffic Conditions		(3) Year 2024 Cumulative Plus Project Traffic Conditions		(4) Exceed LOS Thresholds		(5) Year 2024 Cumulative Plus Project Plus Improvements Traffic Conditions	
			Delay (s/v)	LOS	Delay (s/v)	LOS	Delay (s/v)	LOS	Increase	Yes/No	Delay (s/v)	LOS
8. S. Associated Road at Brea Plaza Driveway 3	D	AM	12.5	B	12.7	B	14.2	B	1.5	No	--	--
		PM	16.3	C	16.9	C	17.0	C	0.1	No	--	--
9. Brea Plaza Driveway 4 at Imperial Highway	D	AM	21.4	C	23.4	C	23.4	C	0.0	No	--	--
		PM	30.9	D	**35.8**	**E**	35.0	D	-0.8[24]	No	--	--

Notes:

- s/v = seconds per vehicle
- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.

[24] A reduction in delay is due to the shifting of volumes going to/from the Mercury Insurance site under Project conditions. Currently, cross-access between Mercury Insurance and Brea Plaza is currently allowed, however, the easement with Mercury Insurance will no longer be applicable as part of the proposed Project. Employees/patrons of Mercury Insurance will be expected to utilize Greenbriar Road to access their site rather than cutting through Brea Plaza. The reduction in delay is also due to the negative net project volumes during the PM peak hour only.

8.3 Year 2045 General Plan Buildout Traffic Conditions - ICU

Table 8-3 summarizes the peak hour Level of Service results at the six (6) signalized study intersections evaluated under ICU analysis for the Year 2045. The first column (1) of ICU/LOS values in *Table 8-3* presents a summary of existing peak hour traffic conditions. The second column (2) lists projected Year 2045 General Plan Buildout traffic conditions based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2045 General Plan Buildout traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in ICU value due to the added peak hour Project trips and indicates whether the traffic associated with the proposed Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.3.1 *Year 2045 General Plan Buildout Traffic Conditions - ICU*

Review of column (2) of *Table 8-3* indicates that all of the signalized study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours under Year 2045 General Plan Buildout traffic conditions.

8.3.2 *Year 2045 General Plan Buildout Plus Project Traffic Conditions - ICU*

Review of columns (3) and (4) of *Table 8-3* indicates that all of the signalized study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours with the addition of proposed Project traffic to Year 2045 General Plan Buildout traffic.

Appendix C presents the ICU LOS calculation worksheets for the study intersections.

TABLE 8-3

YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

Study Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 General Plan Buildout Traffic Conditions		(3) Year 2045 General Plan Buildout Plus Project Traffic Conditions		(4) Exceed LOS Thresholds		(5) Year 2045 General Plan Buildout Plus Project Plus Improvements Traffic Conditions	
			ICU	LOS	ICU	LOS	ICU	LOS	Increase	Yes/No	ICU	LOS
1. SR-57 SB Ramps at Imperial Highway	E	AM	0.558	A	0.675	B	0.681	B	0.006	No	--	--
		PM	0.680	B	0.805	D	0.801	D	-0.004[25]	No	--	--
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway	E	AM	0.557	A	0.644	B	0.643	B	-0.001[26]	No	--	--
		PM	0.693	B	0.791	C	0.774	C	-0.017[26]	No	--	--
3. S. Associated Road at Birch Street	D	AM	0.603	B	0.647	B	0.650	B	0.003	No	--	--
		PM	0.602	B	0.646	B	0.646	B	0.000	No	--	--
4. S. Associated Road at Greenbriar Lane	D	AM	0.262	A	0.301	A	0.345	A	0.044	No	--	--
		PM	0.286	A	0.319	A	0.362	A	0.043	No	--	--
5. S. Associated Road at Imperial Highway	D	AM	0.691	B	0.799	C	0.800	D	0.001	No	--	--
		PM	0.763	C	0.851	D	0.851	D	0.000	No	--	--
6. Placentia Avenue/Castlegate Lane at Imperial Highway	D	AM	0.590	A	0.673	B	0.675	B	0.002	No	--	--
		PM	0.684	B	0.749	C	0.749	C	0.000	No	--	--
7. S. Associated Road at Brea Plaza Driveway 2	D	AM	--	--	--	--	--	--	--	--	--	--
		PM	--	--	--	--	--	--	--	--	--	--

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

[25] A reduction in delay is due to the negative net project volumes during the PM peak hour only.

[26] A reduction in delay is due to the shifting of volumes going to/from the Mercury Insurance site under Project conditions. Currently, cross-access between Mercury Insurance and Brea Plaza is currently allowed, however, the easement with Mercury Insurance will no longer be applicable as part of the proposed Project. Employees/patrons of Mercury Insurance will be expected to utilize Greenbriar Road to access their site rather than cutting through Brea Plaza. The reduction in delay is also due to the negative net project volumes during the PM peak hour only.

TABLE 8-3 (CONTINUED)

YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

Study Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 General Plan Buildout Traffic Conditions		(3) Year 2045 General Plan Buildout Plus Project Traffic Conditions		(4) Exceed LOS Thresholds		(5) Year 2045 General Plan Buildout Plus Project Plus Improvements Traffic Conditions	
			ICU	LOS	ICU	LOS	ICU	LOS	Increase	Yes/No	ICU	LOS
8. S. Associated Road at Brea Plaza Driveway 3	D	AM	--	--	--	--	--	--	--	--	--	--
		PM	--	--	--	--	--	--	--	--	--	--
9. Brea Plaza Driveway 4 at Imperial Highway	D	AM	--	--	--	--	--	--	--	--	--	--
		PM	--	--	--	--	--	--	--	--	--	--

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

8.4 Year 2045 General Plan Buildout Traffic Conditions - HCM

Table 8-4 summarizes the peak hour Level of Service results at the nine (9) study intersections evaluated under HCM analysis for the Year 2045. The first column (1) of HCM/LOS values in *Table 8-4* presents a summary of existing peak hour traffic conditions. The second column (2) lists projected Year 2045 General Plan Buildout traffic conditions based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2045 General Plan Buildout traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in delay due to the added peak hour Project trips and indicates whether the traffic associated with the proposed Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.4.1 *Year 2045 General Plan Buildout Traffic Conditions - HCM*

Review of column (2) of *Table 8-4* indicates that one (1) intersection is forecast to operate adversely during the AM and/or PM peak hours under Year 2045 General Plan Buildout traffic conditions. The remaining study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours. The intersection operating adversely includes the following:

	AM Peak Hour		PM Peak Hour	
Study Intersection	**Delay (s/v)**	**LOS**	**Delay (s/v)**	**LOS**
9. Brea Plaza Driveway 4 at Imperial Highway	--	--	39.6	E

8.4.2 *Year 2045 General Plan Buildout Plus Project Traffic Conditions – HCM*

Review of column (3) of *Table 8-4* indicates that one (1) intersection is forecast to operate adversely during the AM and/or PM peak hours with the addition of proposed Project traffic to Year 2045 General Plan Buildout traffic. The remaining study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours. The intersection operating adversely includes the following:

	AM Peak Hour		PM Peak Hour	
Study Intersection	**Delay (s/v)**	**LOS**	**Delay (s/v)**	**LOS**
9. Brea Plaza Driveway 4 at Imperial Highway	--	--	38.8	E

Review of column (4) of *Table 8-4* indicates that the addition of proposed Project traffic at the intersection of Brea Plaza Driveway 4/Imperial Highway (Intersection #9) results in a reduction in delay in the PM peak hour. The reduction in delay is due to the negative net project volumes during the PM peak hour. Therefore, Project-related improvements at this location are not required based on the criteria defined in this report.

Appendix D presents the HCM LOS calculation worksheets for the study intersections.

TABLE 8-4

YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

Study Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 General Plan Buildout Traffic Conditions		(3) Year 2045 General Plan Buildout Plus Project Traffic Conditions		(4) Exceed LOS Thresholds		(5) Year 2045 General Plan Buildout Plus Project Plus Improvements Traffic Conditions	
			Delay (s/v)	LOS	Delay (s/v)	LOS	Delay (s/v)	LOS	Increase	Yes/No	Delay (s/v)	LOS
1. SR-57 SB Ramps at Imperial Highway	E	AM	14.9	B	14.9	B	14.9	B	0.0	No	--	--
		PM	15.3	B	16.4	B	16.4	B	0.0	No	--	--
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway	E	AM	22.7	C	24.0	C	23.0	C	-1.0[27]	No	--	--
		PM	23.3	C	27.8	C	26.1	C	-1.7[27]	No	--	--
3. S. Associated Road at Birch Street	D	AM	27.9	C	25.3	C	25.5	C	0.2	No	--	--
		PM	27.5	C	27.1	C	27.1	C	0.0	No	--	--
4. S. Associated Road at Greenbriar Lane	D	AM	8.3	A	6.8	A	6.8	A	0.0	No	--	--
		PM	6.1	A	6.1	A	7.9	A	1.8	No	--	--
5. S. Associated Road at Imperial Highway	D	AM	26.7	C	27.9	C	30.2	C	2.3	No	--	--
		PM	39.5	D	39.6	D	40.1	D	0.5	No	--	--
6. Placentia Avenue/Castlegate Lane at Imperial Highway	D	AM	17.7	B	17.5	B	17.6	B	0.1	No	--	--
		PM	23.4	C	23.1	C	23.1	C	0.0	No	--	--
7. S. Associated Road at Brea Plaza Driveway 2	D	AM	10.3	B	10.4	B	10.5	B	0.1	No	--	--
		PM	11.1	B	11.3	B	11.2	B	-0.1[28]	No	--	--

Notes:

- s/v = seconds per vehicle
- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.

[27] A reduction in delay is due to the shifting of volumes going to/from the Mercury Insurance site under Project conditions. Currently, cross-access between Mercury Insurance and Brea Plaza is currently allowed, however, the easement with Mercury Insurance will no longer be applicable as part of the proposed Project. Employees/patrons of Mercury Insurance will be expected to utilize Greenbriar Road to access their site rather than cutting through Brea Plaza. The reduction in delay is also due to the negative net project volumes during the PM peak hour only.

[28] A reduction in delay is due to the negative net project volumes during the PM peak hour only.

TABLE 8-4 (CONTINUED)

YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

Study Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 General Plan Buildout Traffic Conditions		(3) Year 2045 General Plan Buildout Plus Project Traffic Conditions		(4) Exceed LOS Thresholds		(5) Year 2045 General Plan Buildout Plus Project Plus Improvements Traffic Conditions	
			Delay (s/v)	LOS	Delay (s/v)	LOS	Delay (s/v)	LOS	Increase	Yes/No	Delay (s/v)	LOS
8. S. Associated Road at Brea Plaza Driveway 3	D	AM	12.5	B	13.3	B	14.6	B	1.3	No	--	--
		PM	16.3	C	17.0	C	17.1	C	0.1	No	--	--
9. Brea Plaza Driveway 4 at Imperial Highway	D	AM	21.4	C	24.6	C	24.7	C	0.1	No	--	--
		PM	30.9	D	**39.6**	**E**	**38.8**	**E**	-0.8[29]	No	--	--

Notes:

- s/v = seconds per vehicle
- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.

[29] A reduction in delay is due to the negative net project volumes during the PM peak hour only.

9.0 INTERSECTION VEHICLE QUEUEING EVALUATION

A queueing evaluation has been completed at the nine (9) study intersections to assess if the stacking requirements with the proposed Project are adequate. In addition, it is our understanding that Caltrans has concerns regarding safety and queuing issues due to weaving along Imperial Highway at the SR-57 NB On-Ramp, located approximately 150 feet from the Brea Plaza Driveway 1.

The queuing evaluation was conducted for Year 2024 Cumulative and Year 2045 General Plan Buildout traffic conditions based on the Average Queue methodology, which calculates the average queue value in terms of number of vehicles per lane. At signalized intersections, the storage length for left-turn and right-turn lanes may be based on one and one-half (1½) to two (2) times the average number of vehicles that would store per signal cycle[30]. For the purposes of this traffic analysis, the minimum storage requirement for left-turn lanes and right-turn lanes was calculated by taking 1½ times the average queue length. (Minimum required storage = Q_{av} (feet) x 1.5). The storage lengths at unsignalized intersection locations are based on 95th Percentile methodology.

It should be noted that the Synchro software takes into consideration traffic volume data, lane configurations, traffic signal phasing and potential weaving between intersections in order to calculate the queues for each movement. The existing storage lengths were determined based on a review of aerial maps of the subject intersections obtained from Google Earth and field reviews conducted by LLG Engineers. An average vehicle length of 25 feet is assumed for the purposes of this analysis.

9.1 Year 2024 Traffic Conditions

Table 9-1 presents the AM and PM peak hour queueing analyses results for the nine (9) study intersections. Column (1) presents the queueing results for Year 2024 Cumulative traffic conditions. Column (2) presents the queueing results for Year 2024 Cumulative Plus Project traffic conditions.

9.1.1 *Year 2024 Cumulative Traffic Conditions*

Review of column (1) of *Table 9-1* indicates that the queues for the nine (9) study intersections are considered adequate under Year 2024 Cumulative traffic conditions.

9.1.2 *Year 2024 Cumulative Plus Project Traffic Conditions*

Review of column (2) of *Table 9-1* indicates that the queues for the nine (9) study intersections are considered adequate with the addition of project traffic to Year 2024 Cumulative traffic. Furthermore, review of SR-57 NB Ramps/Brea Plaza Driveway 1/Imperial Highway (Intersection #2) indicates that the proposed Project will not adversely affect the queues at the intersection or adversely contribute to the potential weaving along Imperial Highway between the SR-57 NB On-Ramp and Brea Plaza Driveway 1.

Appendix F presents the Synchro queuing worksheets for the study intersections.

[30] Source: Highway Design Manual, Intersections at Grade, page 400-9, CALTRANS

9.2 Year 2045 General Plan Buildout Traffic Conditions

Table 9-2 presents the AM and PM peak hour queueing analyses results for the nine (9) study intersections. Column (1) presents the queueing results for Year 2045 General Plan Buildout traffic conditions. Column (2) presents the queueing results for Year 2045 General Plan Buildout Plus Project traffic conditions.

9.2.1 *Year 2045 General Plan Buildout Traffic Conditions*

Review of column (1) of *Table 9-2* indicates that the queues for the nine (9) study intersections are considered adequate under Year 2045 General Plan Buildout traffic conditions.

9.2.2 *Year 2045 General Plan Buildout Plus Project Traffic Conditions*

Review of column (2) of *Table 9-2* indicates that the queues for the nine (9) study intersections are considered adequate with the addition of project traffic to Year 2045 General Plan Buildout traffic. Furthermore, review of SR-57 NB Ramps/Brea Plaza Driveway 1/Imperial Highway (Intersection #2) indicates that the proposed Project will not adversely affect the queues at the intersection or adversely contribute to the potential weaving along Imperial Highway between the SR-57 NB On-Ramp and Brea Plaza Driveway 1.

Appendix F presents the Synchro queuing worksheets for the study intersections.

TABLE 9-1

YEAR 2024 PEAK HOUR INTERSECTION QUEUING ANALYSIS

Study Intersections	Estimated Storage Provided (feet)	(1) Year 2024 Cumulative Traffic Conditions				(2) Year 2024 Cumulative Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required[31]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[31]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[31]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[31]	Adequate Storage (Yes / No)
1. SR-57 SB Ramps at Imperial Highway									
Southbound Left-Turn	1,300	398	Yes	456	Yes	401	Yes	455	Yes
Southbound Left/Right-Turn	1,300	398	Yes	456	Yes	401	Yes	455	Yes
Southbound Right-Turn	1,300[32]	401	Yes	456	Yes	401	Yes	456	Yes
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway									
Northbound Left-Turn	955[33]	500	Yes	494	Yes	500	Yes	495	Yes
Northbound Left/Through/Right	1,300	570	Yes	525	Yes	582	Yes	521	Yes
Northbound Right-Turn	1,300[34]	417	Yes	357	Yes	425	Yes	350	Yes
Southbound Right-Turn	145[35]	25	Yes	129	Yes	39	Yes	93	Yes
Eastbound Left-turn	260	162	Yes	258	Yes	132	Yes	216	Yes
Eastbound Through	990	510	Yes	438	Yes	531	Yes	437	Yes

31 Maximum queue is calculated by multiplying the *Average Queue* by a factor of 1.5 for signalized intersections. Maximum queue is based on the 95th percentile for unsignalized intersections.

32 The southbound right-turn pocket consists of approximately 265 feet of storage; however, an additional 1,035 feet of storage from the shared left/right-turn lane can accommodate the remaining vehicles.

33 The northbound left-turn consists of dual lanes. The first lane consists of approximately 1,300 feet of storage and the second lane consists of approximately 610 feet of storage. The storage reported is the average of both lanes.

34 The northbound right-turn pocket consists of approximately 500 feet or storage; however, an additional 800 feet of storage from the shared left/thru/right lane can accommodate the remaining vehicles.

35 The turn-lane consists of dual lanes.

TABLE 9-1 (CONTINUED)

YEAR 2024 PEAK HOUR INTERSECTION QUEUING ANALYSIS

Study Intersections	Estimated Storage Provided (feet)	(1) Year 2024 Cumulative Traffic Conditions				(2) Year 2024 Cumulative Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required[36]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[36]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[36]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[36]	Adequate Storage (Yes / No)
2. *SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway (Continued)*									
Westbound Through	435	126	Yes	209	Yes	116	Yes	215	Yes
Westbound Through/Right	435	126	Yes	209	Yes	116	Yes	215	Yes
3. S. Associated Road at Birch Street									
Northbound Left-Turn	298[37]	173	Yes	275	Yes	167	Yes	272	Yes
Northbound Right-Turn	230	162	Yes	189	Yes	147	Yes	185	Yes
Southbound Left-Turn	100	66	Yes	25	Yes	66	Yes	25	Yes
Eastbound Left-turn	150	25	Yes	25	Yes	25	Yes	25	Yes
Westbound Left-Turn	220[38]	231	Yes[39]	182	Yes	234	Yes[39]	182	Yes
4. S. Associated Road at Greenbriar Lane									
Northbound Left-Turn	100	25	Yes	25	Yes	25	Yes	25	Yes
Southbound Left-Turn	110	25	Yes	25	Yes	25	Yes	25	Yes

[36] Maximum queue is calculated by multiplying the *Average Queue* by a factor of 1.5 for signalized intersections. Maximum queue is based on the 95th percentile for unsignalized intersections.

[37] The northbound left-turn consists of dual lanes. The first lane consists of approximately 370 feet of storage and the second lane consists of approximately 225 feet of storage. The storage reported is the average of both lanes.

[38] The turn-lane consists of dual lanes.

[39] The remaining queue can be accommodated within the transition area of the turn-lane.

TABLE 9-1 (CONTINUED)

YEAR 2024 PEAK HOUR INTERSECTION QUEUING ANALYSIS

Study Intersections	Estimated Storage Provided (feet)	(1) Year 2024 Cumulative Traffic Conditions				(2) Year 2024 Cumulative Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required[40]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[40]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[40]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[40]	Adequate Storage (Yes / No)
5. S. Associated Road at Imperial Highway									
Northbound Left-Turn	170[41]	101	Yes	143	Yes	101	Yes	141	Yes
Southbound Left-Turn	210[42]	96	Yes	239	Yes[43]	104	Yes	225	Yes[43]
Southbound Right-Turn	215	25	Yes	25	Yes	25	Yes	25	Yes
Eastbound Left-turn	340	195	Yes	294	Yes	275	Yes	308	Yes
Westbound Left-Turn	200	113	Yes	212	Yes[43]	113	Yes	213	Yes[43]
6. Placentia Avenue/Castlegate Lane at Imperial Highway									
Northbound Left-Turn	195	123	Yes	192	Yes	123	Yes	191	Yes
Northbound Right-Turn	195	25	Yes	25	Yes	25	Yes	25	Yes
Southbound Left-Turn	85	42	Yes	44	Yes	42	Yes	44	Yes
Eastbound Left-turn	140	25	Yes	25	Yes	25	Yes	25	Yes
Eastbound Right-Turn	200	25	Yes	25	Yes	25	Yes	25	Yes
Westbound Left-Turn	225	216	Yes	267	Yes[43]	216	Yes	267	Yes[43]

[40] Maximum queue is calculated by multiplying the *Average Queue* by a factor of 1.5 for signalized intersections. Maximum queue is based on the 95th percentile for unsignalized intersections.

[41] The northbound left-turn consists of dual lanes. The first lane consists of approximately 240 feet of storage and the second lane consists of approximately 100 feet of storage. The storage reported is the average of both lanes.

[42] The turn-lane consists of dual lanes.

[43] The remaining queue can be accommodated within the transition area of the turn-lane.

TABLE 9-1 (CONTINUED)

YEAR 2024 PEAK HOUR INTERSECTION QUEUING ANALYSIS

Study Intersections	Estimated Storage Provided (feet)	(1) Year 2024 Cumulative Traffic Conditions				(2) Year 2024 Cumulative Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required[44]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[44]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[44]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[44]	Adequate Storage (Yes / No)
7. S. Associated Road at Brea Plaza Driveway 2									
Eastbound Right-Turn	90	25	Yes	25	Yes	25	Yes	25	Yes
8. S. Associated Road at Brea Plaza Driveway 3									
Northbound Left-Turn	90	25	Yes	25	Yes	25	Yes	25	Yes
Eastbound Left-Turn	75	25	Yes	25	Yes	25	Yes	25	Yes
Eastbound Right-Turn	75	25	Yes	25	Yes	25	Yes	25	Yes
9. Brea Plaza Driveway 4 at Imperial Highway									
Southbound Right-Turn	160	25	Yes	25	Yes	25	Yes	25	Yes

[44] Maximum queue is calculated by multiplying the *Average Queue* by a factor of 1.5 for signalized intersections. Maximum queue is based on the 95th percentile for unsignalized intersections.

TABLE 9-2

YEAR 2045 PEAK HOUR INTERSECTION QUEUING ANALYSIS

Study Intersections	Estimated Storage Provided (feet)	(1) Year 2045 General Plan Buildout Traffic Conditions				(2) Year 2045 General Plan Buildout Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required[45]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[45]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[45]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[45]	Adequate Storage (Yes / No)
1. SR-57 SB Ramps at Imperial Highway									
Southbound Left-Turn	1,300	383	Yes	467	Yes	381	Yes	465	Yes
Southbound Left/Right-Turn	1,300	383	Yes	467	Yes	381	Yes	465	Yes
Southbound Right-Turn	1,300[46]	374	Yes	464	Yes	384	Yes	464	Yes
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway									
Northbound Left-Turn	955[47]	467	Yes	492	Yes	467	Yes	494	Yes
Northbound Left/Through/Right	1,300	518	Yes	521	Yes	527	Yes	509	Yes
Northbound Right-Turn	1,300[48]	378	Yes	350	Yes	383	Yes	350	Yes
Southbound Right-Turn	145[49]	25	Yes	104	Yes	25	Yes	72	Yes
Eastbound Left-turn	260	137	Yes	240	Yes	111	Yes	203	Yes
Eastbound Through	990	530	Yes	416	Yes	548	Yes	414	Yes

45 Maximum queue is calculated by multiplying the *Average Queue* by a factor of 1.5 for signalized intersections. Maximum queue is based on the 95th percentile for unsignalized intersections.

46 The southbound right-turn pocket consists of approximately 265 feet of storage; however, an additional 1,035 feet of storage from the shared left/right-turn lane can accommodate the remaining vehicles.

47 The northbound left-turn consists of dual lanes. The first lane consists of approximately 1,300 feet of storage and the second lane consists of approximately 610 feet of storage. The storage reported is the average of both lanes.

48 The northbound right-turn pocket consists of approximately 500 feet or storage; however, an additional 800 feet of storage from the shared left/thru/right lane can accommodate the remaining vehicles.

49 The turn-lane consists of dual lanes.

TABLE 9-2 (CONTINUED)

YEAR 2045 PEAK HOUR INTERSECTION QUEUING ANALYSIS

Study Intersections	Estimated Storage Provided (feet)	(1) Year 2045 General Plan Buildout Traffic Conditions				(2) Year 2045 General Plan Buildout Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required[50]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[50]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[50]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[50]	Adequate Storage (Yes / No)
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway (Continued)									
Westbound Through	435	111	Yes	201	Yes	114	Yes	204	Yes
Westbound Through/Right	435	111	Yes	201	Yes	114	Yes	25	Yes
3. S. Associated Road at Birch Street									
Northbound Left-Turn	298[51]	147	Yes	296	Yes	137	Yes	294	Yes
Northbound Right-Turn	230	83	Yes	170	Yes	81	Yes	170	Yes
Southbound Left-Turn	100	51	Yes	25	Yes	51	Yes	25	Yes
Eastbound Left-turn	150	25	Yes	25	Yes	25	Yes	25	Yes
Westbound Left-Turn	220[52]	221	Yes[53]	182	Yes	222	Yes[53]	182	Yes
4. S. Associated Road at Greenbriar Lane									
Northbound Left-Turn	100	25	Yes	25	Yes	25	Yes	25	Yes
Southbound Left-Turn	110	25	Yes	25	Yes	25	Yes	25	Yes

[50] Maximum queue is calculated by multiplying the *Average Queue* by a factor of 1.5 for signalized intersections. Maximum queue is based on the 95th percentile for unsignalized intersections.

[51] The northbound left-turn consists of dual lanes. The first lane consists of approximately 370 feet of storage and the second lane consists of approximately 225 feet of storage. The storage reported is the average of both lanes.

[52] The turn-lane consists of dual lanes.

[53] The remaining queue can be accommodated within the transition area of the turn-lane.

TABLE 9-2 (CONTINUED)

YEAR 2045 PEAK HOUR INTERSECTION QUEUING ANALYSIS

Study Intersections	Estimated Storage Provided (feet)	(1) Year 2045 General Plan Buildout Traffic Conditions				(2) Year 2045 General Plan Buildout Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required[54]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[54]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[54]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[54]	Adequate Storage (Yes / No)
5. S. Associated Road at Imperial Highway									
Northbound Left-Turn	170[55]	90	Yes	137	Yes	90	Yes	137	Yes
Southbound Left-Turn	210[56]	95	Yes	203	Yes	101	Yes	192	Yes
Southbound Right-Turn	215	25	Yes	25	Yes	25	Yes	25	Yes
Eastbound Left-turn	340	185	Yes	323	Yes	260	Yes	353	Yes[57]
Westbound Left-Turn	200	114	Yes	267	Yes[57]	114	Yes	267	Yes[57]
6. Placentia Avenue/Castlegate Lane at Imperial Highway									
Northbound Left-Turn	195	108	Yes	176	Yes	108	Yes	174	Yes
Northbound Right-Turn	195	25	Yes	25	Yes	25	Yes	25	Yes
Southbound Left-Turn	85	30	Yes	30	Yes	30	Yes	30	Yes
Eastbound Left-turn	140	25	Yes	25	Yes	25	Yes	25	Yes
Eastbound Right-Turn	200	25	Yes	25	Yes	25	Yes	25	Yes
Westbound Left-Turn	225	225	Yes	264	Yes[57]	225	Yes	264	Yes[57]

54 Maximum queue is calculated by multiplying the *Average Queue* by a factor of 1.5 for signalized intersections. Maximum queue is based on the 95th percentile for unsignalized intersections.

55 The northbound left-turn consists of dual lanes. The first lane consists of approximately 240 feet of storage and the second lane consists of approximately 100 feet of storage. The storage reported is the average of both lanes.

56 The turn-lane consists of dual lanes.

57 The remaining queue can be accommodated within the transition area of the turn-lane.

TABLE 9-2 (CONTINUED)

YEAR 2045 PEAK HOUR INTERSECTION QUEUING ANALYSIS

Study Intersections	Estimated Storage Provided (feet)	(1) Year 2045 General Plan Buildout Traffic Conditions				(2) Year 2045 General Plan Buildout Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required[58]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[58]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[58]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[58]	Adequate Storage (Yes / No)
7. S. Associated Road at Brea Plaza Driveway 2									
Eastbound Right-Turn	90	25	Yes	25	Yes	25	Yes	25	Yes
8. S. Associated Road at Brea Plaza Driveway 3									
Northbound Left-Turn	90	25	Yes	25	Yes	25	Yes	25	Yes
Eastbound Left-Turn	75	25	Yes	25	Yes	25	Yes	25	Yes
Eastbound Right-Turn	75	25	Yes	25	Yes	25	Yes	25	Yes
9. Brea Plaza Driveway 4 at Imperial Highway									
Southbound Right-Turn	160	25	Yes	25	Yes	25	Yes	25	Yes

[58] Maximum queue is calculated by multiplying the *Average Queue* by a factor of 1.5 for signalized intersections. Maximum queue is based on the 95th percentile for unsignalized intersections.

10.0 INTERSECTION SAFETY EVALUATION

10.1 Imperial Highway Intersection Safety Evaluation

It is our understanding that Caltrans has implemented improvements at intersections along Imperial Highway within the recent years which generally include traffic signal upgrades and ADA improvements. As such, an intersection safety evaluation has been completed for all of the signalized study intersections located along Imperial Highway to validate whether the recent improvements have helped reduce the collision frequency at these locations.

Five years of collision history has been researched via the Statewide Integrated Traffic Records System (SWITRS); the data was compiled from May 2016 through May 2021. ***Table 10-1*** presents a summary of the last five (5) years of accident history at the four (4) study intersections located along Imperial Highway. Review of *Table 10-1* indicates that when taking into consideration the total number of collisions that occur within the project study area, the number of collisions along Imperial Highway have generally declined within the last five years. Therefore, it can be concluded that the improvements implemented at these intersections have played a role in reducing the collision frequency and has generally helped increase safety at the locations.

10.2 Intersection Safety Enhancements at S. Associated Road and Birch Street

The City has raised concerns regarding bicycle safety at the intersection of S. Associated Road at Birch Street. It is our understanding that the eastbound right-turn movement at the intersection currently experiences high traffic volumes due to the existing Brea Plaza center. Review of *Figures 3-5* and *3-6* indicate that 294 vehicles in the AM peak hour and 278 vehicles in the PM peak hour currently complete an eastbound right-turn under existing traffic conditions. Vehicles are required to cross the existing bike lane in order to complete the turn movement which creates a safety issue for bicyclists traveling eastbound. Therefore, to increase bicycle safety as well as improve traffic flow, it is recommended to implement the following improvements:

- **Intersection No. 3 – S. Associated Road at Birch Street:** Restripe the west leg to provide an exclusive eastbound right-turn pocket with 150-feet of storage and a 4-foot bike lane located to the left of the turn pocket. Modify the existing traffic signal to allow for an eastbound right-turn overlap phase and replace the existing R73-5(CA) sign for the northbound left-turn lanes with a R73-6(CA) sign to restrict U-turns in the northbound direction. These improvements are subject to the approval of the City of Brea and are recommended as a condition of approval for the proposed Project.

Figure 10-1 presents a conceptual improvement plan for the intersection safety enhancements at S. Associated Road and Birch Street.

Table 10-2 presents the peak hour level of service results based on both ICU and HCM analyses at the intersection of S. Associated Road at Birch Street for Year 2045 traffic conditions. The first

column (1) presents a summary of Year 2045 General Plan Buildout Plus Project traffic conditions, which was previously presented in *Tables 8-3* and *8-4*. The second column (2) presents Year 2045 General Plan Buildout Plus Project traffic conditions with the implementation of the intersection safety enhancement improvements. Review of *Table 10-2* indicates that the intersection is forecast to operate at acceptable level of service during the weekday AM and PM peak hours with the improvements. Furthermore, a comparison of columns (1) and (2) indicate that the improvements will improve service levels at the intersection.

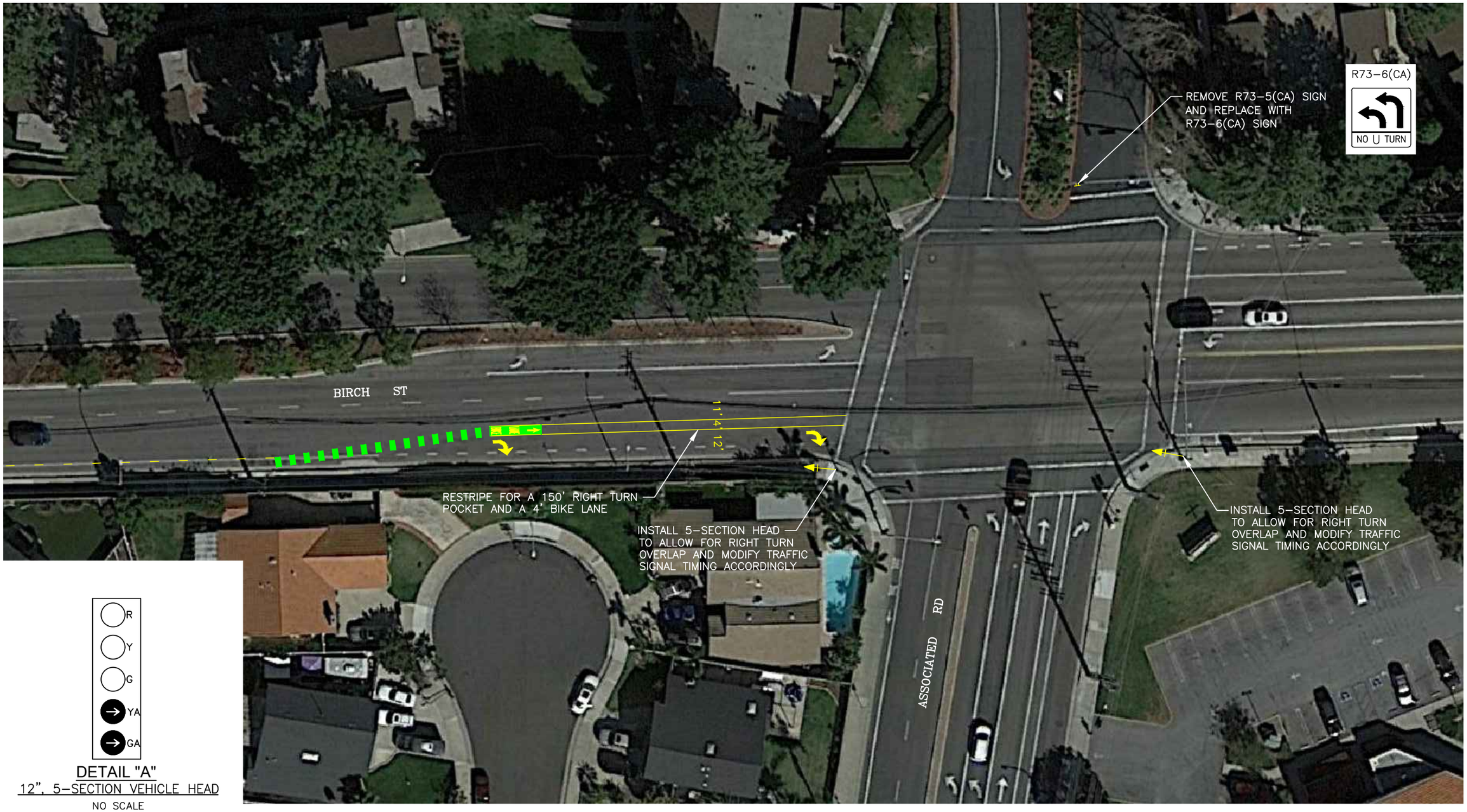
Table 10-3 presents the AM and PM peak hour queueing analyses results for the eastbound right-turn pocket for Year 2045 General Plan Buildout Plus Project traffic conditions with the implementation of the intersection safety enhancement improvements. Review of *Table 10-3* indicates that the eastbound right-turn queues at the intersection can be accommodated within the proposed storage of 150 feet.

Appendix G presents the level of service and queueing worksheets based on the intersection safety enhancement.

TABLE 10-1

IMPERIAL HIGHWAY ACCIDENT HISTORY

Study Intersection	Number of Collisions Per Year				
	2016 - 2017	2017-2018	2018-2019	2019-2020	2020-2021
1. SR-57 SB Ramps at Imperial Highway	8	3	8	7	4
2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway	20	18	12	8	11
5. S. Associated Road at Imperial Highway	11	17	14	14	15
6. Placentia Avenue/Castlegate Lane at Imperial Highway	13	8	11	6	5
Total Collisions along Imperial Highway	**52**	**46**	**45**	**35**	**35**



DETAIL "A"
12", 5-SECTION VEHICLE HEAD
NO SCALE

n:\4100\2194157 - brea plaza expansion project, brea\dwg\concept\4099 cp-01.dwg LDP 09:58:14 07-29-2021 lam

LINSCOTT LAW & GREENSPAN engineers

N SCALE: 1"=40'

FIGURE 10-1

CONCEPTUAL IMPROVEMENT PLAN - BIRCH ST AT ASSOCIATED RD
BREA PLAZA EXPANSION PROJECT, BREA

TABLE 10-2

YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Study Intersection	Minimum Acceptable LOS	Time Period	(1) Year 2045 General Plan Buildout Plus Project Traffic Conditions				(2) Year 2045 General Plan Buildout Plus Project Traffic Conditions with Intersection Safety Enhancements			
			ICU	LOS	Delay (s/v)	LOS	ICU	LOS	Delay (s/v)	LOS
3. S. Associated Road at Birch Street	D	AM	0.650	B	25.5	C	0.556	A	23.4	C
		PM	0.646	B	27.1	C	0.587	A	25.9	C

Notes:

- s/v = seconds per vehicle
- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.

TABLE 10-3

YEAR 2045 GENERAL PLAN BUILDOUT PLUS PROJECT PEAK HOUR INTERSECTION QUEUING ANALYSIS

Study Intersections	Proposed Storage	(1) Year 2045 General Plan Buildout Plus Project Traffic Conditions with Intersection Safety Enhancements			
		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required[59]	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required[59]	Adequate Storage (Yes / No)
3. S. Associated Road at Birch Street					
Eastbound Right-Turn	150’	38’	Yes	38’	Yes

[59] Maximum queue is calculated by multiplying the *Average Queue* by a factor of 1.5 for signalized intersections. Maximum queue is based on the 95th percentile for unsignalized intersections.

11.0 SITE ACCESS EVALUATION

11.1 Driveway 3 Traffic Signal Warrant Analysis

Due to the expiration of the Mercury Insurance easement, motorists leaving the project site who wish to travel north will no longer have access to Greenbriar Lane and are anticipated to primarily utilize Driveway 3. As such, a traffic signal warrant analysis was completed for S. Associated Road at Brea Plaza Driveway 3 to determine the need for signalization at the intersection.

This assessment is made on the basis of signal warrant criteria adopted by Caltrans. For this study, the need for signalization is assessed on the basis of the peak-hour traffic signal warrant, Warrant #3, described in the *California Manual on Uniform Traffic Control Devices (MUTCD).*

Warrant #3 has two parts:

1. *Part A* evaluates peak hour vehicle delay for traffic on the minor street approach with the highest delay, and
2. *Part B* evaluates peak-hour traffic volumes on the major and minor streets.

This method provides an indication of whether peak-hour traffic conditions or peak-hour traffic volume levels are, or would be, sufficient to justify installation of a traffic signal. Other traffic signal warrants are available, however, they cannot be checked under future conditions because they rely on data for which forecasts are not available (such as accidents, pedestrian volume, and four- or eight-hour vehicle volumes).

The decision to install a traffic signal should not be based purely on the warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Additionally, engineering judgment is exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections.

The results of the peak-hour traffic signal warrant analysis for Year 2024 Cumulative Plus Project and Year 2045 General Plan Buildout Plus Project traffic conditions are summarized in ***Table 11-1***. The results indicate that S. Associated Road at Brea Plaza Driveway 3 does not satisfy the criteria for a traffic signal. Furthermore, review of the level of service results presented in Section 8.0 indicates that the intersection is forecast to operate at acceptable level of service without the installation of a traffic signal. Therefore, the installation of a traffic signal the intersection is not recommended.

Appendix H presents the traffic signal warrant worksheets.

TABLE 11-1

DRIVEWAY 3 TRAFFIC SIGNAL WARRANT ANALYSIS SUMMARY[60]

Key Intersection	Time Period	(1) Year 2024 Cumulative Plus Project Traffic Conditions		(2) Year 2045 General Plan Buildout Plus Project Traffic Conditions	
		Part A of Warrant 3 Satisfied?	Part B of Warrant 3 Satisfied?	Part A of Warrant 3 Satisfied?	Part B of Warrant 3 Satisfied?
8. S. Associated Road at Brea Plaza Driveway 3	AM	No	No	No	No
	PM	No	No	No	No

60 Signal Warrant checks based on Warrant 3, Part A – Peak Hour Delay Warrant and Part B – Peak Hour Volume Warrant combined in the California MUTCD.

11.2 Internal Circulation Evaluation

As previously stated, access to the project site will continue to be served by the existing Brea Plaza driveways including the signalized intersection of Imperial Highway at SR-57 NB Ramps/Brea Plaza (Intersection #2), a right-turn only driveway on Associated Road (Intersection #7), a full access unsignalized driveway on Associated Road (Intersection #8), and a right-turn only driveway on Imperial Highway (Intersection #9). Since there are no changes proposed at any of the driveways as part of the proposed Project, it is assumed that trash trucks, delivery trucks, and fire trucks will continue to access the Project site without any issues. Additionally, the on-site circulation was evaluated in terms of vehicle-pedestrian conflicts. Based on our review of the proposed site plan, the overall layout does not create any unsafe vehicle-pedestrian conflict points and the driveway throating is sufficient such that access to parking spaces is not impacted by internal vehicle queuing/stacking. The on-site circulation is adequate based on our review of the proposed site plan, whereas the alignment, spacing, and throating of the Project driveways is adequate. The circulation around the buildings is adequate with sufficient sight distance along the drive aisles.

12.0 AREA-WIDE TRAFFIC IMPROVEMENTS

For those intersections where projected traffic volumes are expected to exceed the LOS criteria thresholds, this report recommends traffic improvements that change the intersection geometry to increase capacity. These capacity improvements involve roadway widening and/or re-striping to reconfigure roadways to specific approaches of a study intersection. The identified improvements are expected to improve levels of service at the location which exceed the LOS criteria thresholds.

12.1 Project-Specific Improvements

As previously discussed in Section 10.2, the following improvements are recommended as a condition of approval for the proposed Project in order to increase bicycle safety as well as improve traffic flow at the intersection of S. Associated Road at Birch Street:

- **Intersection No. 3 – S. Associated Road at Birch Street:** Restripe the west leg to provide an exclusive eastbound right-turn pocket with 150-feet of storage and a 4-foot bike lane located to the left of the turn pocket. Modify the existing traffic signal to allow for an eastbound right-turn overlap phase and replace the existing R73-5(CA) sign for the northbound left-turn lanes with a R73-6(CA) sign to restrict U-turns in the northbound direction. These improvements are subject to the approval of the City of Brea.

12.2 Year 2024 Cumulative Plus Project Traffic Conditions

The results of the intersection capacity analyses presented previously in *Tables 8-1* and *8-2* indicate that none of the nine (9) study intersections are forecast to exceed the LOS criteria thresholds under Year 2024 Cumulative Plus Project traffic conditions. Therefore, Project-related improvements are not required or recommended.

12.3 Year 2045 General Plan Buildout Plus Project Traffic Conditions

The results of the intersection capacity analyses presented previously in *Tables 8-3* and *8-4* indicate that none of the nine (9) study intersections are forecast to exceed the LOS criteria thresholds under Year 2045 General Plan Buildout Plus Project traffic conditions. Therefore, Project-related improvements are not required or recommended.

12.4 City of Brea Traffic Impact Fees

Based on information published on the City of Brea website, the Brea City Council adopted Ordinance 966 in July 1995, establishing Traffic Impact Fees for all new development in Brea and annexed portions of its sphere-of-influence. Based on a Transportation Improvement Nexus Program study conducted in 2011, the City Council adopted Resolution 2011-096, which updated the impact fees, which became effective February 4, 2012. These fees are required, in part, by Orange County's Measure M, a transportation initiative passed by voters in 1990. More importantly, these are fair-share based fees that will serve to offset the required traffic improvements caused by new development.

Review of ***Table 12-1*** indicates that the City's Traffic Impact Fee rate for residential land uses range from $1,203 per dwelling unit to $1,974 per dwelling unit. For Office uses the City's rate is $1.25 per gross square foot.

Subject to confirmation by City staff, the proposed Project's Traffic Impact Fee totals $260,852.75 based on a net increase of 21,355 SF of office uses along with 229 high density residential units (i.e. 21,355 SF x $1.25 per SF = $26,693.75 and 229 DU x $1,203 per DU = $275,487.00). Since fees have already been paid towards the existing theater which will be removed a credit of $41,328.00 could be taken (i.e. 18,450 SF x $2.24 = $41,328.00). The precise fee will be determined upon issuance of Project building permits by the City of Brea Community Development Department.

TABLE 12-1

CITY OF BREA TRAFFIC IMPACT FEE RATES [61]

Land Use Category	Unit of Development	Fee
▪ Low density residential	Per dwelling unit	$1,974
▪ Medium density residential	Per dwelling unit	$1,453
▪ High density residential	Per dwelling unit	$1,203
▪ Commercial, general, mixed use	Per gross square foot	$2.53
▪ Regional commercial	Per gross square foot	$2.24
▪ Office / industrial	Per gross square foot	$1.25
▪ School	Student	$0
▪ All other uses	Per trip end	$89

61 Source: City of Brea website - http://www.ci.brea.ca.us/162/Traffic-Impact-Fees

13.0 CONGESTION MANAGEMENT PROGRAM (CMP) COMPLIANCE ASSESSMENT

This analysis is consistent with the requirements and procedures outlined in the current *Orange County Congestion Management Program (CMP).* The CMP requires that a traffic analysis be conducted for any project generating 2,400 or more daily trips, or 1,600 or more daily trips for projects that directly access the CMP Highway System (HS). As noted in *Section 5.0* of this traffic study, the proposed Project is forecast to generate -1,680 weekday net daily trip-ends and therefore a CMP analysis is not required.

14.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- ***Project Description*** – Brea Plaza is an existing retail center addressed at 409-477 S. Associated Road and 1555, 1609, 1623, 1643 E. Imperial Highway that is generally located north of Imperial Highway, west of Associated Road, and east of SR-57 Freeway in the City of Brea, California. The existing Brea Plaza includes 165,329 square-feet (SF) of floor area consisting of mixture of retail/commercial use, service/retail shops, a movie theatre, restaurant/ food uses and fast-food restaurants with drive-through. Parking for the retail center currently totals 725 on-site spaces with an additional 180 spaces available in an easement with Mercury Insurance during business hours and all spaces after 5:00 PM and on weekends. It is our understanding that the easement with Mercury Insurance will expire upon completion of the proposed Project, therefore, all of the project parking demands will be accommodated on-site. The proposed Project includes a mixed-use development that consists of 21,355 SF of office space and 189 apartment units. Fifteen (15) of the proposed apartments are considered co-living units, which include five (5) 3-bedroom units and ten (10) four-bedroom units, therefore, to provide a conservative assessment, the co-living unit bedrooms have been counted as individual units for a total apartment count of 229 units. The proposed Project also includes a 387-space and 10 tandem stall parking structure on the northwest quadrant of the subject property. The implementation of the proposed Project would require the demolition of the existing 18,450 SF movie theatre (Brea Plaza 5 Cinemas) and result in the overall loss of 116 surface parking spaces.

  Vehicular access to Brea Plaza is currently provided via one (1) right-turn only and one (1) full access unsignalized driveways on Associated Road, and a right-turn only driveway on Imperial Highway, and the signalized intersection of Imperial Highway at SR-57 NB Ramps/Brea Plaza. No change in access to Brea Plaza is proposed as a part of the Project. Further, with the exception of the parking and circulation layout on the northwest corner of the site where the proposed Project will be constructed, no changes to the internal circulation and primary parking layout in the center and southern portion of the site will change. To maintain circulation around the entire property, the Project does propose to maintain/construct a "Fire Lane" along the northern and western edge of the Project thereby providing emergency vehicle as well as Project-related traffic the ability to circulate the entire site to access either Associated Road or Imperial Highway.

- ***Study Scope*** – Nine (9) study intersections have been identified for evaluation in collaboration with City of Brea staff. The nine (9) intersections listed below provide regional and local access to the study area and define the extent of the boundaries for this traffic analysis, as well as identifies the governing jurisdiction. It should be noted that intersections that border Brea but are under the governing jurisdiction of Caltrans show the City in parentheses [i.e. (Brea)].

  Study Intersections – Jurisdiction (City)

  1. SR-57 SB Ramps at Imperial Highway - Caltrans (Brea)
  2. SR-57 NB Ramps/Brea Plaza Driveway 1 at Imperial Highway -Caltrans (Brea)
  3. S. Associated Road at Birch Street - Brea
  4. S. Associated Road at Greenbriar Lane - Brea

5. S. Associated Road at Imperial Highway – Caltrans (Brea)
6. Castlegate Lane/Placentia Avenue at Imperial Highway – Caltrans (Brea)
7. S. Associated Road at Brea Plaza Driveway 2 - Brea
8. S. Associated Road at Brea Plaza Driveway 3 - Brea
9. Brea Plaza Driveway 4 at Imperial Highway – Caltrans (Brea)

- ***Existing Traffic Conditions ICU*** – All of the signalized study intersections currently operate at acceptable service levels during the weekday AM and PM peak hours.

- ***Existing Traffic Conditions HCM*** – All of the study intersections currently operate at acceptable service levels during the weekday AM and PM peak hours.

- ***Project Trip Generation*** – A fully occupied Brea Plaza is forecast to generate approximately 8,963 daily trips, with 202 trips (126 inbound, 76 outbound) produced in the AM peak hour and 576 trips (283 inbound, 293 outbound) produced in the PM peak hour on a "typical" weekday, and 12,644 daily trips with 1,261 trips (646 inbound, 615 outbound) produced in the Midday peak hour on a "typical" Saturday.

  The trip generation associated with Brea Plaza upon implementation of the proposed Project is forecast to generate approximately 7,283 daily trips, with 302 trips (165 inbound, 137 outbound) produced in the AM peak hour and 516 trips (250 inbound, 266 outbound) produced in the PM peak hour on a "typical" weekday, and 10,362 daily trips with 772 trips (370 inbound, 402 outbound) produced in the Midday peak hour on a "typical" Saturday.

  When the existing Brea Plaza is compared to the retail center with the proposed Project, the implementation of the proposed Project is forecast result in 1,680 *fewer* weekday daily trips, 100 *more* weekday AM peak hour trips, and 60 *fewer* weekday PM peak hour trips, as well as 2,282 *fewer* Saturday daily trips, and 489 *fewer* Saturday midday peak hour trips. As a result, a Saturday analysis is not recommended. Therefore, this traffic analysis will be based on the net AM peak hour and PM peak hour project trips.

- ***Related Projects Traffic Characteristics –*** Fourteen (14) related projects were considered as part of the cumulative background setting. The fourteen (14) related projects on a weekday daily and peak hour basis. As shown, the related projects are expected to generate 35,920 weekday daily trips, with 2,713 trips (1,312 inbound, 1,401 outbound) anticipated during the AM peak hour and 3,274 trips (1,709 inbound, 1,565 outbound) produced during the PM peak hour.

- ***Year 2024 Cumulative Traffic Conditions Plus Project ICU*** – All of the signalized study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours with the addition of proposed Project traffic to Year 2024 cumulative traffic.

- ***Year 2024 Cumulative Traffic Conditions Plus Project HCM*** – All of the study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours with the addition proposed Project traffic to Year 2024 cumulative traffic.

Although the intersection of Brea Plaza Driveway 4/Imperial Highway (Intersection #9) was operating adversely under Year 2024 cumulative traffic conditions, the addition of the proposed Project traffic results in a reduction in delay in the PM peak hour. The reduction in delay is due to the negative net project volumes during the PM peak hour.

- ***Year 2045 General Plan Buildout Traffic Conditions Plus Project ICU*** – All of the signalized study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours with the addition of proposed Project traffic to Year 2045 General Plan Buildout traffic.

- ***Year 2045 General Plan Buildout Traffic Conditions Plus Project HCM*** – One (1) intersection is forecast to operate adversely during the AM and/or PM peak hours with the addition of proposed Project traffic to Year 2045 General Plan Buildout traffic. The remaining study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours. The intersection operating adversely includes the following:

	AM Peak Hour		PM Peak Hour	
Study Intersection	**Delay (s/v)**	**LOS**	**Delay (s/v)**	**LOS**
9. Brea Plaza Driveway 4 at Imperial Highway	--	--	38.8	E

The addition of proposed Project traffic at the intersection of Brea Plaza Driveway 4/Imperial Highway (Intersection #9) results in a reduction in delay in the PM peak hour. The reduction in delay is due to the negative net project volumes during the PM peak hour. Therefore, Project-related improvements at this location are not required based on the criteria defined in this report.

- ***Year 2024 Cumulative Traffic Conditions Plus Project Queueing*** – The queues for the nine (9) study intersections are considered adequate with the addition of proposed project traffic to Year 2024 Cumulative traffic. Furthermore, review of SR-57 NB Ramps/Brea Plaza Driveway 1/Imperial Highway (Intersection #2) indicates that the proposed Project will not adversely affect the queues at the intersection or adversely contribute to the potential weaving along Imperial Highway between the SR-57 NB On-Ramp and Brea Plaza Driveway 1.

- ***Year 2045 General Plan Buildout Traffic Conditions Plus Project Queueing*** – The queues for the nine (9) study intersections are considered adequate with the addition of proposed project traffic to Year 2045 General Plan Buildout traffic. Furthermore, review of SR-57 NB Ramps/Brea Plaza Driveway 1/Imperial Highway (Intersection #2) indicates that the proposed Project will not adversely affect the queues at the intersection or adversely contribute to the potential weaving along Imperial Highway between the SR-57 NB On-Ramp and Brea Plaza Driveway 1.

- ***Imperial Highway Intersection Safety Evaluation*** – It is our understanding that Caltrans has implemented improvements at intersections along Imperial Highway within the recent years which generally include traffic signal upgrades and ADA improvements. Five years of collision history has been researched via the Statewide Integrated Traffic Records System (SWITRS); the data was compiled from May 2016 through May 2021. When taking into consideration the total

number of collisions that occur within the project study area, the number of collisions along Imperial Highway have generally declined within the last five years. Therefore, it can be concluded that the improvements implemented at these intersections have played a role in reducing the collision frequency and has generally helped increase safety at the locations

- ***Intersection Safety Enhancements at S. Associated Road at Birch Street*** – The City has raised concerns regarding bicycle safety at the intersection of S. Associated Road at Birch Street. It is our understanding that the eastbound right-turn movement at the intersection currently experiences high traffic volumes due to the existing Brea Plaza center. Vehicles are required to cross the existing bike lane in order to complete the turn movement which creates a safety issue for bicyclists traveling eastbound. Therefore, to increase bicycle safety as well as improve traffic flow, it is recommended to implement the following improvements:

  - Intersection No. 3 – S. Associated Road at Birch Street: Restripe the west leg to provide an exclusive eastbound right-turn pocket with 150-feet of storage and a 4-foot bike lane located to the left of the turn pocket. Modify the existing traffic signal to allow for an eastbound right-turn overlap phase and replace the existing R73-5(CA) sign for the northbound left-turn lanes with a R73-6(CA) sign to restrict U-turns in the northbound direction. These improvements are subject to the approval of the City of Brea and are recommended as a condition of approval for the proposed Project.

  The intersection is forecast to operate at acceptable level of service during the weekday AM and PM peak hours with the improvements and will also improve service levels at the intersection. Additionally, the eastbound right-turn queues at the intersection can be accommodated within the proposed storage of 150 feet.

- ***Driveway 3 Traffic Signal Warrant Analysis –*** S. Associated Road at Brea Plaza Driveway 3 does not satisfy the criteria for a traffic signal. Furthermore, review of the level of service results indicates that the intersection is forecast to operate at acceptable level of service without the installation of a traffic signal. Therefore, the installation of a traffic signal the intersection is not recommended.

- ***Internal Circulation Evaluation –*** Access to the project site will continue to be served by the existing Brea Plaza driveways including the signalized intersection of Imperial Highway at SR-57 NB Ramps/Brea Plaza (Intersection #2), a right-turn only driveway on Associated Road (Intersection #7), a full access unsignalized driveway on Associated Road (Intersection #8), and a right-turn only driveway on Imperial Highway (Intersection #9). Since there are no changes proposed at any of the driveways as part of the proposed Project, it is assumed that trash trucks, delivery trucks, and fire trucks will continue to access the Project site without any issues. Additionally, based on our review of the proposed site plan, the overall layout does not create any unsafe vehicle-pedestrian conflict points and the driveway throating is sufficient such that access to parking spaces is not impacted by internal vehicle queuing/stacking. The on-site circulation is adequate based on our review of the proposed site plan, whereas the alignment, spacing, and throating of the Project driveways is adequate. The circulation around the buildings is adequate with sufficient sight distance along the drive aisles.

- ***Project-Specific Improvements*** – The following improvements are recommended as a condition of approval for the proposed Project in order to increase bicycle safety as well as improve traffic flow at the intersection of S. Associated Road at Birch Street:

  - Intersection No. 3 – S. Associated Road at Birch Street: Restripe the west leg to provide an exclusive eastbound right-turn pocket with 150-feet of storage and a 4-foot bike lane located to the left of the turn pocket. Modify the existing traffic signal to allow for an eastbound right-turn overlap phase and replace the existing R73-5(CA) sign for the northbound left-turn lanes with a R73-6(CA) sign to restrict U-turns in the northbound direction. These improvements are subject to the approval of the City of Brea and are recommended as a condition of approval for the proposed Project.

- ***Year 2024 Cumulative Plus Project Recommended Improvements*** – None of the nine (9) study intersections are forecast to exceed the LOS criteria thresholds under Year 2024 Cumulative Plus Project traffic conditions. Therefore, Project-related improvements are not required or recommended.
- ***Year 2045 General Plan Buildout Plus Project Recommended Improvements*** – None of the nine (9) study intersections are forecast to exceed the LOS criteria thresholds under Year 2045 General Plan Buildout Plus Project traffic conditions. Therefore, Project-related improvements are not required or recommended.
- ***Traffic Impact Fees*** – Subject to confirmation by City staff, the proposed Project's Traffic Impact Fee totals $260,852.75 based on a net increase of 21,355 SF of office uses along with 229 high density residential units (i.e. 21,355 SF x $1.25 per SF = $26,693.75 and 229 DU x $1,203 per DU = $275,487.00). Since fees have already been paid towards the existing theater which will be removed a credit of $41,328.00 could be taken (i.e. 18,450 SF x $2.24 = $41,328.00). The precise fee will be determined upon issuance of Project building permits by the City of Brea Community Development Department.

- ***CMP Compliance Assessment –*** The proposed Project is forecast to generate -1,680 weekday net daily trip-ends and therefore a CMP analysis is not required.

APPENDIX A

TRAFFIC STUDY SCOPE OF WORK

MEMORANDUM

To:	Dave Roseman, P.E., City Traffic Engineer City of Brea	Date:	April 7, 2021
From:	Richard E. Barretto, P.E., Principal Linscott, Law & Greenspan, Engineers	LLG Ref:	2.19.4157.1
Subject:	***Revised Circulation Assessment Scope of Work for Brea Plaza Expansion Project Brea, California***		

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit the following Revised Scope of Work for the Circulation Assessment for the proposed Brea Plaza Expansion Project in the City of Brea for your review and approval. It is our understanding that a Circulation Assessment is required to provide consistency with the General Plan. The work program summarized below is based on our current experience within the City and prior coordination efforts with City staff.

Circulation Assessment Scope of Work

A. Project Location: Brea Plaza is an existing retail center addressed at 409-477 S. Associated Road & 1555, 1609, 1623, 1643 E. Imperial Highway that is generally located north of Imperial Highway, west of Associated Road, and east of SR-57 Freeway in the City of Brea, California. ***Figure 1-1*** presents a Vicinity Map that illustrates the general location of the Project and surrounding street system. ***Figure 2-1*** is an existing aerial photograph of the Project site.

B. Project Description: ***Table 2-1*** summarizes the proposed Project development. The existing Brea Plaza includes 165,329 square-feet (SF) of floor area consisting of mixture of retail/commercial use, service/retail shops, a movie theatre, restaurant/ food uses and fast-food restaurants with drive-through. Parking for the retail center currently totals 725 on-site spaces with an additional 180 spaces available in an easement with Mercury Insurance during business hours and all spaces after 5:00 PM and on weekends. It is our understanding that the easement with Mercury Insurance will expire soon. Therefore, all of the project parking demands will be accommodated on-site. Vehicular access to Brea Plaza is now provided via a right-turn only and a full access driveway on Associated Road, and a right-turn only on Imperial Highway plus the signalized intersection of Imperial Highway at SR-57 NB ramps/Brea Plaza.

The proposed Project includes a mixed-use development that consists of 21,355 SF of office space and 189 apartment units. Fifteen (15) of the proposed apartments are considered co-living units, which include five (5) 3-bedroom units and ten (10) four-bedroom units, therefore, to provide a conservative assessment, the co-living unit bedrooms have been counted as individual units for a total apartment count of 229 units. The proposed Project also includes a 387-space

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and 10 tandem stall parking structure on the northwest quadrant of the subject property. The implementation of the Project would require the demolition of the existing 18,450 SF movie theatre (Brea Plaza 5 Cinemas) and result in the overall loss of 116 surface parking spaces. ***Figure 2-2*** illustrates the conceptual site plan for the Project prepared by Architects Orange, dated February 10, 2021.

C. Traffic Study Locations: The following thirteen (13) key study intersections have been identified, based on coordination with the City, for which the Project's potential traffic impact is to be assessed.

Key Study Intersections

1. Brea Boulevard at Imperial Highway (Brea/Caltrans)
2. State College Boulevard at Birch Street (Brea)
3. State College Boulevard at Imperial Highway (Brea/Caltrans)
4. SR-57 SB Ramps at Imperial Highway (Brea/Caltrans)
5. SR-57 NB Ramps/Brea Plaza at Imperial Highway (Brea/Caltrans)
6. S. Associated Road at Birch Street (Brea)
7. S. Associated Road at Greenbriar Lane (Brea)
8. S. Associated Road at Imperial Highway (Brea/Caltrans)
9. Kraemer Boulevard at Imperial Highway (Brea/Caltrans)
10. Placentia Avenue at Imperial Highway (Brea/Caltrans)
11. S. Associated Road at Brea Plaza Right-turn only Driveway (Brea)
12. S. Associated Road at Brea Plaza Full access Driveway (Brea)
13. Brea Plaza Right-turn only Driveway at Imperial Highway (Brea/Caltrans)

However, inconsideration of the City's "50 peak hour trip" threshold, only two (2) of the potential study locations, SR-57 SB Ramps at Imperial Highway (No. 4) and SR-57 NB Ramps/Brea Plaza at Imperial Highway (No. 5), meets the criteria and hence would warrant evaluation. Given the proximity of the following nine (9) study locations are recommended for evaluation. Subject to confirmation by the City Traffic Engineer, Level of Service (LOS) calculations would be prepared at these locations.:

4. SR-57 SB Ramps at Imperial Highway (Brea/Caltrans)
5. SR-57 NB Ramps/Brea Plaza at Imperial Highway (Brea/Caltrans)
6. S. Associated Road at Birch Street (Brea)
7. S. Associated Road at Greenbriar Lane (Brea)
8. S. Associated Road at Imperial Highway (Brea/Caltrans)
10. Placentia Avenue at Imperial Highway (Brea/Caltrans)

11. S. Associated Road at Brea Plaza Right-turn only Driveway (Brea)
12. S. Associated Road at Brea Plaza Full access Driveway (Brea)
13. Brea Plaza Right-turn only Driveway at Imperial Highway (Brea/Caltrans)

The remaining four (4) locations do not meet the "50 peak hour trip" threshold and would not warrant analysis, subject to review/confirmation by City staff (See ***Table 5-2*** for added project-related traffic volumes). Of the nine (9) recommended study locations, five (5) locations are under Caltrans jurisdiction. *Figure 1-1* identifies the study locations.

D. Traffic Counts: Based on current conditions, due to COVID-19 virus, the ability to collect traffic counts to establish baseline conditions is not possible. As such, to establish existing "baseline" traffic conditions, pre-COVID-19, LLG has researched historical data and was able to obtain Year 2018/2019 counts at five (5) of the nine key study locations. ***Table 1*** presents a summary of the study intersections with available historical data.

Given the availability of historical data, LLG proposes the following to establish pre-COVID-19 traffic conditions:

(1) Historic data is available at five (5) locations for Year 2018/2019.

(2) Given data is not available at one (1) study location (Intersection #7 – not including the existing Brea Plaza driveways), LLG collected Year 2020 Covid-19 traffic counts at the study location, as well as intersections adjacent to the missing intersections, in October 2020 for use in establishing traffic counts/turning movement percentages. *Table 1* indicates the intersections which required new count collection.

(3) Using information from (1) and (2), compare 2018/2019 to 2020 to establish change in traffic counts due to current COVID-19 environment.

(4) Apply the rate calculated in (3) to 2020 COVID-19 traffic counts and forecast 2018/2019 traffic conditions at the one (1) missing intersection (Intersection #7).

(5) Lastly, apply an annual growth factor of 1% per year to the Year 2018/2019 traffic conditions to establish Year 2021 pre-COVID-19 baseline traffic conditions.

Additionally, the existing ingress and egress volumes for the Brea Plaza driveways (Intersections 5, 11, 12 and 13) will be based on forecasted trips for the existing center rather than applying adjustments in place of collecting traffic counts.

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E. Project Traffic Generation: The trip generation potential of the proposed Project will be estimated using trip rates contained in the 10th Edition of *Trip Generation,* published by the Institute of Transportation Engineers (ITE), [Washington, D.C., 2017].

Table 5-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project based on the entire Brea Plaza retail center and also presents the project's forecast peak hour and daily traffic volumes. As shown in the upper portion of *Table 5-1,* ITE Land Use 221: Multifamily Housing (Mid-Rise), ITE 444: Movie Theater, ITE 710: General Office Building, and ITE 820: Shopping Center trip rates will be used to forecast the trip generation potential of the Project, as well as the trip generation potential of a fully occupied existing Brea Plaza.

A review of the middle portion of *Table 5-1* indicates that a fully occupied Brea Plaza is forecast to generate approximately 8,963 daily trips, with 202 trips (126 inbound, 76 outbound) produced in the AM peak hour and 576 trips (283 inbound, 293 outbound) produced in the PM peak hour on a "typical" weekday, and 12,644 daily trips with 1,261 trips (646 inbound, 615 outbound) produced in the Midday peak hour on a "typical" Saturday.

A review of the lower portion of *Table 5-1* indicates that the trip generation associated with Brea Plaza upon implementation of the proposed Project is forecast to generate approximately 7,283 daily trips, with 302 trips (165 inbound, 137 outbound) produced in the AM peak hour and 516 trips (250 inbound, 266 outbound) produced in the PM peak hour on a "typical" weekday, and 10,362 daily trips with 772 trips (370 inbound, 402 outbound) produced in the Midday peak hour on a "typical" Saturday.

When the existing Brea Plaza is compared to the retail center with the proposed Project, the implementation of the proposed Project is forecast result in 1,680 *fewer* weekday daily trips, 100 *more* weekday AM peak hour trips, and 60 *fewer* weekday PM peak hour trips, as well as 2,282 *fewer* Saturday daily trips, and 489 *fewer* Saturday midday trips. As a result of trips documented in *Table 5-1,* which identifies changes to the Saturday daily and peak hour trips, a Saturday analysis is not recommended.

F. Project Trip Distribution Pattern: See attached ***Figures 5-1*** through ***5-4*** for the Project Trip Distribution for the existing retail land uses, proposed retail land uses, proposed residential, and proposed office, respectively, for review by the

City. The project trip distributions have been distributed and assigned to the adjacent street system based on the following considerations:

- location of site access points in relation to the surrounding street system,
- the site's proximity to major traffic carriers and regional access routes,
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- presence of traffic congestion in the surrounding vicinity, and
- ingress/egress availability at the project site.

Table 5-2 summarizes the added Project-related AM peak hour and PM peak hour traffic volumes at the initial thirteen (13) potential study locations.

G. Near-Term Cumulative Background Traffic:

- Project Completion Year: 2024 (to be confirmed by the City/Project Applicant)
- Ambient Growth Rate: 1% per year
- Cumulative Projects: Planned and/or approved projects will be researched at the City of Brea and adjacent jurisdictions (i.e. Fullerton, La Habra, Yorba Linda, and Placentia).

H. General Plan Buildout Traffic: General Plan Buildout (Year 2045) traffic volume forecasts will be developed based on OCTAM 5.0 approved computer traffic model runs for baseline conditions and buildout conditions for the AM and PM peak periods and daily traffic conditions. Forecast future buildout traffic volumes using the following methodology:

a. Peak period traffic volumes will be converted to peak hour (i.e., one-hour) traffic volumes using a conversion factor of 0.3566 for the AM peak hour and 0.2662 for the PM peak hour;
b. Calculate the difference between the baseline and buildout peak period traffic volumes and convert to AM and PM peak hour (i.e., one-hour) link traffic volumes;
c. Link traffic volumes (i.e., two-way directional traffic volumes on each roadway segment) will be post-processed using the “b-turns” program and the relationship of the base year validation model run output to the base year "ground" traffic counts to develop buildout AM and PM peak hour traffic volumes.

I. Analysis Scenarios: Prepare AM and PM peak hour Level of Service (LOS) calculations at the nine (9) key study intersections to determine the potential impacts of the proposed Project. The following traffic scenarios will be prepared.

1. Existing (Year 2021) Traffic Conditions;
2. Near-Term (Year 2024) Background Traffic Conditions (Existing plus Ambient Growth plus Related Projects);
3. Near-Term (Year 2024) Background Plus Project Traffic Conditions;
4. Scenario (5) with improvements to be implemented as conditions of approval (COA), if necessary;
5. General Plan Buildout[1] (Year 2045) Traffic Conditions;
6. General Plan Buildout (Year 2045) Plus Project Traffic Conditions; and
7. Scenario (8) with improvements to be implemented as conditions of approval (COA), if necessary.

J. LOS Methodology: The LOS calculations will be based on the HCM 6th Edition methodology for both signalized and unsignalized intersections to be consistent with the City of Brea Transportation Impact Analysis (TIA) Guidelines. Additionally, the LOS calculations will also be based on the Intersection Capacity Utilization (ICU) methodology for signalized intersections to be consistent with the City of Brea General Plan.

The HCM calculations will utilize the following parameters:

- Utilization of exiting cycle length and pedestrian timing parameters,
- Minimum left-turn split time, including clearance interval timing = 10 seconds
- Saturation flow rates:
  - Thru and Right-turns = 1,900 vehicles per hour (vph)
  - Left-turns = Single Lane: 1,800 vph, Dual Lanes = 3,500 vph

The ICU calculations will utilize the following parameters:

- Lane capacity of 1,700 vph for through and all turn lanes with a clearance adjustment factor of 0.05

Subject to confirmation by the City Traffic Engineer, the following LOS review criteria will be used to assess the need for potential Project-related improvements in relation to the guidance provided in the City of Brea General Plan:

- HCM Methodology:
  - The Project causes one or more study intersections operating at LOS D or better to degrade to LOS E or F, or
  - The Project causes a change in control delay of 4 seconds for intersections already operating at LOS E, or
  - The Project causes a change in control delay of 2 seconds for intersections already operating at LOS F.

[1] It should be noted that the General Plan Buildout assessment has been included since the proposed Project would require an amendment to the General Plan to accommodate a change is Zoning to allow for residential uses.

- ICU Methodology:
  - The Project causes an intersection operating at LOS D or better to degrade to LOS E or F, or
  - The Project increases traffic demand at a signalized study intersection by 0.020 or greater and the intersection is forecast to operate at LOS E or F.

K. Other Issues:

- Evaluate site access and internal circulation of the proposed Project.
- Conduct a safety evaluation at all key study intersections which will include 5 years of collision history data. Recommend physical and/or timing changes to improve safety where applicable.
- Conduct a queuing evaluation at all key study intersections located along Imperial Highway and Associated Road, inclusive of the SR-57 off-ramps to Imperial Highway to address potential Caltrans concerns/comments.
- Perform an active transportation facilities assessment of the near-by roadways as it relates to pedestrian mobility and bicycle mobility.
- Provide documentation of existing near-by transit facilities and transit routes that provide services to the site.
- Since the project driveway on Imperial Highway is approximately 150 feet from the SR-57 NB On-ramp, conduct an operations weaving assessment between driveway and freeway on-ramp for the westbound direction of Imperial Highway. This weaving assessment will be conducted via Synchro 10.0.
- Prepare a standalone VMT screening memo.

L. OCTA NOP Comments: The comments have been reviewed and the contents of this scope of work adequately addresses all comments.

M. City of Fullerton NOP Comments: The comments have been reviewed and the contents of this scope of work have been updated to address all comments. However, the City of Fullerton has requested for LOS analyses to include intersections along Associated Road and State College Boulevard, between Imperial Highway and CSU Fullerton. Review of the project's trip generation and trip distribution patterns indicate that intersections along those roadways would not satisfy the 50-trip threshold criteria. Therefore, project trips at these intersections are considered

nominal and have not been included in the scope of work. Language will be added to the report to further discuss why these intersections were excluded from analysis.

N. Caltrans NOP Comments: The comments have been reviewed and the contents of this scope of work have been updated to address all comments.

O. Neighborhood Scoping Meeting Comments: The comments have been reviewed and the contents of this scope of work adequately addresses all comments. As it relates to congestion along Imperial Highway resulting in cut-through traffic along Associated Road and Castlegate/Placentia, this is believed to be an existing issue that currently happens. Therefore, the analysis at the key study intersections will identify if additional improvements are needed to satisfy existing and future traffic demands.

* * * * * * * * * *

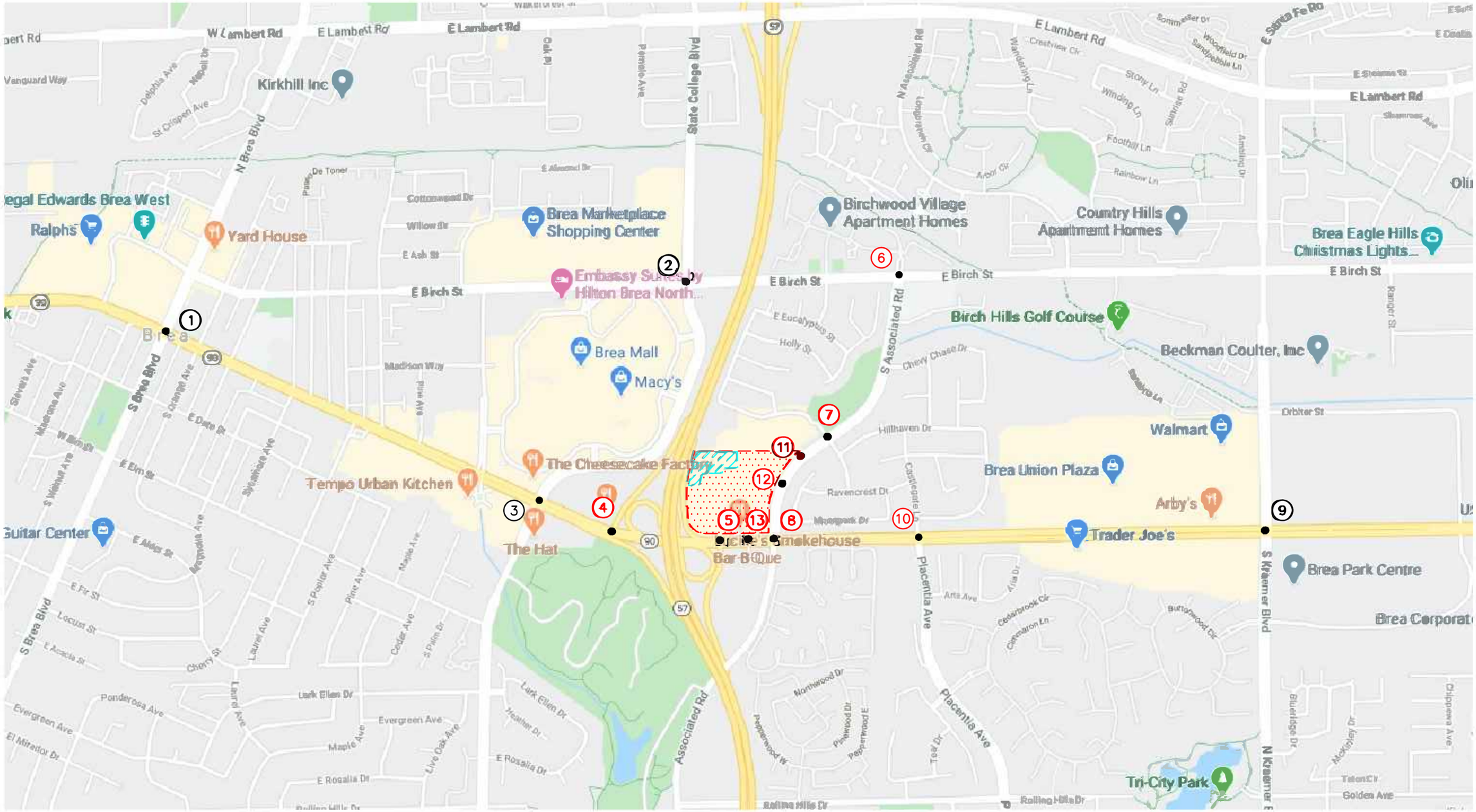
We appreciate the opportunity to provide this scope of work. Should you have any questions, please call us at (949)825-6175. Thank you.

Approved by:

_____ _____

City of Brea Date

cc. File
Shane Green, P.E., LLG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N Brea Blvd
State College Blvd
Vanguard Way
Delphia Ave
St Crispen Ave
Pamela Ave
Oak Pl
De Toner
Cottonwood Dr
Willow Dr
E Ash St
E Birch St
Egal Edwards Brea West
Ralphs
Yard House
Brea Marketplace
Shopping Center
Embassy Suites by
Hilton Brea North...
Brea Mall
Macy's
Madison Way
Rimsdale Ave
S Brea Blvd
S Orchard Ave
E Date St
Stevens Ave
Melrose Ave
W Birch St
E Elm St
Tempo Urban Kitchen
The Cheesecake Factory
The Hat
Guitar Center
E Miles St
Wanda Ave
E Fir St
Locust St
E Acacia St
Cherry St
Laurel Ave
S Poplar Ave
Pine Ave
Maple Ave
Cedar Ave
S Palm Dr
Ponderosa Ave
Evergreen Ave
El Mirador Dr
Lark Ellen Dr
Heather Dr
E Rosalia Dr
Live Oak Ave
Associated Rd
Rolling Hills Dr
Northwood Dr
Peppertree Dr
Pinetree Dr
Placentia Ave
Trail Dr
Birchwood Village
Apartment Homes
Country Hills
Apartment Homes
E Birch St
S Associated Rd
E Eucalyptus St
Holly St
Chevy Chase Dr
Birch Hills Golf Course
Beckman Coulter, Inc
Walmart
Hillhaven Dr
Brea Union Plaza
Ravencrest Dr
Castlegate Ln
Mystpark Dr
Arby's
Trader Joe's
Bubba's Smokehouse
Bar B Que
Cedarbrook Cir
Cinnamon Ln
Anita Ave
Arita Dr
Burlingwood Dr
S Kraemer Blvd
Brea Park Centre
Brea Corporat
Tri-City Park
Bluefield Dr
Mckinley Dr
Talon Dr
Golden Ave
Chippewa Ave
Sommerset Dr
Woodfield Dr
Sandpebble Ln
E Santa Fe Rd
E Sierra St
Shamrock Ave
Crestview Dr
Wandering Ln
Stony Ln
Winding Ln
Sunrise Rd
Foothill Ln
Rainbow Ln
Amelia Dr
Arbol Dr
N Associated Rd
Longbranch Ln
Brea Eagle Hills
Christmas Lights...
Ranger St
Orbiter St
Sequoia Ln
Eucalyptus Ave
Brea Blvd
Brea Blvd
Brea Blvd

n:\4100\2194157 – brea plaza expansion project, brea\dwg\4157 f2-1.dwg LDP 13:52:01 03-17-2021 lam

SOURCE: GOOGLE

KEY

= STUDY INTERSECTION

= BREA PLAZA

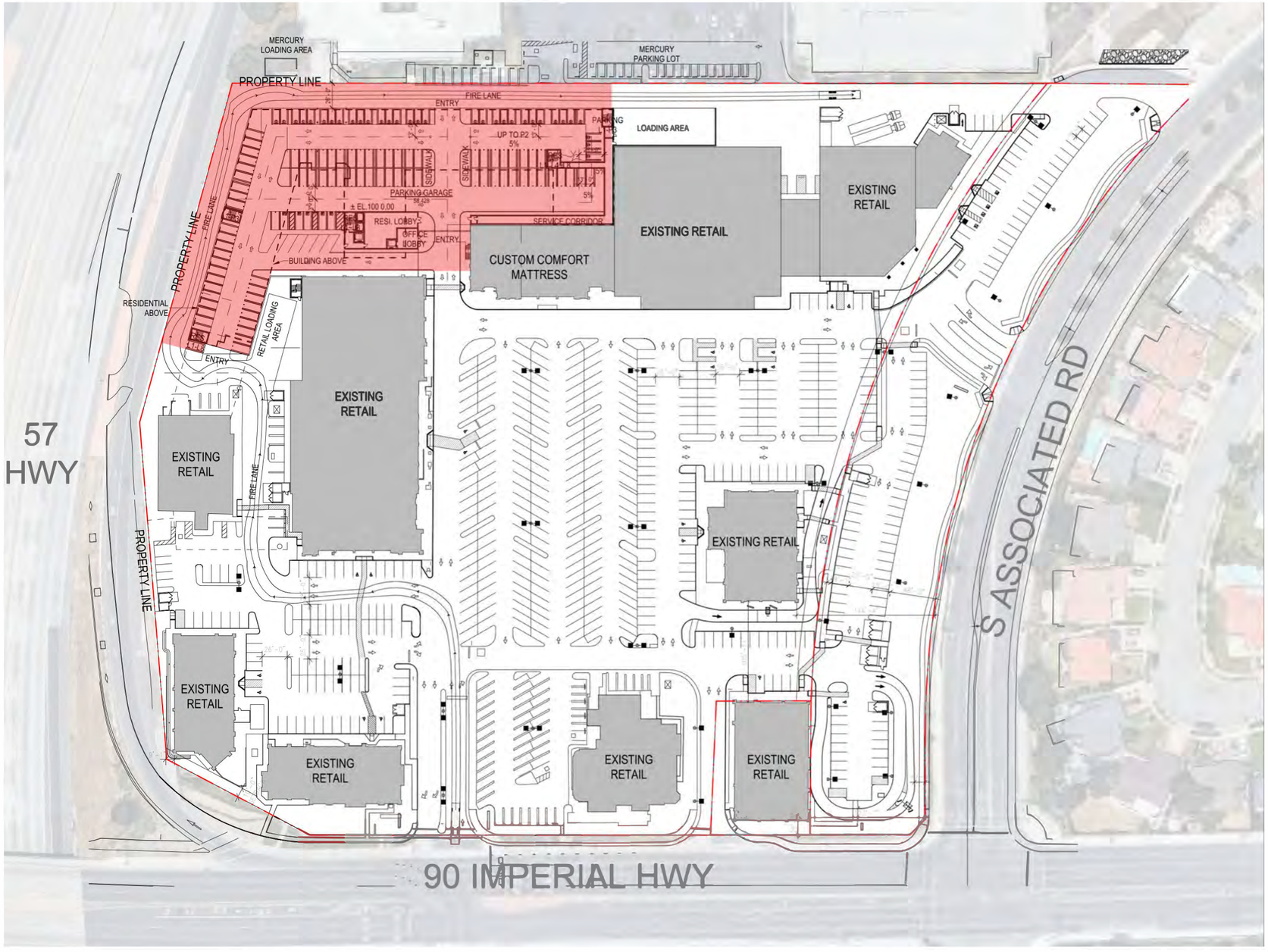
= PROJECT AREA

NO SCALE

FIGURE 2-1

EXISTING SITE AERIAL

BREA PLAZA EXPANSION PROJECT, BREA



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SOURCE: ARCHITECTS ORANGE

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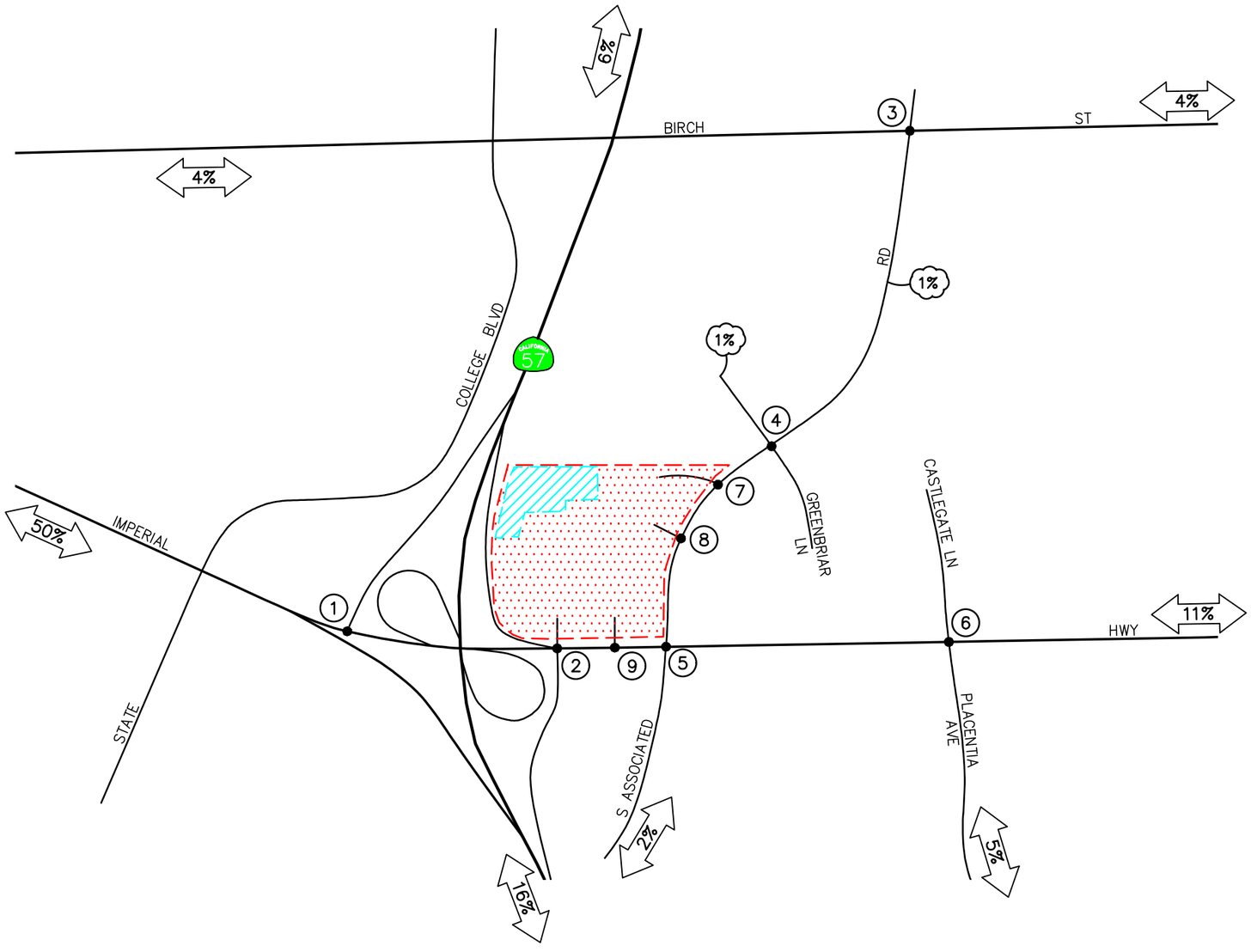
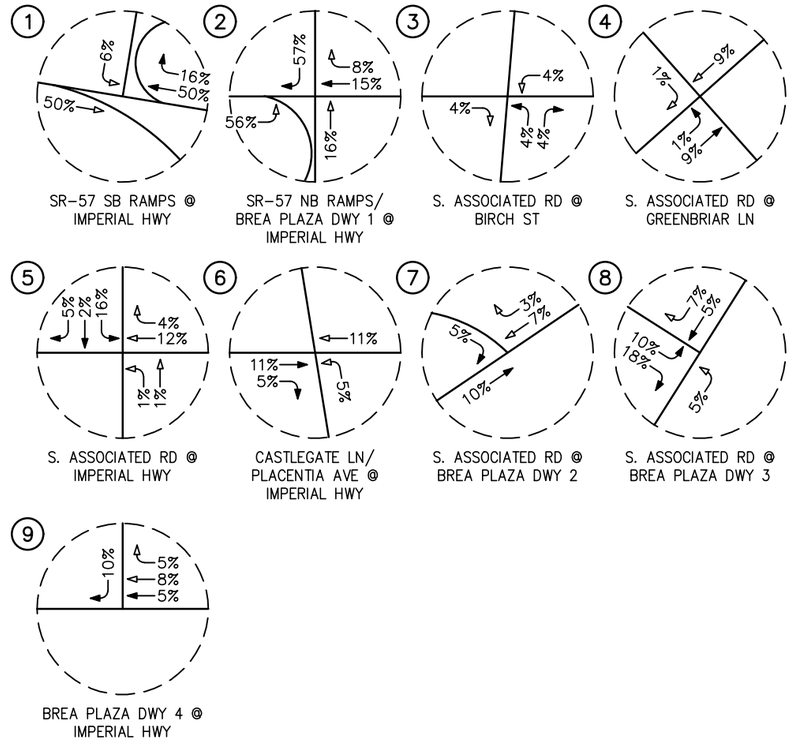
N NO SCALE

FIGURE 2-2

PROPOSED SITE PLAN

BREA PLAZA EXPANSION PROJECT, BREA





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N NO SCALE

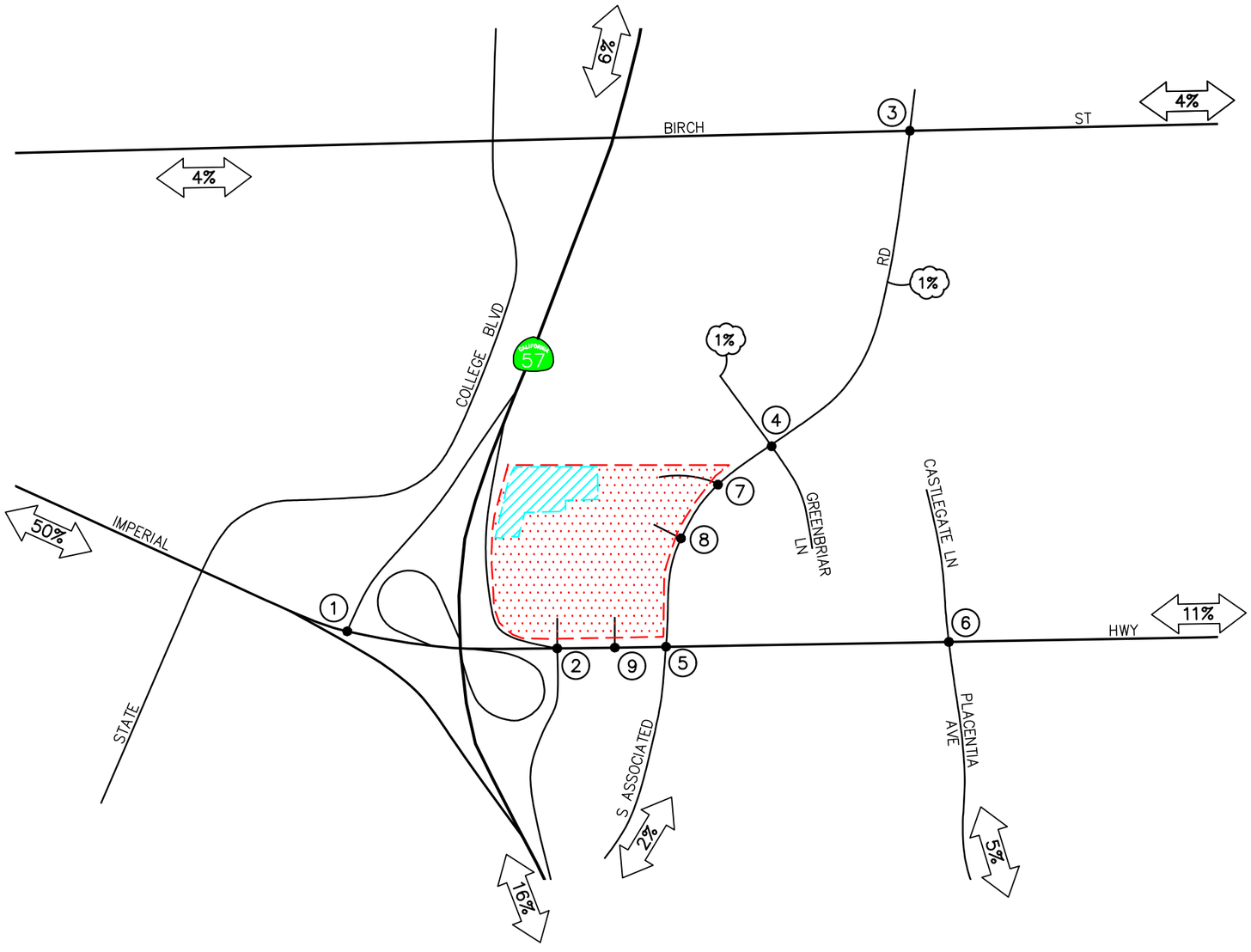
KEY

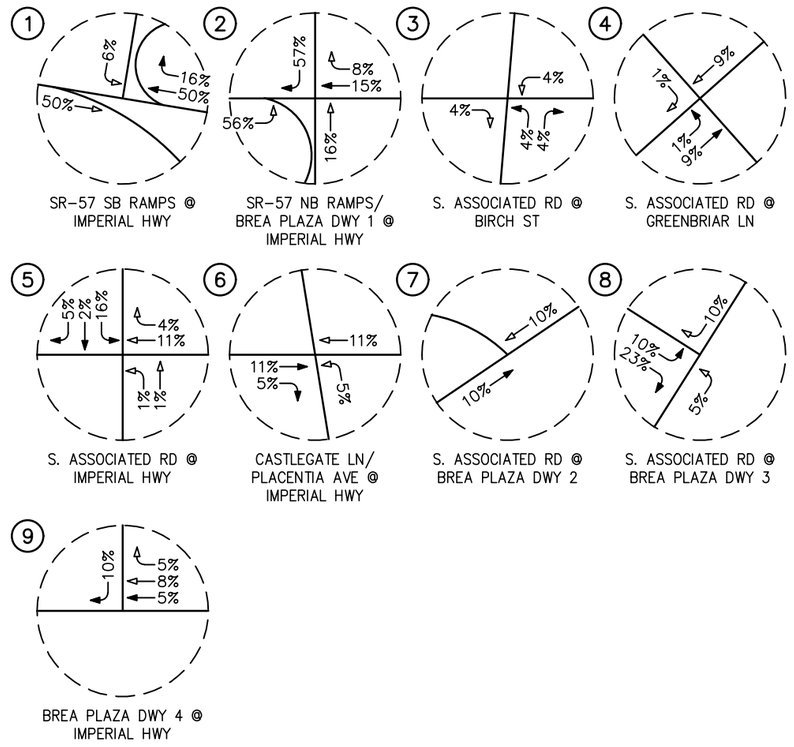
- (#) = STUDY INTERSECTION
- ⟵ = INBOUND PERCENTAGE
- ⟵ = OUTBOUND PERCENTAGE
- = BREA PLAZA
- = PROJECT AREA

FIGURE 5-1

PROJECT TRAFFIC DISTRIBUTION PATTERN – EXISTING RETAIL

BREA PLAZA EXPANSION PROJECT, BREA





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N NO SCALE

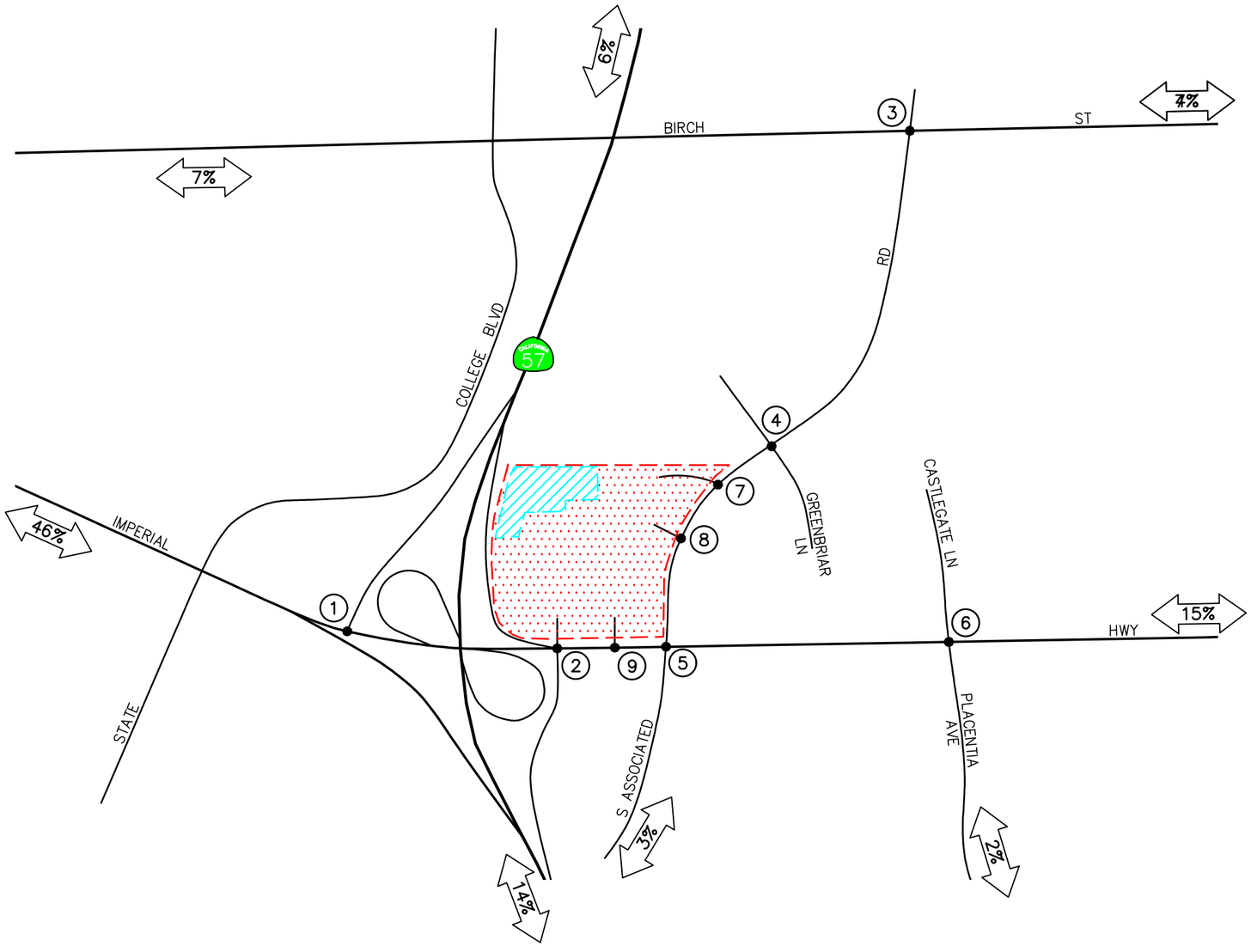
KEY

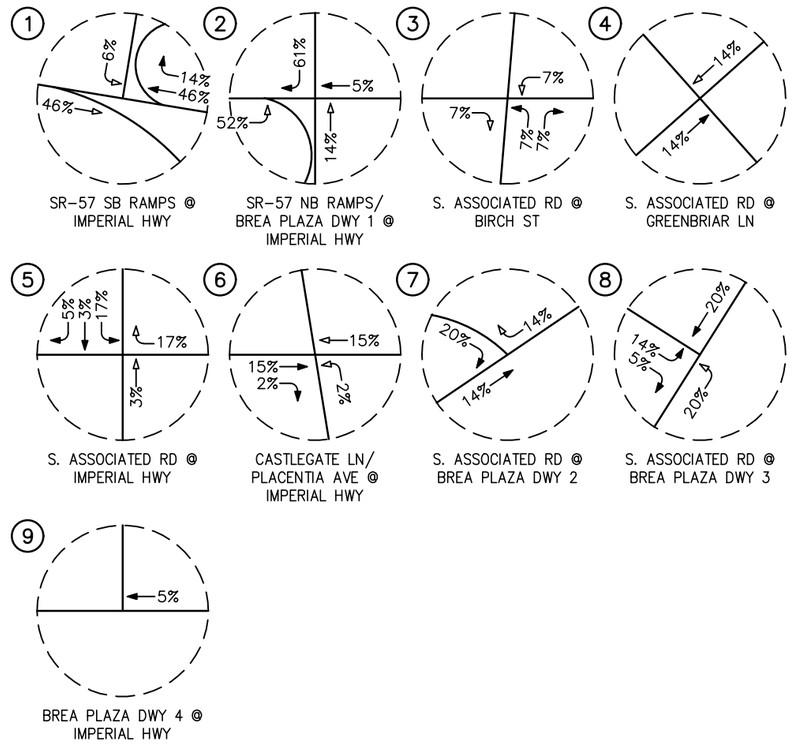
(#) = STUDY INTERSECTION
← = INBOUND PERCENTAGE
← = OUTBOUND PERCENTAGE
= BREA PLAZA
= PROJECT AREA

FIGURE 5-2

PROJECT TRAFFIC DISTRIBUTION PATTERN – PROPOSED RETAIL

BREA PLAZA EXPANSION PROJECT, BREA





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N NO SCALE

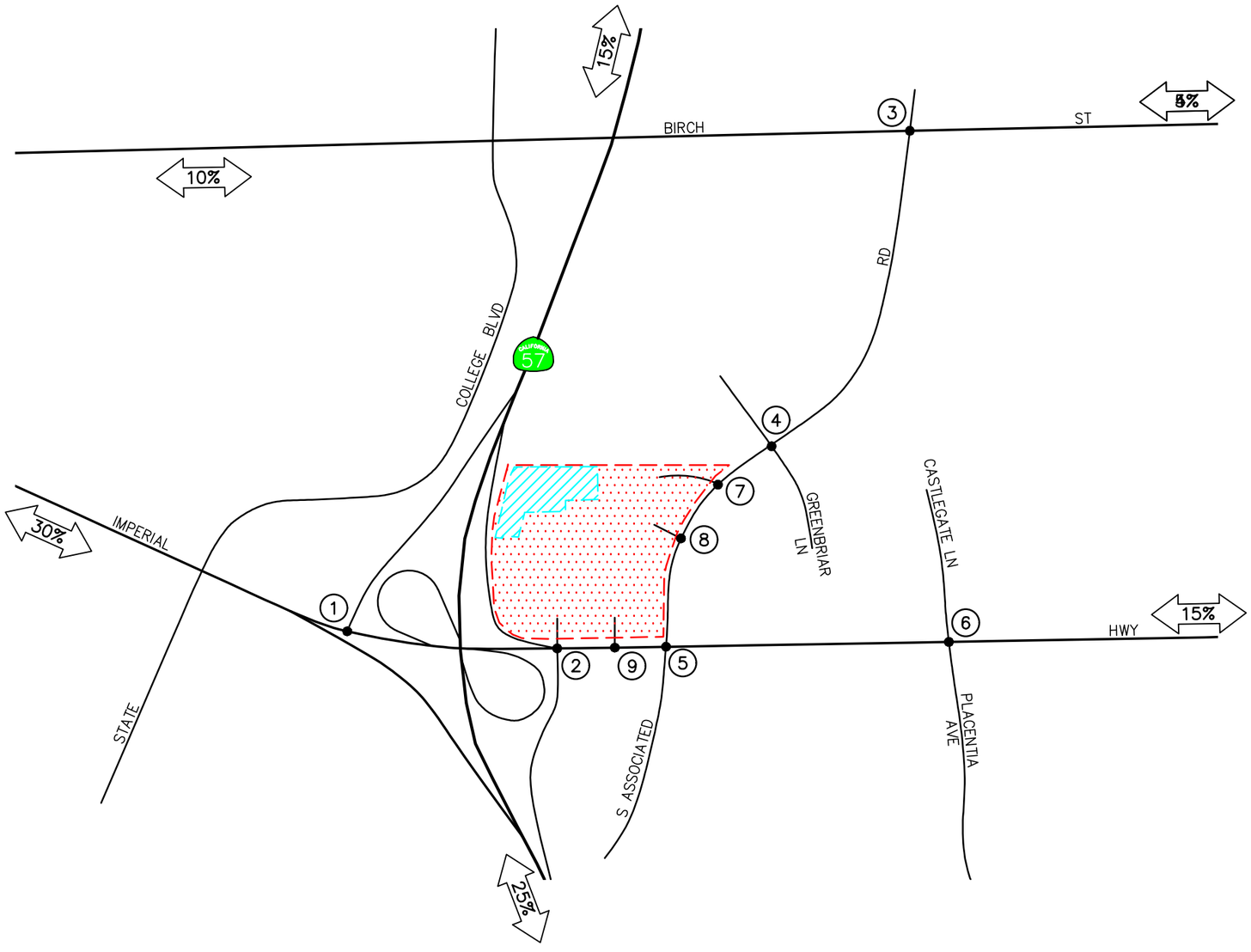
KEY

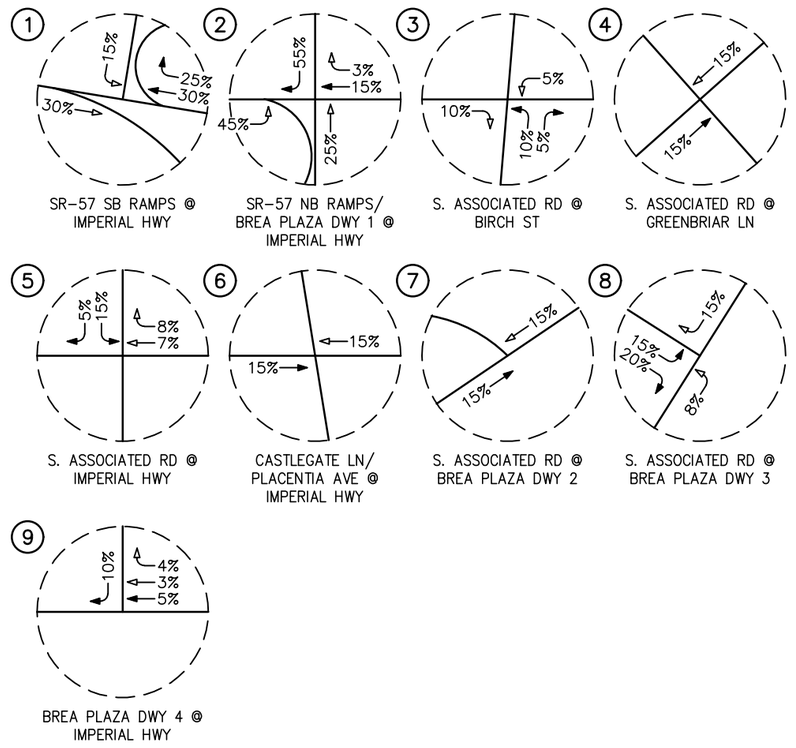
- (#) = STUDY INTERSECTION
- ⟵ = INBOUND PERCENTAGE
- ⟵ = OUTBOUND PERCENTAGE
- = BREA PLAZA
- = PROJECT AREA

FIGURE 5-3

PROJECT TRAFFIC DISTRIBUTION PATTERN – RESIDENTIAL

BREA PLAZA EXPANSION PROJECT, BREA





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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

- (#) = STUDY INTERSECTION
- ⟵ = INBOUND PERCENTAGE
- ⟵ = OUTBOUND PERCENTAGE
- = BREA PLAZA
- = PROJECT AREA

FIGURE 5-4

PROJECT TRAFFIC DISTRIBUTION PATTERN – OFFICE

BREA PLAZA EXPANSION PROJECT, BREA

LINSCOTT LAW & GREENSPAN engineers

TABLE 1

EXISTING TRAFFIC COUNT SUMMARY

Key Study Intersections	Historical Year 2018/2019 Counts Available?	Collect Year 2020 COVID-19 Counts?
4. SR-57 SB Ramps at Imperial Highway	Yes	--
5. SR-57 NB Ramps/Brea Plaza at Imperial Highway	Yes	--
6. S. Associated Road at Birch Street	Yes	--
7. S. Associated Road at Greenbriar Lane	**No**	**Yes**
8. S. Associated Road at Imperial Highway	Yes	**Yes**
10. Placentia Avenue at Imperial Highway	Yes	**Yes**
11. S. Associated Road at Brea Plaza Right-turn only Driveway	**No**	--
12. S. Associated Road at Brea Plaza Full access Driveway	**No**	--
13. Brea Plaza Right-turn only Driveway at Imperial Highway	**No**	--

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TABLE 2-1
PROJECT DEVELOPMENT SUMMARY[2]

Project Description	(1) Existing Site	(2) Demolition	(3) New Construction	(4) Total Updated Site
Land Use				
▪ Residential Apartments	--	--	229 DU[3]	229 DU[3]
▪ Office	--	--	21,355 SF	21,355 SF
▪ Medical Office	1,596 SF	--	--	1,596 SF
▪ Restaurants	42,649 SF	--	--	42,649 SF
▪ Movie Theater (1,100 seats with 5 screens)	18,450 SF	18,450 SF	--	--
▪ Grocery Store	16,206 SF	--	--	16,206 SF
▪ Retail	68,415 SF	--	--	68,415 SF
▪ Liquor Store	18,013 SF	--	--	18,013 SF
Total Project	**165,329 SF**	**18,450 SF**	**229 DU and 21,355 SF**	**229 DU and 168,234 SF**
Parking				
▪ 3-Level Parking Structure	--		387 spaces and 10 tandem stalls	387 spaces and 10 tandem stalls
▪ Surface Parking	725 spaces[4]	116 spaces	--	609 spaces
Total Parking	**725 spaces**	**116 spaces**	**387 spaces and 10 tandem stalls**	**996 spaces and 10 tandem stalls**

2 Project development summary is based on project site plan prepared by Architects Orange, dated February 10, 2021.

3 There is a total of 189 apartment units. A portion of the proposed apartments are considered co-living units, which include five (5) 3-bedroom units and ten (10) 4-bedroom units. Therefore, to provide a conservative assessment, the co-living unit bedrooms have been counted as individual units for a total apartment count of 229 units.

4 Currently, there are a total of 725 parking stalls plus an additional 180 spaces during business hours and all surface spaces after 5PM and weekend through an easement with Mercury Insurance. However, the easement with Mercury Insurance will no longer be applicable as part of the proposed Project and all of the project parking demands will be accommodated on-site.

TABLE 5-1

PROJECT TRIP GENERATION FORECAST – ENTIRE BREA PLAZA[5]

Project Description	Weekday							Saturday			
	Daily	AM Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
	2-Way	Enter	Exit	Total	Enter	Exit	Total	2-Way	Enter	Exit	Total
Trip Generation Rates											
▪ 221: Multifamily Housing (Mid-Rise) (TE/DU)	5.44	26%	74%	0.36	61%	39%	0.44	4.91	49%	51%	0.44
▪ 444: Movie Theater (TE/Seat)	1.76	--	--	--	55%	45%	0.09	2.24	56%	44%	0.46
▪ 710: General Office Building (TE/TSF)	9.74	86%	14%	1.16	16%	84%	1.15	2.21	54%	46%	0.53
▪ 820: Shopping Center (TE/TSF GLA)	Eq.[6]	62%	38%	Eq.[6]	48%	52%	Eq.[6]	Eq.[6]	52%	48%	Eq.[6]
Existing Brea Plaza											
▪ Existing Shopping Center (146,879 SF)	7,808	140	85	225	347	375	722	11,311	403	436	839
Pass-by Reduction[7]	-781	-14	-9	-23	-118	-127	-245	-1,131	-40	-44	-84
Existing Shopping Center Total	**7,027**	**126**	**76**	**202**	**229**	**248**	**477**	**10,180**	**363**	**392**	**755**
▪ Existing Theater (1,100 seats)	1,936	--	--	--	54	45	99	2,464	283	223	506
Existing Brea Plaza Total	**8,963**	**126**	**76**	**202**	**283**	**293**	**576**	**12,644**	**646**	**615**	**1,261**
Proposed Brea Plaza											
▪ Proposed Shopping Center (146,879 SF)	7,808	140	85	225	347	375	722	11,311	403	436	839
Internal Capture[8]	-602	-2	-1	-3	-20	-30	-50	-507	-23	-25	-48
Subtotal	7,206	138	84	222	327	345	672	10,804	380	411	791
Pass-by Reduction[7]	-721	-14	-8	-22	-111	-117	-228	-1,080	-38	-41	-79
Proposed Shopping Center Total	**6,485**	**124**	**76**	**200**	**216**	**228**	**444**	**9,724**	**342**	**370**	**712**
▪ Proposed Residential (229 DU)	1,246	21	61	82	62	39	101	1,124	49	52	101
Internal Capture[8]	-576	0	-2	-2	-29	-18	-47	-508	-23	-24	-47
Proposed Residential Total	**670**	**21**	**59**	**80**	**33**	**21**	**54**	**616**	**26**	**28**	**54**
▪ Proposed Office (21,355 SF)	208	22	3	25	4	21	25	47	6	5	11
Internal Capture[8]	-80	-2	-1	-3	-3	-4	-7	-25	-4	-1	-5
Proposed Office Total	**128**	**20**	**2**	**22**	**1**	**17**	**18**	**22**	**2**	**4**	**6**
Proposed Brea Plaza Total	**7,283**	**165**	**137**	**302**	**250**	**266**	**516**	**10,362**	**370**	**402**	**772**
Net Trip Generation (Proposed Brea Plaza - Existing Brea Plaza)	**-1,680**	**39**	**61**	**100**	**-33**	**-27**	**-60**	**-2,282**	**-276**	**-213**	**-489**

5 Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).

6 Trip Generation rates based on the following equations:
- Weekday Daily: Ln(T) = 0.68Ln(X) + 5.57
- Weekday AM Peak Hour: T = 0.50(X) + 151.78
- Weekday PM Peak Hour: Ln(T) = 0.74Ln(X) + 2.89
- Saturday Daily: Ln(T) = 0.62Ln(X) + 6.24
- Saturday Peak Hour of Generator: Ln(T) = 0.79Ln(X) + 2.79

7 Pass-By Trips are trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on adjacent streets, which contain direct access to the generator. For this analysis, the following pass-by reduction factors were used (Source: *Trip Generation Handbook,3rd Edition*, ITE 2017):
- 820: Shopping Center: PM Peak Hour – 34%, Daily/AM peak hour/Saturday Daily/Saturday Midday Peak Hour – Assume 10%

8 Consistent with the *Trip Generation Handbook,* published by ITE (2017), Project trip generation was adjusted to account for internal capture between the retail and residential components of the Project. As there are no Saturday internal capture worksheets available, Weekday Daily and Weekday PM peak hour calculations have been applied to Saturday Daily and Saturday Midday peak hour.

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TABLE 5-2

PROJECT-RELATED ADDED PEAK HOUR TRAFFIC VOLUMES

Key Intersections	Jurisdiction	City Study Location Peak Hour "Threshold"	Time Period	Added Peak Hour Project Trips	Exceed "50 peak hour trip" threshold (Yes/No)
1. Brea Boulevard at Imperial Highway	Brea/ Caltrans	50 peak hour trips	AM PM	22 -26	No No
2. State College Boulevard at Birch Street	Brea	50 peak hour trips	AM PM	7 -2	No No
3. State College Boulevard at Imperial Highway	Brea/ Caltrans	50 peak hour trips	AM PM	42 -36	No No
4. SR-57 SB Ramps at Imperial Highway	Brea/ Caltrans	50 peak hour trips	AM PM	**55** -43	**Yes** No
5. SR-57 NB Ramps/Brea Plaza at Imperial Highway	Brea/ Caltrans	50 peak hour trips	AM PM	**68** -58	**Yes** No
6. S. Associated Road at Birch Street	Brea	50 peak hour trips	AM PM	13 -1	No No
7. S. Associated Road at Greenbriar Lane	Brea	50 peak hour trips	AM PM	14 -2	No No
8. S. Associated Road at Imperial Highway	Brea/ Caltrans	50 peak hour trips	AM PM	21 -12	No No
9. Kraemer Boulevard at Imperial Highway	Brea/ Caltrans	50 peak hour trips	AM PM	12 -4	No No
10. Placentia Avenue at Imperial Highway	Brea/ Caltrans	50 peak hour trips	AM PM	16 -9	No No
11. S. Associated Road at Brea Plaza Right-turn only Driveway	Brea	50 peak hour trips	AM PM	21 -12	No No
12. S. Associated Road at Brea Plaza Full access Driveway	Brea	50 peak hour trips	AM PM	33 -4	No No
13. Brea Plaza Right-turn only Driveway at Imperial Highway	Brea/ Caltrans	50 peak hour trips	AM PM	4 -14	No No

APPENDIX B

EXISTING TRAFFIC COUNT DATA

APPENDIX B-I

EXISTING (YEAR 2021) VOLUME DEVELOPMENT SUMMARY

Table B-1
Year 2021 Pre-COVID-19 Baseline Volume Development

Study Intersection	(1) 2018 AM Intersection Volume	(2) 2018 PM Intersection Volume	(3) 2020 COVID-19 AM Volume	(4) 2020 COVID-19 PM Volume	(5) 2020 COVID-19 AM Growth Per Year (%) [1]	(6) 2020 COVID-19 PM Growth Per Year (%) [2]	(7) 2018 Adjusted AM Intersection Volume [3]	(8) 2018 Adjusted PM Intersection Volume [4]	(9) 2018 Baseline AM Intersection Volume	(10) 2018 Baseline PM Intersection Volume	(11) 2021 Baseline AM Intersection Volume by applying 1% per year to Column 9	(12) 2021 Baseline PM Intersection Volume by applying 1% per year to Column 10
1. SR-57 SB Ramps at Imperial Highway	--	--	--	--	--	--	--	--	--	--	--	--
2. SR-57 NB Ramps/Brea Plaza at Imperial Highway	--	--	--	--	--	--	--	--	--	--	--	--
3. S. Associated Road at Birch Street	--	--	--	--	--	--	--	--	--	--	--	--
4. S. Associated Road at Greenbriar Lane	--	--	710	1,093	--	--	987	1,215	987	1,215	1,017	1,251
5. S. Associated Road at Imperial Highway	4,533	5,195	3,278	4,637	-19.1%	-6.0%	--	--	4,533	5,195	4,669	5,351
6. Placentia Avenue at Imperial Highway	3,906	4,478	2,792	4,062	-19.9%	-5.1%	--	--	3,906	4,478	4,023	4,612
Average Growth Rate Per Year					**-19.5%**	**-5.6%**						

Notes:

[1] [(Column 3 - Column 1)/Column 3] / (2020-2018)

[2] [(Column 4 - Column 2)/Column 4] / (2020-2018)

[3] 2018 Adjusted Volumes were developed by applying the average growth rate per year calculated in Column 5.
Column 3 + [Column 3 × (19.5% × (2020 - 2018))]

[4] 2018 Adjusted Volumes were developed by applying the average growth rate per year calculated in Column 6.
Column 4 + [Column 4 × (5.6% × (2020 - 2018))]

APPENDIX B-II

HISTORIC COUNTS

National Data & Surveying Services

Intersection Turning Movement Count

Location: SR-57 SB Ramps & Imperial Hwy
City: Brea
Control: Signalized

Project ID: 19-01101-015
Date: 5/22/2019

Total

NS/EW Streets:	SR-57 SB Ramps				SR-57 SB Ramps				Imperial Hwy				Imperial Hwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1.5	0	1.5	0	0	3	1	0	0	3	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	145	0	89	0	0	316	142	0	0	305	30	0	1027
7:15 AM	0	0	0	0	145	0	107	0	0	343	138	0	0	363	35	0	1131
7:30 AM	0	0	0	0	164	0	115	0	0	367	158	0	0	417	43	0	1264
7:45 AM	0	0	0	0	123	0	128	0	0	312	155	0	0	391	35	0	1144
8:00 AM	0	0	0	0	115	0	86	0	0	317	156	0	0	387	58	0	1119
8:15 AM	0	0	0	0	102	0	83	0	0	328	162	0	0	328	47	0	1050
8:30 AM	0	0	0	0	89	0	80	0	0	326	130	0	0	332	64	0	1021
8:45 AM	0	0	0	0	102	0	99	0	0	284	105	0	0	394	61	0	1045
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	985	0	787	0	0	2593	1146	0	0	2917	373	0	8801
APPROACH %'s :					55.59%	0.00%	44.41%	0.00%	0.00%	69.35%	30.65%	0.00%	0.00%	88.66%	11.34%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	0	0	0	0	547	0	436	0	0	1339	607	0	0	1558	171	0	4658
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.834	0.000	0.852	0.000	0.000	0.912	0.960	0.000	0.000	0.934	0.737	0.000	0.921
					0.881				0.927				0.940				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1.5	0	1.5	0	0	3	1	0	0	3	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	131	0	102	0	0	340	161	0	0	527	111	0	1372
4:15 PM	0	0	0	0	142	0	108	0	0	385	134	0	0	459	104	0	1332
4:30 PM	0	0	0	0	102	0	97	0	0	343	169	0	0	502	101	0	1314
4:45 PM	0	0	0	0	129	0	117	0	0	327	175	0	0	522	137	0	1407
5:00 PM	0	0	0	0	150	0	135	0	0	345	248	0	0	517	100	0	1495
5:15 PM	0	0	0	0	169	0	127	0	0	411	213	0	0	496	86	0	1502
5:30 PM	0	0	0	0	161	0	120	0	0	396	194	0	0	507	82	0	1460
5:45 PM	0	0	0	0	140	0	110	0	0	384	190	0	0	518	100	0	1442
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1124	0	916	0	0	2931	1484	0	0	4048	821	0	11324
APPROACH %'s :					55.10%	0.00%	44.90%	0.00%	0.00%	66.39%	33.61%	0.00%	0.00%	83.14%	16.86%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	620	0	492	0	0	1536	845	0	0	2038	368	0	5899
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.917	0.000	0.911	0.000	0.000	0.934	0.852	0.000	0.000	0.984	0.920	0.000	0.982
					0.939				0.954				0.973				

Prepared by National Data & Surveying Services

SR-57 SB Ramps & Imperial Hwy

Peak Hour Turning Movement Count

ID: 19-01101-015
City: Brea

Day: Wednesday
Date: 05/22/2019

PEAK HOURS	COUNT PERIODS
07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

SR-57 SB Ramps — SOUTHBOUND

AM	436	0	547	0	171	AM
NOON	0	0	0	0	0	NOON
PM	492	0	620	0	368	PM
	1.5	0	1.5	0		

Imperial Hwy — EASTBOUND

AM	NOON	PM	
1994	0	2530	⇦
0	0	0	0 ↶
0	0	0	0 ↱
1339	0	1536	3 →
607	0	845	1 ↳
AM	NOON	PM	

CONTROL

Signalized

TEV	4658	0	5899
	AM	NOON	PM
PHF	0.92		0.98

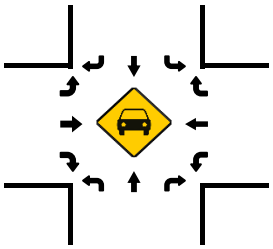
Imperial Hwy — WESTBOUND

PM	NOON	AM	
368	0	171	1 ↰
2038	0	1558	3 ←
0	0	0	0 ↰
0	0	0	0 ↶
2156	0	1886	⇨
PM	NOON	AM	

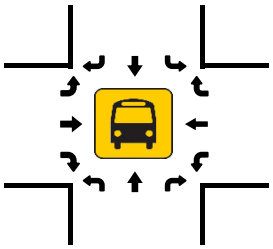
SR-57 SB Ramps — NORTHBOUND

PM	845	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	607	0	0	0	0	AM
		0	0	0	0	

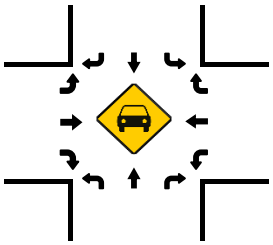
Total Vehicles (AM)



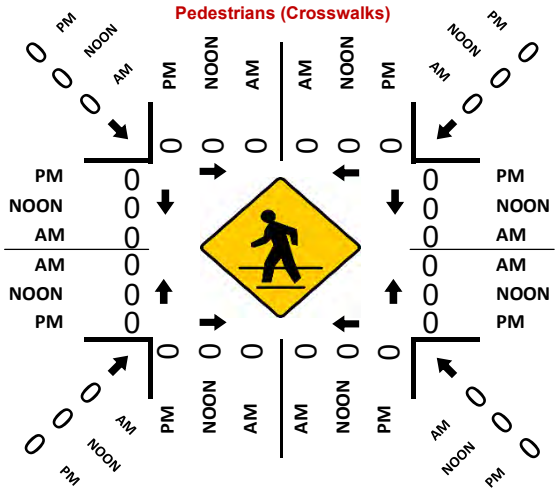
Total Vehicles (AM)



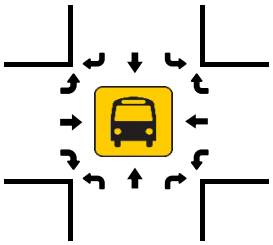
Total Vehicles (NOON)



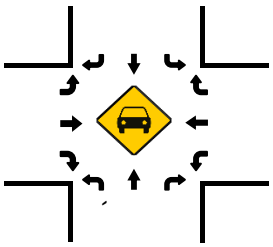
Pedestrians (Crosswalks)



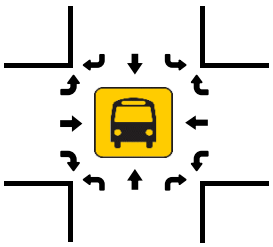
Total Vehicles (NOON)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: SR-57 NB Ramps & Imperial Hwy
City: Brea
Control: Signalized

Project ID: 19-01101-016
Date: 5/22/2019

Total

NS/EW Streets:	SR-57 NB Ramps					SR-57 NB Ramps					Imperial Hwy					Imperial Hwy									
AM	NORTHBOUND					SOUTHBOUND					EASTBOUND					WESTBOUND					SOUTHBOUND2				
	2.3	0.3	1.3	0	0	0	0	2	0	0	1	3	1	0	0	0	4	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
7:00 AM	152	46	165	0	0	0	0	14	0	6	23	318	132	0	0	0	167	3	0	125	0	0	0	0	0	1151
7:15 AM	207	50	192	0	0	0	0	16	0	17	29	312	133	0	0	0	177	2	0	105	0	0	0	0	0	1240
7:30 AM	245	50	173	0	0	0	0	12	0	9	34	366	133	0	0	0	203	3	0	119	0	0	0	0	0	1347
7:45 AM	174	43	204	0	1	0	0	12	0	7	65	264	122	0	0	0	240	1	0	111	0	0	0	0	0	1244
8:00 AM	160	24	177	0	0	0	0	12	0	5	24	275	117	0	0	0	253	0	0	120	0	0	0	0	0	1167
8:15 AM	187	24	187	0	1	0	0	12	0	13	15	302	109	0	0	0	200	3	0	124	0	0	0	0	0	1177
8:30 AM	171	34	212	0	1	0	0	18	0	5	29	274	116	0	0	0	203	3	0	108	0	0	0	0	0	1174
8:45 AM	223	28	203	0	0	0	0	15	0	9	39	242	97	0	0	0	226	4	0	93	0	0	0	0	0	1179
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
TOTAL VOLUMES :	1519	299	1513	0	3	0	0	111	0	71	258	2353	959	0	0	0	1669	19	0	905	0	0	0	0	0	9679
APPROACH %'s :	45.56%	8.97%	45.38%	0.00%	0.09%	0.00%	0.00%	60.99%	0.00%	39.01%	7.23%	65.91%	26.86%	0.00%	0.00%	0.00%	64.37%	0.73%	0.00%	34.90%						
PEAK HR :	07:15 AM - 08:15 AM																									TOTAL
PEAK HR VOL :	786	167	746	0	1	0	0	52	0	38	152	1217	505	0	0	0	873	6	0	455	0	0	0	0	0	4998
PEAK HR FACTOR :	0.802	0.835	0.914	0.000	0.250	0.000	0.000	0.813	0.000	0.559	0.585	0.831	0.949	0.000	0.000	0.000	0.863	0.500	0.000	0.948	0.000	0.000	0.000	0.000	0.000	0.928
			0.908					0.682					0.879					0.894							

PM	NORTHBOUND					SOUTHBOUND					EASTBOUND					WESTBOUND					SOUTHBOUND2				
	2.3	0.3	1.3	0	0	0	0	2	0	0	1	3	1	0	0	0	4	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
4:00 PM	258	15	128	0	1	0	0	51	0	8	38	392	44	0	0	0	327	9	0	88	0	0	0	0	0	1359
4:15 PM	195	12	112	0	2	0	0	30	0	14	37	417	70	0	0	0	345	14	0	133	0	0	0	0	0	1381
4:30 PM	188	21	117	0	1	0	0	39	0	13	48	358	63	0	0	0	371	6	0	149	0	0	0	0	0	1374
4:45 PM	215	26	120	0	3	0	0	51	0	17	45	327	55	0	0	0	393	11	0	174	0	0	0	0	0	1437
5:00 PM	200	6	125	0	6	0	0	51	0	15	40	394	79	0	0	0	366	8	0	176	0	0	0	0	0	1466
5:15 PM	205	15	84	0	6	0	0	37	0	18	43	425	99	0	0	0	332	12	0	201	0	0	0	0	0	1477
5:30 PM	208	16	82	0	4	0	0	59	0	10	47	422	80	0	0	0	347	8	0	180	0	0	0	0	0	1463
5:45 PM	200	22	98	0	2	0	0	41	0	13	52	396	80	0	0	0	360	15	0	181	0	0	0	0	0	1460
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
TOTAL VOLUMES :	1669	133	866	0	25	0	0	359	0	108	350	3131	570	0	0	0	2841	83	0	1282	0	0	0	0	0	11417
APPROACH %'s :	61.98%	4.94%	32.16%	0.00%	0.93%	0.00%	0.00%	76.87%	0.00%	23.13%	8.64%	77.29%	14.07%	0.00%	0.00%	0.00%	67.55%	1.97%	0.00%	30.48%						
PEAK HR :	05:00 PM - 06:00 PM																									TOTAL
PEAK HR VOL :	813	59	389	0	18	0	0	188	0	56	182	1637	338	0	0	0	1405	43	0	738	0	0	0	0	0	5866
PEAK HR FACTOR :	0.977	0.670	0.778	0.000	0.750	0.000	0.000	0.797	0.000	0.778	0.875	0.963	0.854	0.000	0.000	0.000	0.960	0.717	0.000	0.918	0.000	0.000	0.000	0.000	0.000	0.993
			0.949					0.884					0.951					0.983							

Prepared by National Data & Surveying Services

SR-57 NB Ramps & Imperial Hwy

Peak Hour Turning Movement Count

ID: 19-01101-016
City: Brea

Day: Wednesday
Date: 05/22/2019

PEAK HOURS	COUNT PERIODS
07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

SR-57 NB Ramps — SOUTHBOUND

AM	52	0	0	0	325 AM
NOON	0	0	0	0	0 NOON
PM	188	0	0	0	284 PM

EASTBOUND — Imperial Hwy

AM	NOON	PM	
1711	0	2406	⇦
0	0	0	0 ↶
152	0	182	1 ↱
1217	0	1637	3 →
505	0	338	1 ↳

WESTBOUND — Imperial Hwy

PM	NOON	AM	
43	0	6	0 ↶
1405	0	873	4 ←
0	0	0	0 ↰
0	0	0	0 ↩
2026	0	1963	⇨

CONTROL

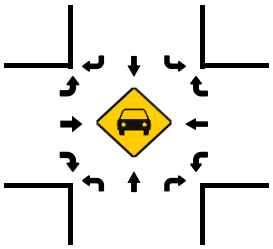
Signalized

TEV	4504 AM	0 NOON	5054 PM
PHF	0.93		0.99

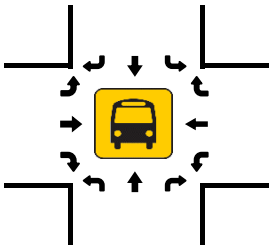
NORTHBOUND — SR-57 NB Ramps

PM	338	0	813	59	389 PM
NOON	0	0	0	0	0 NOON
AM	505	0	786	167	746 AM
		0 ↶	2.3 ↰	0.3 ↑	1.3 ↱

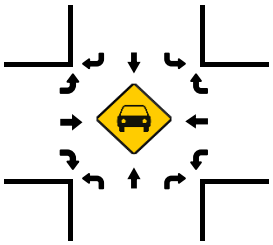
Total Vehicles (AM)



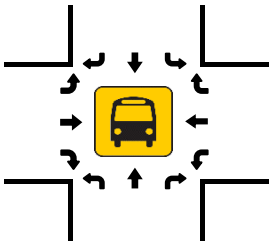
Total Vehicles (AM)



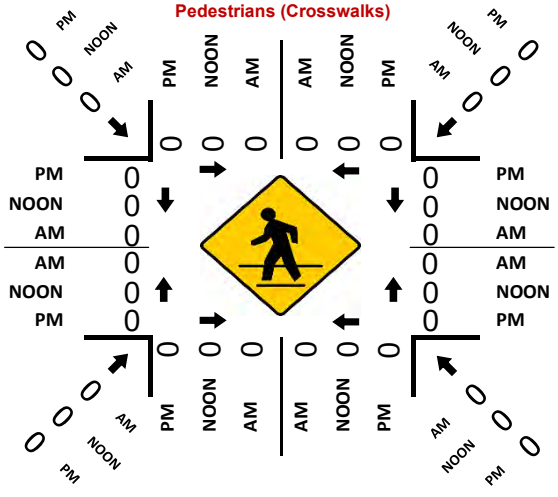
Total Vehicles (NOON)



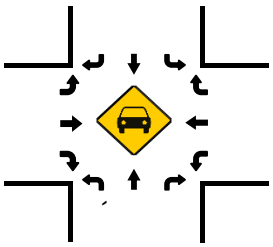
Total Vehicles (NOON)



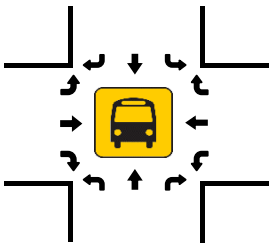
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: S Associated Rd & Birch St
City: Brea
Control: Signalized

Project ID: 18-01231-006
Date: 11/13/2018

Total

NS/EW Streets:	S Associated Rd				S Associated Rd				Birch St				Birch St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	1	1	0	1	1	0	0	1	2	0	0	2	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	20	0	51	4	5	4	0	0	0	155	71	0	74	88	1	0	473
7:15 AM	23	0	45	0	10	4	5	0	0	157	73	0	66	104	0	0	487
7:30 AM	40	1	58	7	9	13	3	0	1	220	86	0	80	134	4	0	656
7:45 AM	50	1	66	6	14	6	1	0	0	249	85	0	77	206	0	0	761
8:00 AM	47	3	69	10	6	3	2	0	0	228	68	0	84	194	1	0	715
8:15 AM	54	1	96	7	22	5	2	0	1	160	46	0	81	169	5	0	649
8:30 AM	53	1	47	8	5	3	2	0	3	99	52	0	75	120	3	0	471
8:45 AM	43	0	41	6	5	5	2	0	1	101	60	0	45	138	2	0	449
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	330	7	473	48	76	43	17	0	6	1369	541	0	582	1153	16	0	4661
APPROACH %'s :	38.46%	0.82%	55.13%	5.59%	55.88%	31.62%	12.50%	0.00%	0.31%	71.45%	28.24%	0.00%	33.24%	65.85%	0.91%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	191	6	289	30	51	27	8	0	2	857	285	0	322	703	10	0	2781
PEAK HR FACTOR :	0.884	0.500	0.753	0.750	0.580	0.519	0.667	0.000	0.500	0.860	0.828	0.000	0.958	0.853	0.500	0.000	0.914
			0.816				0.741				0.856				0.914		

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	1	1	0	1	1	0	0	1	2	0	0	2	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	81	4	56	2	2	2	2	0	0	167	58	1	66	199	6	0	646
4:15 PM	86	2	68	2	1	2	2	0	0	186	62	0	59	194	3	0	667
4:30 PM	99	4	67	3	3	1	1	0	0	200	60	0	60	260	5	0	763
4:45 PM	124	7	74	5	3	3	1	0	5	196	66	0	60	276	5	0	825
5:00 PM	120	9	77	4	2	6	2	0	1	196	76	1	76	279	5	0	854
5:15 PM	95	7	87	2	3	5	2	0	1	209	61	2	77	299	2	0	852
5:30 PM	81	7	85	3	2	4	1	0	2	203	67	0	54	288	4	0	801
5:45 PM	80	5	74	3	5	4	2	0	3	181	53	0	57	217	6	0	690
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	766	45	588	24	21	27	13	0	12	1538	503	4	509	2012	36	0	6098
APPROACH %'s :	53.83%	3.16%	41.32%	1.69%	34.43%	44.26%	21.31%	0.00%	0.58%	74.77%	24.45%	0.19%	19.91%	78.69%	1.41%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	420	30	323	14	10	18	6	0	9	804	270	3	267	1142	16	0	3332
PEAK HR FACTOR :	0.847	0.833	0.928	0.700	0.833	0.750	0.750	0.000	0.450	0.962	0.888	0.375	0.867	0.955	0.800	0.000	0.975
			0.937				0.850				0.991				0.942		

Prepared by National Data & Surveying Services

S Associated Rd & Birch St

Peak Hour Turning Movement Count

ID: 18-01231-006
City: Brea

Day: Tuesday
Date: 11/13/2018

PEAK HOURS

AM: 07:30 AM - 08:30 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

S Associated Rd

SOUTHBOUND

AM	8	27	51	0	18	AM
NOON	0	0	0	0	0	NOON
PM	6	18	10	0	55	PM

EASTBOUND (Birch St)

AM	NOON	PM		
902	0	1571	⇦	
0	0	3	↶	0
2	0	9	↱	1
857	0	804	→	2
285	0	270	↴	0

WESTBOUND (Birch St)

	PM	NOON	AM
0	16	0	10
2	1142	0	703
2	267	0	322
0	0	0	0
⇨	1137	0	1197

CONTROL

Signalized

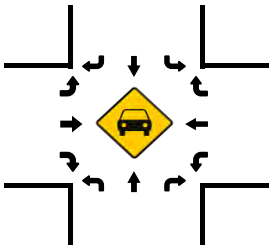
TEV	2781 AM	0 NOON	3332 PM
PHF	0.91		0.98

NORTHBOUND

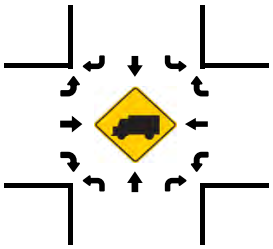
PM	569	14	420	30	323	PM
NOON	0	0	0	0	0	NOON
AM	664	30	191	6	289	AM

S Associated Rd

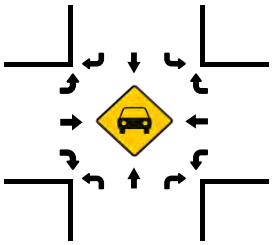
Total Vehicles (AM)



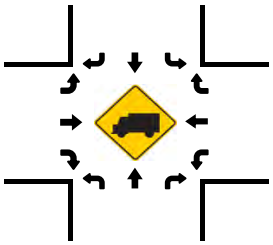
2axle (AM)



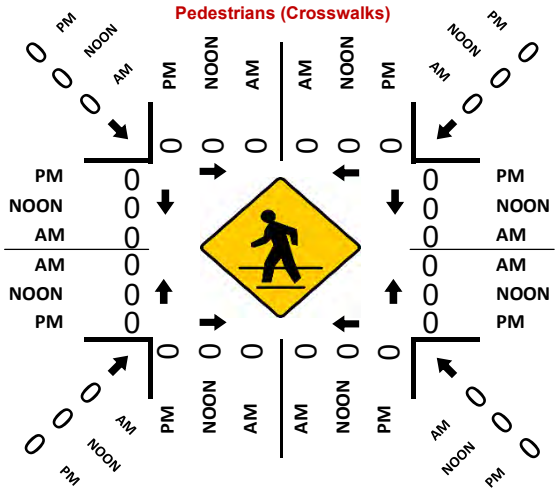
Total Vehicles (Noon)



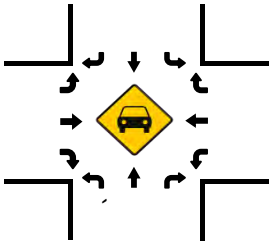
2axle (NOON)



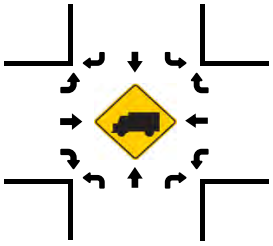
Pedestrians (Crosswalks)



Total Vehicles (PM)



2axle (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Associated Rd & Imperial Hwy
City: Brea
Control: Signalized

Project ID: 18-01231-009
Date: 11/13/2018

Total

NS/EW Streets:	Associated Rd				Associated Rd				Imperial Hwy				Imperial Hwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	2	0	0	2	1	1	0	1	3	0	0	1	4	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	34	29	10	0	27	78	24	0	35	385	21	0	15	278	10	0	946
7:15 AM	50	32	12	0	32	65	26	0	37	376	32	1	23	297	10	0	993
7:30 AM	33	44	13	0	24	86	37	0	32	386	27	1	20	347	17	0	1067
7:45 AM	28	62	21	0	29	66	31	0	38	464	29	0	12	388	22	0	1190
8:00 AM	43	47	15	0	47	68	34	1	38	422	17	0	23	378	21	0	1154
8:15 AM	32	39	17	0	36	85	33	1	29	435	19	0	30	348	18	0	1122
8:30 AM	38	20	14	0	50	68	30	0	28	464	26	0	21	286	14	0	1059
8:45 AM	40	33	33	0	43	51	17	0	25	418	18	1	21	284	17	0	1001
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	298	306	135	0	288	567	232	2	262	3350	189	3	165	2606	129	0	8532
APPROACH %'s :	40.32%	41.41%	18.27%	0.00%	26.45%	52.07%	21.30%	0.18%	6.89%	88.07%	4.97%	0.08%	5.69%	89.86%	4.45%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	136	192	66	0	136	305	135	2	137	1707	92	1	85	1461	78	0	4533
PEAK HR FACTOR :	0.791	0.774	0.786	0.000	0.723	0.887	0.912	0.500	0.901	0.920	0.793	0.250	0.708	0.941	0.886	0.000	0.952
	0.887				0.932				0.912				0.962				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	2	0	0	2	1	1	0	1	3	0	0	1	4	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	36	48	23	0	60	60	44	1	47	389	32	1	33	392	29	0	1195
4:15 PM	50	57	24	0	49	76	58	1	49	415	35	0	32	378	39	0	1263
4:30 PM	48	56	16	0	55	67	37	0	45	406	22	0	29	412	46	1	1240
4:45 PM	52	41	17	0	75	97	69	0	55	410	31	0	37	362	55	0	1301
5:00 PM	52	56	21	1	73	87	52	0	56	383	29	1	38	346	36	0	1231
5:15 PM	55	67	20	0	60	63	48	0	65	431	34	0	45	422	33	0	1343
5:30 PM	39	76	20	0	62	76	37	0	56	424	34	0	42	420	34	0	1320
5:45 PM	50	48	21	1	63	62	42	0	62	433	41	1	32	383	41	0	1280
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	382	449	162	2	497	588	387	2	435	3291	258	3	288	3115	313	1	10173
APPROACH %'s :	38.39%	45.13%	16.28%	0.20%	33.72%	39.89%	26.26%	0.14%	10.91%	82.54%	6.47%	0.08%	7.75%	83.80%	8.42%	0.03%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	198	240	78	1	270	323	206	0	232	1648	128	1	162	1550	158	0	5195
PEAK HR FACTOR :	0.900	0.789	0.929	0.250	0.900	0.832	0.746	0.000	0.892	0.956	0.941	0.250	0.900	0.918	0.718	0.000	0.967
	0.910				0.829				0.948				0.935				

Prepared by National Data & Surveying Services

Associated Rd & Imperial Hwy

Peak Hour Turning Movement Count

ID: 18-01231-009
City: Brea

Day: Tuesday
Date: 11/13/2018

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	NONE
PM	04:45 PM - 05:45 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

SOUTHBOUND — Associated Rd

AM	135	305	136	2	409	AM
NOON	0	0	0	0	0	NOON
PM	206	323	270	0	630	PM

EASTBOUND — Imperial Hwy

AM	NOON	PM	
1733	0	1955	
1	0	1	0
137	0	232	1
1707	0	1648	3
92	0	128	0

WESTBOUND — Imperial Hwy

PM	NOON	AM	
158	0	78	0
1550	0	1461	4
162	0	85	1
0	0	0	0
1996	0	1909	

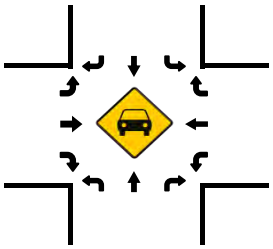
NORTHBOUND — Associated Rd

PM	614	1	198	240	78	PM
NOON	0	0	0	0	0	NOON
AM	482	0	136	192	66	AM

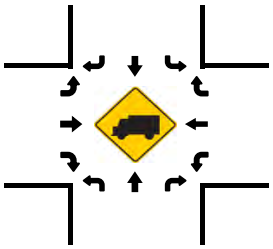
CONTROL: Signalized

TEV	4533	0	5195
	AM	NOON	PM
PHF	0.95		0.97

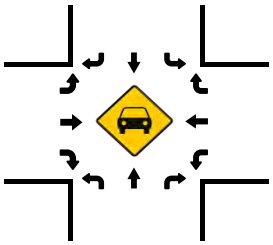
Total Vehicles (AM)



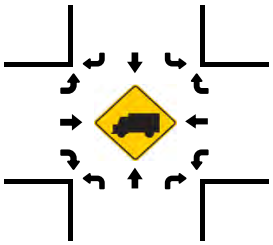
2axle (AM)



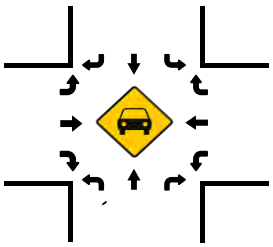
Total Vehicles (Noon)



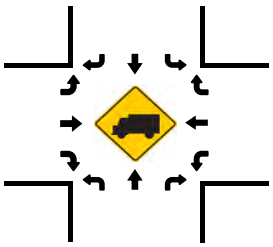
2axle (NOON)



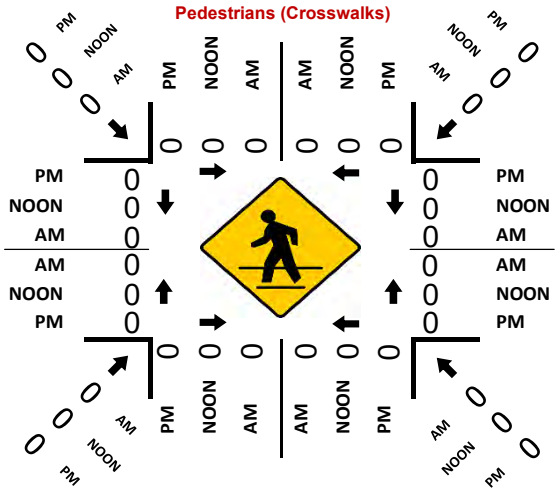
Total Vehicles (PM)



2axle (PM)



Pedestrians (Crosswalks)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Castlegate Ln/Placentia Ave & Imperial Hwy
City: Brea
Control: Signalized

Project ID: 18-01231-010
Date: 11/13/2018

Total

NS/EW Streets:	Castlegate Ln/Placentia Ave				Castlegate Ln/Placentia Ave				Imperial Hwy				Imperial Hwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1.5	0.5	1	0	1	1	0	0	1	3	1	0	1	3	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	27	1	19	0	6	1	0	0	0	363	55	0	21	289	5	0	787
7:15 AM	30	5	27	0	8	6	4	0	0	356	50	0	30	292	5	0	813
7:30 AM	49	5	40	0	4	2	5	0	1	362	85	0	34	312	1	0	900
7:45 AM	54	5	32	0	6	12	5	0	4	429	78	1	42	377	9	0	1054
8:00 AM	25	3	24	0	5	6	2	0	2	415	83	0	46	346	7	0	964
8:15 AM	42	1	30	0	4	5	3	0	2	392	77	0	26	338	9	0	929
8:30 AM	37	2	48	0	8	3	3	0	3	435	91	0	48	276	5	0	959
8:45 AM	34	1	32	0	8	5	3	0	2	424	72	0	32	292	7	1	913
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	298	23	252	0	49	40	25	0	14	3176	591	1	279	2522	48	1	7319
APPROACH %'s :	52.01%	4.01%	43.98%	0.00%	42.98%	35.09%	21.93%	0.00%	0.37%	83.98%	15.63%	0.03%	9.79%	88.49%	1.68%	0.04%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	158	11	134	0	23	26	13	0	11	1671	329	1	162	1337	30	0	3906
PEAK HR FACTOR :	0.731	0.550	0.698	0.000	0.719	0.542	0.650	0.000	0.688	0.960	0.904	0.250	0.844	0.887	0.833	0.000	0.926
	0.832				0.674				0.951				0.893				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1.5	0.5	1	0	1	1	0	0	1	3	1	0	1	3	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	41	6	35	0	8	6	2	0	3	409	61	1	40	425	12	2	1051
4:15 PM	50	8	54	0	6	3	5	0	3	421	47	0	40	433	7	1	1078
4:30 PM	66	9	56	0	2	3	2	0	5	411	54	0	48	447	7	0	1110
4:45 PM	47	4	55	0	8	12	2	0	7	425	59	0	48	405	9	0	1081
5:00 PM	49	11	63	0	7	3	5	0	3	398	65	0	56	417	14	4	1095
5:15 PM	56	20	72	0	6	3	4	0	2	429	77	0	53	444	22	4	1192
5:30 PM	41	7	54	0	5	2	2	0	4	421	77	0	38	414	15	1	1081
5:45 PM	44	10	41	0	7	4	2	0	0	445	56	2	48	404	13	1	1077
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	394	75	430	0	49	36	24	0	27	3359	496	3	371	3389	99	13	8765
APPROACH %'s :	43.83%	8.34%	47.83%	0.00%	44.95%	33.03%	22.02%	0.00%	0.69%	86.46%	12.77%	0.08%	9.58%	87.53%	2.56%	0.34%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	218	44	246	0	23	21	13	0	17	1663	255	0	205	1713	52	8	4478
PEAK HR FACTOR :	0.826	0.550	0.854	0.000	0.719	0.438	0.650	0.000	0.607	0.969	0.828	0.000	0.915	0.958	0.591	0.500	0.939
	0.858				0.648				0.952				0.946				

Prepared by National Data & Surveying Services

Castlegate Ln/Placentia Ave & Imperial Hwy

Peak Hour Turning Movement Count

ID: 18-01231-010
City: Brea

Day: Tuesday
Date: 11/13/2018

PEAK HOURS

AM: 07:45 AM - 08:45 AM
NOON: NONE
PM: 04:30 PM - 05:30 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

Castlegate Ln/Placentia Ave — SOUTHBOUND

AM	13	26	23	0	52	AM
NOON	0	0	0	0	0	NOON
PM	13	21	23	0	113	PM

Imperial Hwy — EASTBOUND

AM	NOON	PM		
1509	0	1944	⇦	
1	0	0	↶	0
11	0	17	↱	1
1671	0	1663	→	3
329	0	255	↳	1
AM	NOON	PM		

Imperial Hwy — WESTBOUND

PM	NOON	AM		
52	0	30	↰	0
1713	0	1337	←	3
205	0	162	↰	1
8	0	0	↶	0
1940	0	1828	⇨	
PM	NOON	AM		

CONTROL: Signalized

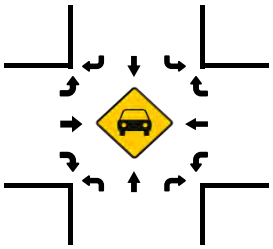
TEV	3906	0	4478
	AM	NOON	PM
PHF	0.93		0.94

Castlegate Ln/Placentia Ave — NORTHBOUND

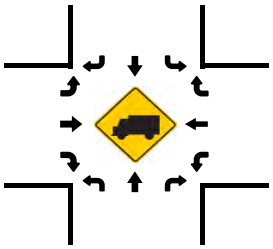
PM	481	0	218	44	246	PM
NOON	0	0	0	0	0	NOON
AM	517	0	158	11	134	AM
		0	1.5	0.5	1	

	0	1	1	0

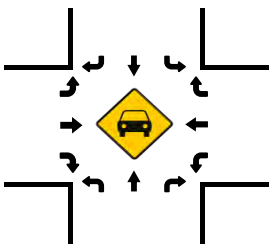
Total Vehicles (AM)



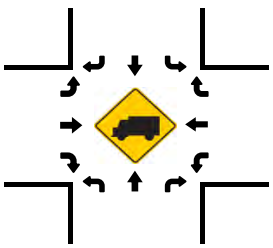
2axle (AM)



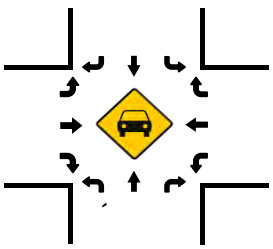
Total Vehicles (Noon)



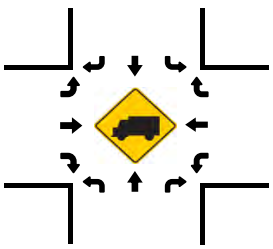
2axle (NOON)



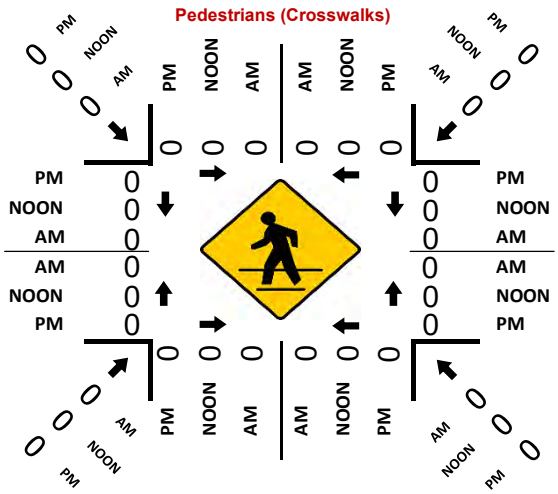
Total Vehicles (PM)



2axle (PM)



Pedestrians (Crosswalks)



Prepared by NDS/ATD

VOLUME

Imperial Hwy E/O SR-57 NB Ramps

Day: Tuesday
Date: 11/13/2018

City: Brea
Project #: CA18_1233_013

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	26,754	26,304	53,058

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			44		32		76		12:00			363		466		829	
0:15			36		32		68		12:15			394		437		831	
0:30			34		23		57		12:30			365		461		826	
0:45			16	130	11	98	27	228	12:45			394	1516	454	1818	848	3334
1:00			22		27		49		13:00			390		438		828	
1:15			17		9		26		13:15			428		431		859	
1:30			19		29		48		13:30			409		449		858	
1:45			19	77	18	83	37	160	13:45			429	1656	404	1722	833	3378
2:00			14		17		31		14:00			412		426		838	
2:15			14		16		30		14:15			378		441		819	
2:30			18		12		30		14:30			393		456		849	
2:45			26	72	14	59	40	131	14:45			396	1579	414	1737	810	3316
3:00			14		21		35		15:00			398		484		882	
3:15			10		21		31		15:15			465		450		915	
3:30			25		43		68		15:30			491		480		971	
3:45			35	84	38	123	73	207	15:45			473	1827	517	1931	990	3758
4:00			32		47		79		16:00			469		473		942	
4:15			38		50		88		16:15			499		486		985	
4:30			107		89		196		16:30			473		497		970	
4:45			153	330	87	273	240	603	16:45			496	1937	483	1939	979	3876
5:00			88		98		186		17:00			469		451		920	
5:15			133		117		250		17:15			530		525		1055	
5:30			177		188		365		17:30			514		496		1010	
5:45			235	633	179	582	414	1215	17:45			537	2050	476	1948	1013	3998
6:00			249		228		477		18:00			464		436		900	
6:15			260		233		493		18:15			477		418		895	
6:30			404		255		659		18:30			418		378		796	
6:45			417	1330	310	1026	727	2356	18:45			389	1748	347	1579	736	3327
7:00			441		336		777		19:00			380		340		720	
7:15			446		374		820		19:15			358		346		704	
7:30			446		418		864		19:30			292		310		602	
7:45			531	1864	447	1575	978	3439	19:45			268	1298	276	1272	544	2570
8:00			477		455		932		20:00			253		301		554	
8:15			483		413		896		20:15			254		247		501	
8:30			518		354		872		20:30			242		245		487	
8:45			462	1940	342	1564	804	3504	20:45			205	954	247	1040	452	1994
9:00			413		297		710		21:00			180		230		410	
9:15			359		295		654		21:15			176		222		398	
9:30			369		290		659		21:30			141		164		305	
9:45			374	1515	376	1258	750	2773	21:45			137	634	163	779	300	1413
10:00			362		349		711		22:00			142		145		287	
10:15			412		339		751		22:15			127		98		225	
10:30			352		408		760		22:30			106		94		200	
10:45			355	1481	416	1512	771	2993	22:45			78	453	96	433	174	886
11:00			366		389		755		23:00			52		61		113	
11:15			363		441		804		23:15			57		61		118	
11:30			349		453		802		23:30			41		57		98	
11:45			382	1460	455	1738	837	3198	23:45			36	186	36	215	72	401
TOTALS				10916		9891		**20807**	**TOTALS**				15838		16413		**32251**
SPLIT %				52.5%		47.5%		**39.2%**	**SPLIT %**				49.1%		50.9%		**60.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	26,754	26,304	53,058

AM Peak Hour			7:45	11:45	**7:45**	**PM Peak Hour**			17:00	15:45	**17:00**
AM Pk Volume			2009	1819	**3678**	**PM Pk Volume**			2050	1973	**3998**
Pk Hr Factor			0.946	0.976	**0.940**	**Pk Hr Factor**			0.954	0.954	**0.947**
7 - 9 Volume	0	0	3804	3139	**6943**	**4 - 6 Volume**	0	0	3987	3887	**7874**
7 - 9 Peak Hour			7:45	7:30	**7:45**	**4 - 6 Peak Hour**			17:00	16:30	**17:00**
7 - 9 Pk Volume	0	0	2009	1733	**3678**	**4 - 6 Pk Volume**	0	0	2050	1956	**3998**
Pk Hr Factor	0.000	0.000	0.946	0.952	**0.940**	**Pk Hr Factor**	0.000	0.000	0.954	0.931	**0.947**

Prepared by NDS/ATD

VOLUME

Imperial Hwy E/O Associated Rd

Day: Tuesday
Date: 11/13/2018

City: Brea
Project #: CA18_1233_014

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	26,549	24,435	50,984

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			31		23		54		12:00			390		434		824	
0:15			26		22		48		12:15			434		435		869	
0:30			28		19		47		12:30			414		427		841	
0:45			13	98	11	75	24	173	12:45			464	1702	436	1732	900	3434
1:00			18		22		40		13:00			428		413		841	
1:15			13		6		19		13:15			452		417		869	
1:30			17		20		37		13:30			417		445		862	
1:45			16	64	12	60	28	124	13:45			468	1765	388	1663	856	3428
2:00			14		15		29		14:00			431		400		831	
2:15			11		13		24		14:15			395		424		819	
2:30			16		10		26		14:30			408		438		846	
2:45			22	63	10	48	32	111	14:45			394	1628	384	1646	778	3274
3:00			11		12		23		15:00			412		451		863	
3:15			7		17		24		15:15			478		425		903	
3:30			23		28		51		15:30			480		472		952	
3:45			35	76	28	85	63	161	15:45			479	1849	472	1820	951	3669
4:00			31		38		69		16:00			472		454		926	
4:15			31		39		70		16:15			488		449		937	
4:30			89		68		157		16:30			478		488		966	
4:45			141	292	64	209	205	501	16:45			502	1940	454	1845	956	3785
5:00			87		65		152		17:00			477		420		897	
5:15			128		86		214		17:15			511		500		1011	
5:30			164		143		307		17:30			506		496		1002	
5:45			217	596	148	442	365	1038	17:45			517	2011	456	1872	973	3883
6:00			238		187		425		18:00			462		425		887	
6:15			245		183		428		18:15			468		422		890	
6:30			372		235		607		18:30			410		366		776	
6:45			402	1257	271	876	673	2133	18:45			352	1692	333	1546	685	3238
7:00			422		303		725		19:00			357		325		682	
7:15			420		330		750		19:15			342		332		674	
7:30			423		384		807		19:30			285		291		576	
7:45			514	1779	422	1439	936	3218	19:45			267	1251	250	1198	517	2449
8:00			484		422		906		20:00			238		293		531	
8:15			488		396		884		20:15			236		216		452	
8:30			528		321		849		20:30			238		216		454	
8:45			494	1994	322	1461	816	3455	20:45			183	895	219	944	402	1839
9:00			425		275		700		21:00			146		209		355	
9:15			351		294		645		21:15			161		191		352	
9:30			356		267		623		21:30			125		139		264	
9:45			346	1478	365	1201	711	2679	21:45			112	544	139	678	251	1222
10:00			367		351		718		22:00			133		116		249	
10:15			412		320		732		22:15			105		83		188	
10:30			373		375		748		22:30			80		82		162	
10:45			360	1512	418	1464	778	2976	22:45			64	382	78	359	142	741
11:00			387		360		747		23:00			36		48		84	
11:15			368		418		786		23:15			50		38		88	
11:30			365		423		788		23:30			32		35		67	
11:45			409	1529	428	1629	837	3158	23:45			34	152	22	143	56	295
TOTALS				10738		8989		**19727**	**TOTALS**				15811		15446		**31257**
SPLIT %				54.4%		45.6%		**38.7%**	**SPLIT %**				50.6%		49.4%		**61.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	26,549	24,435	50,984

AM Peak Hour			7:45	11:45	**7:45**	**PM Peak Hour**			17:00	17:15	**17:00**
AM Pk Volume			2014	1724	**3575**	**PM Pk Volume**			2011	1877	**3883**
Pk Hr Factor			0.954	0.991	**0.955**	**Pk Hr Factor**			0.972	0.939	**0.960**
7 - 9 Volume	0	0	3773	2900	**6673**	**4 - 6 Volume**	0	0	3951	3717	**7668**
7 - 9 Peak Hour			7:45	7:30	**7:45**	**4 - 6 Peak Hour**			17:00	17:00	**17:00**
7 - 9 Pk Volume	0	0	2014	1624	**3575**	**4 - 6 Pk Volume**	0	0	2011	1872	**3883**
Pk Hr Factor	0.000	0.000	0.954	0.962	**0.955**	**Pk Hr Factor**	0.000	0.000	0.972	0.936	**0.960**

Prepared by NDS/ATD

VOLUME

Imperial Hwy E/O Castlegate Ln/Placentia Ave

Day: Tuesday
Date: 11/13/2018

City: Brea
Project #: CA18_1233_015

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	26,188	24,966	51,154

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00					27		20		47		12:00					398		437		835	
0:15					18		18		36		12:15					448		429		877	
0:30					24		15		39		12:30					419		457		876	
0:45					11	80	8	61	19	141	12:45					495	1760	415	1738	910	3498
1:00					11		19		30		13:00					450		421		871	
1:15					16		3		19		13:15					464		428		892	
1:30					13		18		31		13:30					434		464		898	
1:45					17	57	13	53	30	110	13:45					456	1804	412	1725	868	3529
2:00					15		14		29		14:00					444		439		883	
2:15					10		6		16		14:15					415		430		845	
2:30					15		7		22		14:30					426		456		882	
2:45					20	60	9	36	29	96	14:45					419	1704	399	1724	818	3428
3:00					10		12		22		15:00					447		434		881	
3:15					7		14		21		15:15					485		448		933	
3:30					21		30		51		15:30					491		478		969	
3:45					31	69	25	81	56	150	15:45					500	1923	468	1828	968	3751
4:00					33		36		69		16:00					454		479		933	
4:15					31		40		71		16:15					482		481		963	
4:30					80		63		143		16:30					469		502		971	
4:45					129	273	57	196	186	469	16:45					488	1893	462	1924	950	3817
5:00					78		62		140		17:00					472		491		963	
5:15					114		72		186		17:15					511		523		1034	
5:30					175		136		311		17:30					481		468		949	
5:45					248	615	131	401	379	1016	17:45					494	1958	466	1948	960	3906
6:00					231		191		422		18:00					431		445		876	
6:15					227		164		391		18:15					438		452		890	
6:30					331		236		567		18:30					450		422		872	
6:45					403	1192	295	886	698	2078	18:45					334	1653	331	1650	665	3303
7:00					388		315		703		19:00					342		341		683	
7:15					391		327		718		19:15					324		338		662	
7:30					406		347		753		19:30					266		304		570	
7:45					467	1652	428	1417	895	3069	19:45					258	1190	260	1243	518	2433
8:00					444		399		843		20:00					236		307		543	
8:15					426		373		799		20:15					213		251		464	
8:30					491		329		820		20:30					213		221		434	
8:45					465	1826	332	1433	797	3259	20:45					162	824	227	1006	389	1830
9:00					411		325		736		21:00					121		228		349	
9:15					364		312		676		21:15					143		197		340	
9:30					393		271		664		21:30					107		151		258	
9:45					376	1544	368	1276	744	2820	21:45					106	477	141	717	247	1194
10:00					381		355		736		22:00					103		106		209	
10:15					418		315		733		22:15					85		91		176	
10:30					380		381		761		22:30					68		80		148	
10:45					376	1555	413	1464	789	3019	22:45					49	305	73	350	122	655
11:00					384		378		762		23:00					35		52		87	
11:15					411		411		822		23:15					48		40		88	
11:30					393		432		825		23:30					32		34		66	
11:45					440	1628	439	1660	879	3288	23:45					31	146	23	149	54	295
TOTALS						10551		8964		19515	TOTALS						15637		16002		31639
SPLIT %						54.1%		45.9%		38.1%	SPLIT %						49.4%		50.6%		61.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	26,188	24,966	51,154

AM Peak Hour			7:45	11:45	11:45	PM Peak Hour			17:00	16:30	16:30
AM Pk Volume			1828	1762	3467	PM Pk Volume			1958	1978	3918
Pk Hr Factor			0.931	0.964	0.986	Pk Hr Factor			0.958	0.946	0.947
7 - 9 Volume	0	0	3478	2850	6328	4 - 6 Volume	0	0	3851	3872	7723
7 - 9 Peak Hour			7:45	7:30	7:45	4 - 6 Peak Hour			17:00	16:30	16:30
7 - 9 Pk Volume	0	0	1828	1547	3357	4 - 6 Pk Volume	0	0	1958	1978	3918
Pk Hr Factor	0.000	0.000	0.931	0.904	0.938	Pk Hr Factor	0.000	0.000	0.958	0.946	0.947

Prepared by NDS/ATD

VOLUME

Birch St E/O S Associated Rd

Day: Tuesday
Date: 11/13/2018

City: Brea
Project #: CA18_1232_008

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	12,383	11,595	23,978

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			13		6		19		12:00			201		199		400	
00:15			10		10		20		12:15			187		185		372	
00:30			6		1		7		12:30			175		147		322	
00:45			3	32	3	20	6	52	12:45			215	778	177	708	392	1486
01:00			6		4		10		13:00			163		161		324	
01:15			4		3		7		13:15			215		145		360	
01:30			2		4		6		13:30			205		180		385	
01:45			5	17	2	13	7	30	13:45			242	825	160	646	402	1471
02:00			0		2		2		14:00			248		153		401	
02:15			3		2		5		14:15			239		166		405	
02:30			2		1		3		14:30			278		206		484	
02:45			6	11	1	6	7	17	14:45			256	1021	307	832	563	1853
03:00			6		4		10		15:00			310		233		543	
03:15			1		9		10		15:15			280		185		465	
03:30			4		15		19		15:30			242		266		508	
03:45			5	16	10	38	15	54	15:45			237	1069	248	932	485	2001
04:00			2		7		9		16:00			218		268		486	
04:15			16		13		29		16:15			254		264		518	
04:30			32		18		50		16:30			265		320		585	
04:45			31	81	24	62	55	143	16:45			265	1002	324	1176	589	2178
05:00			18		20		38		17:00			269		365		634	
05:15			29		26		55		17:15			294		368		662	
05:30			31		47		78		17:30			284		344		628	
05:45			92	170	64	157	156	327	17:45			263	1110	278	1355	541	2465
06:00			75		49		124		18:00			235		224		459	
06:15			97		97		194		18:15			242		193		435	
06:30			214		108		322		18:30			186		193		379	
06:45			256	642	147	401	403	1043	18:45			208	871	141	751	349	1622
07:00			202		164		366		19:00			173		112		285	
07:15			215		165		380		19:15			137		123		260	
07:30			282		223		505		19:30			123		96		219	
07:45			335	1034	296	848	631	1882	19:45			96	529	87	418	183	947
08:00			292		271		563		20:00			114		81		195	
08:15			275		246		521		20:15			109		77		186	
08:30			148		188		336		20:30			112		57		169	
08:45			147	862	182	887	329	1749	20:45			93	428	65	280	158	708
09:00			133		157		290		21:00			75		50		125	
09:15			101		126		227		21:15			68		22		90	
09:30			107		134		241		21:30			48		31		79	
09:45			110	451	158	575	268	1026	21:45			54	245	27	130	81	375
10:00			97		145		242		22:00			45		23		68	
10:15			111		122		233		22:15			38		32		70	
10:30			124		148		272		22:30			35		22		57	
10:45			126	458	142	557	268	1015	22:45			17	135	15	92	32	227
11:00			133		135		268		23:00			27		15		42	
11:15			125		159		284		23:15			14		14		28	
11:30			123		189		312		23:30			13		15		28	
11:45			154	535	175	658	329	1193	23:45			7	61	9	53	16	114
TOTALS				4309		4222		8531	TOTALS				8074		7373		15447
SPLIT %				50.5%		49.5%		35.6%	SPLIT %				52.3%		47.7%		64.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	12,383	11,595	23,978

AM Peak Hour			07:30	07:30	07:30	PM Peak Hour			14:30	16:45	16:45
AM Pk Volume			1184	1036	2220	PM Pk Volume			1124	1401	2513
Pk Hr Factor			0.884	0.875	0.880	Pk Hr Factor			0.906	0.952	0.949
7 - 9 Volume	0	0	1896	1735	3631	4 - 6 Volume	0	0	2112	2531	4643
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			16:45	16:45	16:45
7 - 9 Pk Volume	0	0	1184	1036	2220	4 - 6 Pk Volume	0	0	1112	1401	2513
Pk Hr Factor	0.000	0.000	0.884	0.875	0.880	Pk Hr Factor	0.000	0.000	0.946	0.952	0.949

APPENDIX B-III

YEAR 2020 COVID-19 COUNTS

National Data & Surveying Services

Intersection Turning Movement Count

Location: S Associated Rd & Greenbriar Ln
City: Brea
Control: Signalized

Project ID: 20-010024-001
Date: 10/29/2020

Total

NS/EW Streets:	S Associated Rd				S Associated Rd				Greenbriar Ln				Greenbriar Ln				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	55	1	0	1	45	0	0	0	0	9	0	3	2	3	0	120
7:15 AM	0	55	1	0	0	66	0	0	1	0	2	0	11	2	2	0	140
7:30 AM	4	56	3	0	0	70	1	0	0	1	3	0	7	0	4	0	149
7:45 AM	4	84	2	1	4	82	1	0	1	1	7	0	6	3	7	0	203
8:00 AM	3	70	3	0	1	75	1	0	1	0	5	0	10	3	12	0	184
8:15 AM	5	60	1	0	3	83	1	0	1	0	4	0	2	0	6	0	166
8:30 AM	8	52	4	0	4	72	1	0	0	0	4	0	10	0	2	0	157
8:45 AM	4	53	5	0	6	54	0	0	1	0	4	0	8	1	4	0	140
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	29	485	20	1	19	547	5	0	5	2	38	0	57	11	40	0	1259
APPROACH %'s :	5.42%	90.65%	3.74%	0.19%	3.33%	95.80%	0.88%	0.00%	11.11%	4.44%	84.44%	0.00%	52.78%	10.19%	37.04%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	20	266	10	1	12	312	4	0	3	1	20	0	28	6	27	0	710
PEAK HR FACTOR :	0.625	0.792	0.625	0.250	0.750	0.940	1.000	0.000	0.750	0.250	0.714	0.000	0.700	0.500	0.563	0.000	0.874
	0.816				0.943				0.667				0.610				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	8	93	10	2	3	113	2	1	3	0	5	0	4	1	5	0	250
4:15 PM	8	105	6	0	5	110	1	0	7	1	3	0	4	0	5	0	255
4:30 PM	5	108	8	0	2	89	3	1	2	1	5	0	3	2	10	0	239
4:45 PM	8	107	6	1	2	110	2	0	4	1	7	0	3	1	6	0	258
5:00 PM	9	101	9	0	5	112	1	0	3	2	6	0	5	2	7	0	262
5:15 PM	10	120	7	0	3	128	2	0	4	1	6	0	7	0	10	0	298
5:30 PM	4	118	9	1	4	115	1	0	1	4	4	0	6	1	7	0	275
5:45 PM	7	110	8	0	5	93	1	0	2	5	4	0	8	4	7	0	254
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	59	862	63	4	29	870	13	2	26	15	40	0	40	11	57	0	2091
APPROACH %'s :	5.97%	87.25%	6.38%	0.40%	3.17%	95.19%	1.42%	0.22%	32.10%	18.52%	49.38%	0.00%	37.04%	10.19%	52.78%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	31	446	31	2	14	465	6	0	12	8	23	0	21	4	30	0	1093
PEAK HR FACTOR :	0.775	0.929	0.861	0.500	0.700	0.908	0.750	0.000	0.750	0.500	0.821	0.000	0.750	0.500	0.750	0.000	0.917
	0.931				0.912				0.896				0.809				

Prepared by National Data & Surveying Services

S Associated Rd & Greenbriar Ln

Peak Hour Turning Movement Count

ID: 20-010024-001
City: Brea

Day: Thursday
Date: 10/29/2020

PEAK HOURS

AM: 07:45 AM - 08:45 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

S Associated Rd — SOUTHBOUND

AM	4	312	12	0	296	AM
NOON	0	0	0	0	0	NOON
PM	6	465	14	0	488	PM

EASTBOUND — Greenbriar Ln

AM	NOON	PM	
30	0	41	
0	0	0	0
3	0	12	0
1	0	8	1
20	0	23	0
AM	NOON	PM	

WESTBOUND — Greenbriar Ln

PM	NOON	AM	
30	0	27	0
4	0	6	1
21	0	28	0
0	0	0	0
53	0	23	
PM	NOON	AM	

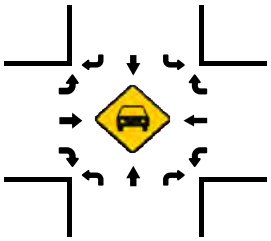
NORTHBOUND — S Associated Rd

PM	511	2	31	446	31	PM
NOON	0	0	0	0	0	NOON
AM	361	1	20	266	10	AM

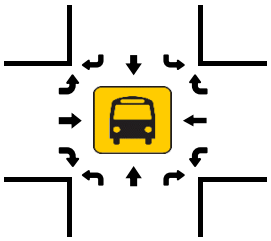
CONTROL: Signalized

TEV	710 AM	0 NOON	1093 PM
PHF	0.87		0.92

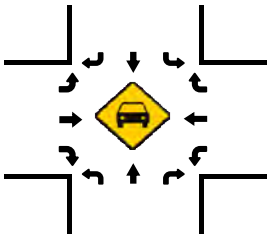
Total Vehicles (AM)



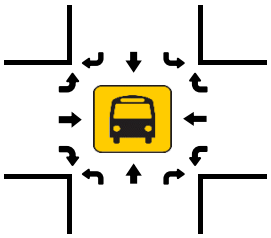
Total Vehicles (AM)



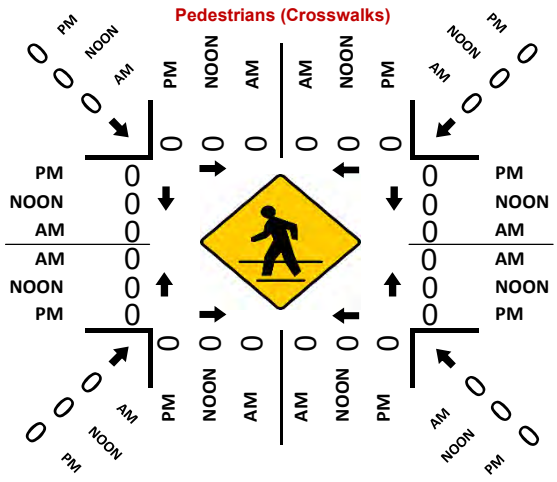
Total Vehicles (NOON)



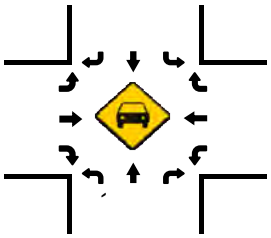
Total Vehicles (NOON)



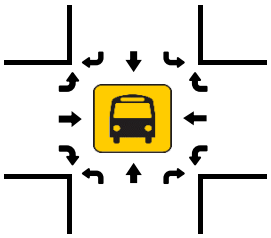
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: S Associated Rd & Imperial Hwy
City: Brea
Control: Signalized

Project ID: 20-010024-002
Date: 10/29/2020

Total

NS/EW Streets:	S Associated Rd				S Associated Rd				Imperial Hwy				Imperial Hwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	2	0	0	2	1	1	0	1	3	0	0	1	4	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	27	11	4	0	5	28	23	0	32	267	7	1	5	192	9	0	611
7:15 AM	30	22	10	0	24	33	27	0	38	289	10	0	11	245	8	0	747
7:30 AM	49	36	24	0	16	41	40	0	43	345	18	0	19	237	12	0	880
7:45 AM	23	29	11	0	16	28	27	0	36	385	16	0	12	244	12	0	839
8:00 AM	22	15	9	0	24	41	30	1	22	323	12	0	14	249	17	0	779
8:15 AM	24	14	15	0	21	29	26	1	26	346	11	0	8	233	26	0	780
8:30 AM	27	23	11	0	25	29	21	0	27	319	11	0	14	245	13	0	765
8:45 AM	24	13	10	0	16	31	33	0	26	351	15	0	10	216	14	0	759
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	226	163	94	0	147	260	227	2	250	2625	100	1	93	1861	111	0	6160
APPROACH %'s :	46.79%	33.75%	19.46%	0.00%	23.11%	40.88%	35.69%	0.31%	8.40%	88.21%	3.36%	0.03%	4.50%	90.12%	5.38%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	118	94	59	0	77	139	123	2	127	1399	57	0	53	963	67	0	3278
PEAK HR FACTOR :	0.602	0.653	0.615	0.000	0.802	0.848	0.769	0.500	0.738	0.908	0.792	0.000	0.697	0.967	0.644	0.000	0.931
	0.622				0.879				0.906				0.967				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	2	0	0	2	1	1	0	1	3	0	0	1	4	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	42	27	16	1	64	54	56	0	54	376	23	2	29	379	33	0	1156
4:15 PM	34	36	13	1	49	42	42	1	41	360	29	1	21	397	43	0	1110
4:30 PM	44	29	22	0	53	43	49	0	39	379	27	3	22	396	43	0	1149
4:45 PM	45	32	13	0	49	36	44	0	59	381	36	0	34	362	40	0	1131
5:00 PM	32	42	17	0	45	62	65	0	46	394	33	2	26	404	43	0	1211
5:15 PM	38	41	22	0	58	33	42	1	55	401	38	0	34	340	32	0	1135
5:30 PM	38	43	23	0	53	38	51	0	55	405	42	2	29	341	40	0	1160
5:45 PM	42	30	21	0	55	42	48	0	55	363	25	0	33	377	31	0	1122
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	315	280	147	2	426	350	397	2	404	3059	253	10	228	2996	305	0	9174
APPROACH %'s :	42.34%	37.63%	19.76%	0.27%	36.26%	29.79%	33.79%	0.17%	10.84%	82.10%	6.79%	0.27%	6.46%	84.90%	8.64%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	153	158	75	0	205	169	202	1	215	1581	149	4	123	1447	155	0	4637
PEAK HR FACTOR :	0.850	0.919	0.815	0.000	0.884	0.681	0.777	0.250	0.911	0.976	0.887	0.500	0.904	0.895	0.901	0.000	0.957
	0.928				0.839				0.967				0.912				

Prepared by National Data & Surveying Services

S Associated Rd & Imperial Hwy

Peak Hour Turning Movement Count

ID: 20-010024-002
City: Brea

Day: Thursday
Date: 10/29/2020

PEAK HOURS

AM: 07:30 AM - 08:30 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

S Associated Rd — SOUTHBOUND

AM	123	139	77	2	290	AM
NOON	0	0	0	0	0	NOON
PM	202	169	205	1	529	PM
	1	1	2	0		

Imperial Hwy — EASTBOUND

AM	NOON	PM	
1204	0	1806	
0	0	4	0
127	0	215	1
1399	0	1581	3
57	0	149	0
AM	NOON	PM	

CONTROL

Signalized

	AM	NOON	PM
TEV	3278	0	4637
PHF	0.93		0.96

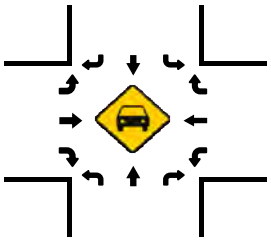
Imperial Hwy — WESTBOUND

PM	NOON	AM	
155	0	67	0
1447	0	963	4
123	0	53	1
0	0	0	0
1861	0	1535	
PM	NOON	AM	

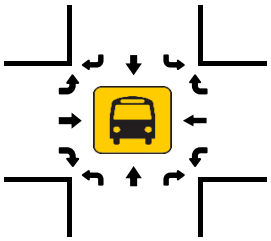
S Associated Rd — NORTHBOUND

PM	441	0	153	158	75	PM
NOON	0	0	0	0	0	NOON
AM	249	0	118	94	59	AM
		0	2	2	0	

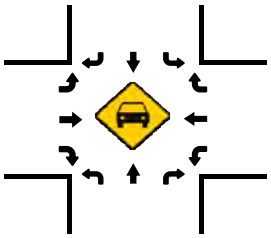
Total Vehicles (AM)



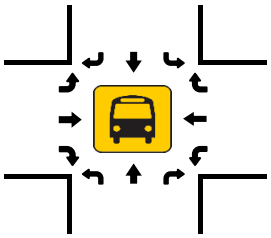
Total Vehicles (AM)



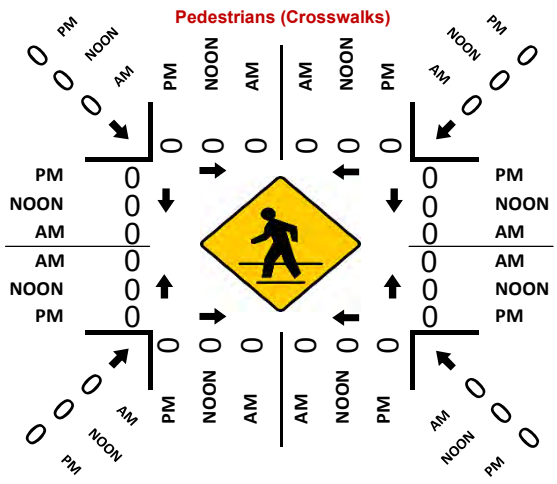
Total Vehicles (NOON)



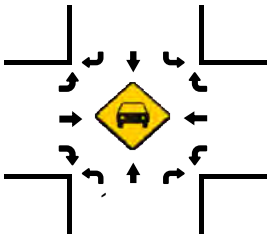
Total Vehicles (NOON)



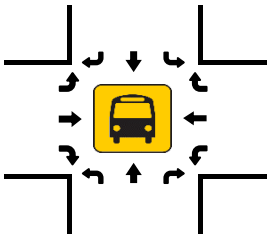
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Castlegate Ln/Placentia Ave & Imperial Hwy/CA 90
City: Brea
Control: Signalized

Project ID: 20-010024-003
Date: 10/29/2020

Total

NS/EW Streets:	Castlegate Ln/Placentia Ave				Castlegate Ln/Placentia Ave				Imperial Hwy/CA 90				Imperial Hwy/CA 90				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1.5	0.5	1	0	1	1	0	0	1	3	1	0	1	3	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	9	2	10	0	2	2	4	0	0	255	17	0	2	169	1	0	473
7:15 AM	23	3	19	0	1	2	3	0	3	267	16	0	9	220	0	0	566
7:30 AM	18	0	30	0	4	3	1	0	1	322	22	0	10	251	1	0	663
7:45 AM	36	6	33	0	3	1	4	0	2	312	23	0	18	222	1	0	661
8:00 AM	16	7	35	0	3	2	4	0	1	361	37	0	24	258	1	0	749
8:15 AM	17	0	13	0	2	2	3	0	4	304	38	2	18	232	1	0	636
8:30 AM	21	2	26	0	3	3	6	0	3	335	30	2	18	234	4	0	687
8:45 AM	21	2	37	0	10	1	7	0	2	349	34	0	21	232	4	0	720
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	161	22	203	0	28	16	32	0	16	2505	217	4	120	1818	13	0	5155
APPROACH %'s :	41.71%	5.70%	52.59%	0.00%	36.84%	21.05%	42.11%	0.00%	0.58%	91.36%	7.91%	0.15%	6.15%	93.18%	0.67%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	75	11	111	0	18	8	20	0	10	1349	139	4	81	956	10	0	2792
PEAK HR FACTOR :	0.893	0.393	0.750	0.000	0.450	0.667	0.714	0.000	0.625	0.934	0.914	0.500	0.844	0.926	0.625	0.000	0.932
	0.821				0.639				0.941				0.925				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1.5	0.5	1	0	1	1	0	0	1	3	1	0	1	3	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	16	4	53	0	5	2	1	0	2	380	42	1	40	422	8	1	977
4:15 PM	28	6	38	0	7	4	1	0	0	400	44	0	35	403	5	2	973
4:30 PM	33	3	51	0	5	4	3	0	4	357	38	0	42	410	11	0	961
4:45 PM	46	15	60	0	5	1	5	0	2	413	49	1	31	411	11	2	1052
5:00 PM	37	5	43	0	6	6	2	0	4	375	50	1	36	404	7	1	977
5:15 PM	45	7	51	0	5	6	6	0	5	418	49	0	32	390	8	0	1022
5:30 PM	28	5	49	0	8	4	3	0	7	426	49	1	50	369	10	2	1011
5:45 PM	38	7	46	0	7	2	2	0	3	408	50	1	49	399	6	0	1018
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	271	52	391	0	48	29	23	0	27	3177	371	5	315	3208	66	8	7991
APPROACH %'s :	37.96%	7.28%	54.76%	0.00%	48.00%	29.00%	23.00%	0.00%	0.75%	88.74%	10.36%	0.14%	8.76%	89.19%	1.83%	0.22%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	156	32	203	0	24	17	16	0	18	1632	197	3	149	1574	36	5	4062
PEAK HR FACTOR :	0.848	0.533	0.846	0.000	0.750	0.708	0.667	0.000	0.643	0.958	0.985	0.750	0.745	0.957	0.818	0.625	0.965
	0.808				0.838				0.958				0.969				

Prepared by National Data & Surveying Services

Castlegate Ln/Placentia Ave & Imperial Hwy/CA 90

Peak Hour Turning Movement Count

ID: 20-010024-003
City: Brea

Day: Thursday
Date: 10/29/2020

PEAK HOURS	
AM	08:00 AM - 09:00 AM
NOON	NONE
PM	04:45 PM - 05:45 PM

COUNT PERIODS	
AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Castlegate Ln/Placentia Ave — SOUTHBOUND

AM	20	8	18	0	31	AM
NOON	0	0	0	0	0	NOON
PM	16	17	24	0	86	PM

EASTBOUND — Imperial Hwy/CA 90

AM	NOON	PM		
1055	0	1749	⇦	
4	0	3	↶	0
10	0	18	↱	1
1349	0	1632	→	3
139	0	197	↴	1
AM	NOON	PM		

WESTBOUND — Imperial Hwy/CA 90

PM	NOON	AM		
36	0	10	↰	0
1574	0	956	←	3
149	0	81	↰	1
5	0	0	↶	0
1864	0	1478	⇨	
PM	NOON	AM		

NORTHBOUND — Castlegate Ln/Placentia Ave

PM	363	0	156	32	203	PM
NOON	0	0	0	0	0	NOON
AM	228	0	75	11	111	AM

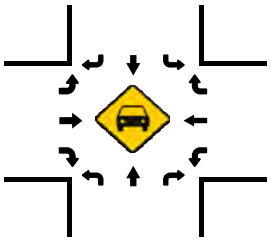
	0	1	1	0
	0	1.5	0.5	1

CONTROL

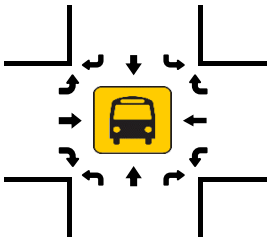
Signalized

TEV	2792	0	4062
	AM	NOON	PM
PHF	0.93		0.97

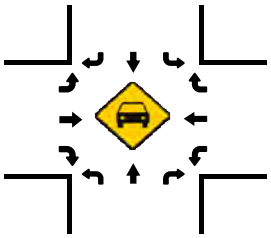
Total Vehicles (AM)



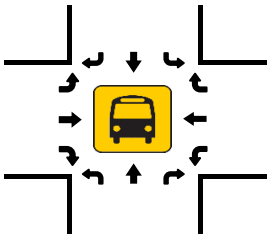
Total Vehicles (AM)



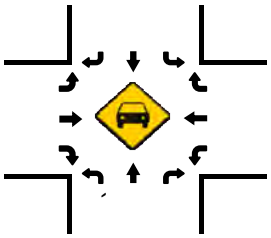
Total Vehicles (NOON)



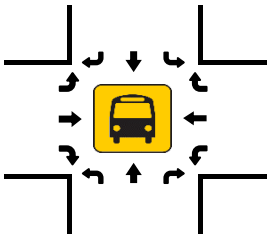
Total Vehicles (NOON)



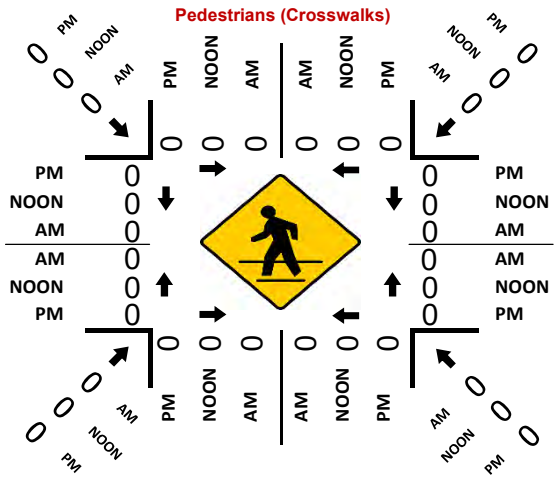
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

VOLUME

E Birch St E/O S Associated Rd

Day: Thursday
Date: 10/29/2020

City: Brea
Project #: CA20_010025_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	9,853	9,119	18,972

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			10		6		16		12:00			174		175		349	
00:15			12		3		15		12:15			178		177		355	
00:30			7		1		8		12:30			182		162		344	
00:45			5	34	3	13	8	47	12:45			154	688	201	715	355	1403
01:00			4		6		10		13:00			159		173		332	
01:15			4		1		5		13:15			187		167		354	
01:30			1		1		2		13:30			185		191		376	
01:45			6	15	7	15	13	30	13:45			170	701	159	690	329	1391
02:00			4		3		7		14:00			192		152		344	
02:15			1		2		3		14:15			165		190		355	
02:30			1		1		2		14:30			206		192		398	
02:45			0	6	1	7	1	13	14:45			209	772	155	689	364	1461
03:00			1		3		4		15:00			195		187		382	
03:15			3		1		4		15:15			221		196		417	
03:30			5		14		19		15:30			189		233		422	
03:45			11	20	11	29	22	49	15:45			196	801	218	834	414	1635
04:00			5		7		12		16:00			213		209		422	
04:15			11		8		19		16:15			222		224		446	
04:30			13		6		19		16:30			212		207		419	
04:45			25	54	12	33	37	87	16:45			251	898	217	857	468	1755
05:00			17		12		29		17:00			225		248		473	
05:15			15		15		30		17:15			275		242		517	
05:30			29		22		51		17:30			243		179		422	
05:45			47	108	41	90	88	198	17:45			211	954	211	880	422	1834
06:00			32		22		54		18:00			200		172		372	
06:15			64		41		105		18:15			184		179		363	
06:30			83		49		132		18:30			182		136		318	
06:45			136	315	71	183	207	498	18:45			163	729	126	613	289	1342
07:00			88		74		162		19:00			152		105		257	
07:15			123		105		228		19:15			131		92		223	
07:30			193		141		334		19:30			97		82		179	
07:45			230	634	239	559	469	1193	19:45			132	512	74	353	206	865
08:00			179		173		352		20:00			78		64		142	
08:15			160		162		322		20:15			88		60		148	
08:30			129		114		243		20:30			73		47		120	
08:45			128	596	154	603	282	1199	20:45			79	318	42	213	121	531
09:00			100		99		199		21:00			59		38		97	
09:15			110		114		224		21:15			60		36		96	
09:30			90		106		196		21:30			35		24		59	
09:45			107	407	127	446	234	853	21:45			39	193	32	130	71	323
10:00			89		88		177		22:00			31		14		45	
10:15			106		102		208		22:15			34		22		56	
10:30			110		132		242		22:30			22		14		36	
10:45			110	415	115	437	225	852	22:45			20	107	15	65	35	172
11:00			104		139		243		23:00			15		13		28	
11:15			125		145		270		23:15			19		21		40	
11:30			132		163		295		23:30			15		10		25	
11:45			155	516	161	608	316	1124	23:45			11	60	13	57	24	117
TOTALS				3120		3023		6143	TOTALS				6733		6096		12829
SPLIT %				50.8%		49.2%		32.4%	SPLIT %				52.5%		47.5%		67.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	9,853	9,119	18,972

AM Peak Hour			07:30	07:30	07:30	PM Peak Hour			16:45	16:30	16:45
AM Pk Volume			762	715	1477	PM Pk Volume			994	914	1880
Pk Hr Factor			0.828	0.748	0.787	Pk Hr Factor			0.904	0.921	0.909
7 - 9 Volume	0	0	1230	1162	2392	4 - 6 Volume	0	0	1852	1737	3589
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			16:45	16:30	16:45
7 - 9 Pk Volume	0	0	762	715	1477	4 - 6 Pk Volume	0	0	994	914	1880
Pk Hr Factor	0.000	0.000	0.828	0.748	0.787	Pk Hr Factor	0.000	0.000	0.904	0.921	0.909

Prepared by National Data & Surveying Services

VOLUME

S Associated Rd S/O E Birch St

Day: Thursday
Date: 10/29/2020

City: Brea
Project #: CA20_010025_002

DAILY TOTALS	NB	SB	EB	WB	Total
	5,312	5,130	0	0	10,442

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	8		4				12		12:00	113		95				208	
00:15	4		3				7		12:15	98		93				191	
00:30	3		2				5		12:30	107		106				213	
00:45	4	19	4	13			8	32	12:45	105	423	101	395			206	818
01:00	2		2				4		13:00	83		98				181	
01:15	3		0				3		13:15	112		108				220	
01:30	3		2				5		13:30	94		109				203	
01:45	4	12	2	6			6	18	13:45	95	384	104	419			199	803
02:00	6		2				8		14:00	108		75				183	
02:15	2		1				3		14:15	84		93				177	
02:30	2		0				2		14:30	95		93				188	
02:45	1	11	2	5			3	16	14:45	112	399	90	351			202	750
03:00	0		3				3		15:00	103		108				211	
03:15	3		1				4		15:15	120		98				218	
03:30	2		12				14		15:30	102		108				210	
03:45	12	17	9	25			21	42	15:45	113	438	86	400			199	838
04:00	3		5				8		16:00	108		135				243	
04:15	7		3				10		16:15	129		100				229	
04:30	9		5				14		16:30	107		98				205	
04:45	19	38	12	25			31	63	16:45	122	466	117	450			239	916
05:00	10		10				20		17:00	116		135				251	
05:15	12		11				23		17:15	126		128				254	
05:30	17		21				38		17:30	117		110				227	
05:45	19	58	32	74			51	132	17:45	108	467	102	475			210	942
06:00	13		25				38		18:00	101		73				174	
06:15	37		29				66		18:15	91		103				194	
06:30	33		34				67		18:30	94		90				184	
06:45	58	141	29	117			87	258	18:45	95	381	69	335			164	716
07:00	51		55				106		19:00	91		73				164	
07:15	58		57				115		19:15	76		75				151	
07:30	67		84				151		19:30	65		51				116	
07:45	94	270	82	278			176	548	19:45	69	301	38	237			107	538
08:00	78		86				164		20:00	55		39				94	
08:15	66		81				147		20:15	45		48				93	
08:30	57		65				122		20:30	48		37				85	
08:45	51	252	67	299			118	551	20:45	50	198	34	158			84	356
09:00	59		54				113		21:00	41		25				66	
09:15	50		62				112		21:15	22		29				51	
09:30	53		56				109		21:30	20		28				48	
09:45	71	233	65	237			136	470	21:45	19	102	21	103			40	205
10:00	49		72				121		22:00	25		24				49	
10:15	65		58				123		22:15	25		15				40	
10:30	70		63				133		22:30	10		10				20	
10:45	63	247	74	267			137	514	22:45	16	76	9	58			25	134
11:00	65		71				136		23:00	10		8				18	
11:15	72		104				176		23:15	14		9				23	
11:30	80		88				168		23:30	18		11				29	
11:45	104	321	107	370			211	691	23:45	16	58	5	33			21	91
TOTALS		1619		1716				3335	TOTALS		3693		3414				7107
SPLIT %		48.5%		51.5%				31.9%	SPLIT %		52.0%		48.0%				68.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	5,312	5,130	0	0	10,442

AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	16:45	16:45			16:45
AM Pk Volume	422	401			823	PM Pk Volume	481	490			971
Pk Hr Factor	0.934	0.937			0.966	Pk Hr Factor	0.954	0.907			0.956
7 - 9 Volume	522	577	0	0	1099	4 - 6 Volume	933	925	0	0	1858
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	16:45	16:45			16:45
7 - 9 Pk Volume	305	333	0	0	638	4 - 6 Pk Volume	481	490	0	0	971
Pk Hr Factor	0.811	0.968	0.000	0.000	0.906	Pk Hr Factor	0.954	0.907	0.000	0.000	0.956

APPENDIX C

INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS - ICU

APPENDIX C-I

EXISTING TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.558

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	558	0	445	0	1366	619	0	1589	174
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	558	0	445	0	1366	619	0	1589	174
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	140	0	111	0	342	155	0	397	44
Total Analysis Volume [veh/h]	0	0	0	558	0	445	0	1366	619	0	1589	174
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.16	0.00	0.20	0.00	0.27	0.00	0.00	0.31	0.00
Intersection LOS	A											
Intersection V/C	0.558											

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.557

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	803	43	761	0	0	50	116	1241	515	0	1355	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	803	43	761	0	0	50	116	1241	515	0	1355	18
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	201	11	190	0	0	13	29	310	129	0	339	5
Total Analysis Volume [veh/h]	803	43	761	0	0	50	116	1241	515	0	1355	18
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.16	0.24	0.24	0.00	0.00	0.00	0.07	0.24	0.00	0.00	0.20	0.20
Intersection LOS	A											
Intersection V/C	0.557											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.603

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	228	6	298	53	28	8	2	883	294	332	724	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	228	6	298	53	28	8	2	883	294	332	724	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	2	75	13	7	2	1	221	74	83	181	3
Total Analysis Volume [veh/h]	228	6	298	53	28	8	2	883	294	332	724	10
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.08	0.03	0.02	0.02	0.00	0.35	0.35	0.10	0.22	0.22
Intersection LOS	B											
Intersection V/C	0.603											

Intersection Level Of Service Report
Intersection 4: S. Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.262

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Base Volume Input [veh/h]	37	381	14	18	447	13	6	1	30	40	8	39
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	381	14	18	447	13	6	1	30	40	8	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	95	4	5	112	3	2	0	8	10	2	10
Total Analysis Volume [veh/h]	37	381	14	18	447	13	6	1	30	40	8	39
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.12	0.12	0.01	0.14	0.14	0.00	0.02	0.02	0.02	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.262											

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.691

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	140	198	68	142	314	139	142	1758	95	88	1505	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	198	68	142	314	139	142	1758	95	88	1505	80
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	50	17	36	79	35	36	440	24	22	376	20
Total Analysis Volume [veh/h]	140	198	68	142	314	139	142	1758	95	88	1505	80
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.08	0.08	0.04	0.18	0.08	0.08	0.36	0.36	0.05	0.23	0.23
Intersection LOS	B											
Intersection V/C	0.691											

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.590

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	163	11	138	24	27	13	12	1721	339	167	1377	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	163	11	138	24	27	13	12	1721	339	167	1377	31
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	3	35	6	7	3	3	430	85	42	344	8
Total Analysis Volume [veh/h]	163	11	138	24	27	13	12	1721	339	167	1377	31
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.05	0.08	0.01	0.02	0.02	0.01	0.34	0.20	0.10	0.28	0.28
Intersection LOS	A											
Intersection V/C	0.590											

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.680

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	632	0	502	0	1567	862	0	2079	375
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	632	0	502	0	1567	862	0	2079	375
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	158	0	126	0	392	216	0	520	94
Total Analysis Volume [veh/h]	0	0	0	632	0	502	0	1567	862	0	2079	375
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.19	0.00	0.22	0.00	0.31	0.00	0.00	0.41	0.00
Intersection LOS	B											
Intersection V/C	0.680											

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.693

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	848	72	397	0	0	231	206	1670	345	0	2186	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	848	72	397	0	0	231	206	1670	345	0	2186	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	212	18	99	0	0	58	52	418	86	0	547	12
Total Analysis Volume [veh/h]	848	72	397	0	0	231	206	1670	345	0	2186	46
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.17	0.19	0.19	0.00	0.00	0.00	0.12	0.33	0.00	0.00	0.33	0.33
Intersection LOS	B											
Intersection V/C	0.693											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.602

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	447	31	333	10	19	6	12	828	278	275	1176	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	447	31	333	10	19	6	12	828	278	275	1176	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	112	8	83	3	5	2	3	207	70	69	294	4
Total Analysis Volume [veh/h]	447	31	333	10	19	6	12	828	278	275	1176	16
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.02	0.12	0.01	0.01	0.01	0.01	0.33	0.33	0.08	0.35	0.35
Intersection LOS	B											
Intersection V/C	0.602											

Intersection Level Of Service Report
Intersection 4: S. Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.286

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Base Volume Input [veh/h]	37	511	35	16	533	8	18	9	42	24	4	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	511	35	16	533	8	18	9	42	24	4	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	128	9	4	133	2	5	2	11	6	1	9
Total Analysis Volume [veh/h]	37	511	35	16	533	8	18	9	42	24	4	34
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.16	0.16	0.01	0.16	0.16	0.01	0.04	0.04	0.01	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.286											

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.763

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	205	247	80	278	333	212	240	1697	132	167	1597	163
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	205	247	80	278	333	212	240	1697	132	167	1597	163
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	62	20	70	83	53	60	424	33	42	399	41
Total Analysis Volume [veh/h]	205	247	80	278	333	212	240	1697	132	167	1597	163
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.10	0.10	0.08	0.20	0.12	0.14	0.36	0.36	0.10	0.26	0.26
Intersection LOS	C											
Intersection V/C	0.763											

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.684

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	224	45	253	24	22	13	18	1713	263	219	1764	54
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	224	45	253	24	22	13	18	1713	263	219	1764	54
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	11	63	6	6	3	5	428	66	55	441	14
Total Analysis Volume [veh/h]	224	45	253	24	22	13	18	1713	263	219	1764	54
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.08	0.15	0.01	0.02	0.02	0.01	0.34	0.15	0.13	0.36	0.36
Intersection LOS	B											
Intersection V/C	0.684											

APPENDIX C-II

YEAR 2024 CUMULATIVE TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.638

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	577	0	501	0	1479	796	0	1921	180
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	577	0	501	0	1479	796	0	1921	180
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	144	0	125	0	370	199	0	480	45
Total Analysis Volume [veh/h]	0	0	0	577	0	501	0	1479	796	0	1921	180
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.17	0.00	0.21	0.00	0.29	0.00	0.00	0.38	0.00
Intersection LOS	B											
Intersection V/C	0.638											

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.615

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1037	44	784	0	0	53	121	1333	548	0	1474	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1037	44	784	0	0	53	121	1333	548	0	1474	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	259	11	196	0	0	13	30	333	137	0	369	5
Total Analysis Volume [veh/h]	1037	44	784	0	0	53	121	1333	548	0	1474	19
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.27	0.27	0.00	0.00	0.00	0.07	0.26	0.00	0.00	0.22	0.22
Intersection LOS	B											
Intersection V/C	0.615											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.628

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	235	6	307	55	29	8	2	937	303	342	763	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	235	6	307	55	29	8	2	937	303	342	763	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	59	2	77	14	7	2	1	234	76	86	191	3
Total Analysis Volume [veh/h]	235	6	307	55	29	8	2	937	303	342	763	10
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.08	0.03	0.02	0.02	0.00	0.36	0.36	0.10	0.23	0.23
Intersection LOS	B											
Intersection V/C	0.628											

Intersection Level Of Service Report
Intersection 4: S. Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.269

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Base Volume Input [veh/h]	39	392	15	19	460	13	6	1	32	42	8	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	392	15	19	460	13	6	1	32	42	8	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	98	4	5	115	3	2	0	8	11	2	10
Total Analysis Volume [veh/h]	39	392	15	19	460	13	6	1	32	42	8	40
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.12	0.12	0.01	0.14	0.14	0.00	0.02	0.02	0.02	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.269											

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.721

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	148	204	70	146	323	146	147	1859	101	91	1621	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	148	204	70	146	323	146	147	1859	101	91	1621	82
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	51	18	37	81	37	37	465	25	23	405	21
Total Analysis Volume [veh/h]	148	204	70	146	323	146	147	1859	101	91	1621	82
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.08	0.08	0.04	0.19	0.09	0.09	0.38	0.38	0.05	0.25	0.25
Intersection LOS	C											
Intersection V/C	0.721											

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.615

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	179	11	142	25	28	13	12	1814	358	172	1478	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	179	11	142	25	28	13	12	1814	358	172	1478	32
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	45	3	36	6	7	3	3	454	90	43	370	8
Total Analysis Volume [veh/h]	179	11	142	25	28	13	12	1814	358	172	1478	32
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.06	0.08	0.01	0.02	0.02	0.01	0.36	0.21	0.10	0.30	0.30
Intersection LOS	B											
Intersection V/C	0.615											

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.764

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	653	0	548	0	1701	1051	0	2442	388
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	653	0	548	0	1701	1051	0	2442	388
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	163	0	137	0	425	263	0	611	97
Total Analysis Volume [veh/h]	0	0	0	653	0	548	0	1701	1051	0	2442	388
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.19	0.00	0.24	0.00	0.33	0.00	0.00	0.48	0.00
Intersection LOS	C											
Intersection V/C	0.764											

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1089	74	409	0	0	239	213	1796	371	0	2340	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1089	74	409	0	0	239	213	1796	371	0	2340	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	272	19	102	0	0	60	53	449	93	0	585	12
Total Analysis Volume [veh/h]	1089	74	409	0	0	239	213	1796	371	0	2340	47
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.23	0.23	0.00	0.00	0.00	0.13	0.35	0.00	0.00	0.35	0.35
Intersection LOS	C											
Intersection V/C	0.758											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.625

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	460	32	343	10	20	6	12	874	286	283	1241	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	460	32	343	10	20	6	12	874	286	283	1241	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	115	8	86	3	5	2	3	219	72	71	310	4
Total Analysis Volume [veh/h]	460	32	343	10	20	6	12	874	286	283	1241	16
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.02	0.12	0.01	0.02	0.02	0.01	0.34	0.34	0.08	0.37	0.37
Intersection LOS	B											
Intersection V/C	0.625											

Intersection Level Of Service Report
Intersection 4: S. Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.296

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Base Volume Input [veh/h]	39	526	37	16	549	8	19	9	45	27	4	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	526	37	16	549	8	19	9	45	27	4	35
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	132	9	4	137	2	5	2	11	7	1	9
Total Analysis Volume [veh/h]	39	526	37	16	549	8	19	9	45	27	4	35
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.17	0.17	0.01	0.16	0.16	0.01	0.04	0.04	0.02	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.296											

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.800

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	217	254	82	286	343	223	249	1817	139	172	1721	168
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	217	254	82	286	343	223	249	1817	139	172	1721	168
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	64	21	72	86	56	62	454	35	43	430	42
Total Analysis Volume [veh/h]	217	254	82	286	343	223	249	1817	139	172	1721	168
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.10	0.10	0.08	0.20	0.13	0.15	0.38	0.38	0.10	0.28	0.28
Intersection LOS	D											
Intersection V/C	0.800											

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.716

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	250	46	261	25	23	13	19	1826	281	226	1875	56
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	250	46	261	25	23	13	19	1826	281	226	1875	56
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	12	65	6	6	3	5	457	70	57	469	14
Total Analysis Volume [veh/h]	250	46	261	25	23	13	19	1826	281	226	1875	56
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.09	0.15	0.01	0.02	0.02	0.01	0.36	0.17	0.13	0.38	0.38
Intersection LOS	C											
Intersection V/C	0.716											

APPENDIX C-III

YEAR 2024 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	580	0	501	0	1494	796	0	1949	189
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	580	0	501	0	1494	796	0	1949	189
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	145	0	125	0	374	199	0	487	47
Total Analysis Volume [veh/h]	0	0	0	580	0	501	0	1494	796	0	1949	189
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.17	0.00	0.21	0.00	0.29	0.00	0.00	0.38	0.00
Intersection LOS	B											
Intersection V/C	0.644											

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.604

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1037	31	804	0	0	87	100	1373	548	0	1482	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1037	31	804	0	0	87	100	1373	548	0	1482	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	259	8	201	0	0	22	25	343	137	0	371	4
Total Analysis Volume [veh/h]	1037	31	804	0	0	87	100	1373	548	0	1482	14
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.28	0.28	0.00	0.00	0.00	0.06	0.27	0.00	0.00	0.22	0.22
Intersection LOS	B											
Intersection V/C	0.604											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.631

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	239	6	311	55	29	8	2	937	306	344	763	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	239	6	311	55	29	8	2	937	306	344	763	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	2	78	14	7	2	1	234	77	86	191	3
Total Analysis Volume [veh/h]	239	6	311	55	29	8	2	937	306	344	763	10
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.08	0.03	0.02	0.02	0.00	0.37	0.37	0.10	0.23	0.23
Intersection LOS	B											
Intersection V/C	0.631											

Intersection Level Of Service Report
Intersection 4: S. Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.313

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Base Volume Input [veh/h]	110	399	15	19	459	20	7	1	42	42	8	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	399	15	19	459	20	7	1	42	42	8	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	100	4	5	115	5	2	0	11	11	2	10
Total Analysis Volume [veh/h]	110	399	15	19	459	20	7	1	42	42	8	40
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.12	0.12	0.01	0.14	0.14	0.00	0.03	0.03	0.02	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.313											

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.723

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	148	205	70	155	325	154	207	1859	101	91	1616	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	148	205	70	155	325	154	207	1859	101	91	1616	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	51	18	39	81	39	52	465	25	23	404	24
Total Analysis Volume [veh/h]	148	205	70	155	325	154	207	1859	101	91	1616	94
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.08	0.08	0.05	0.19	0.09	0.12	0.38	0.38	0.05	0.25	0.25
Intersection LOS	C											
Intersection V/C	0.723											

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.616

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	179	11	142	25	28	13	12	1823	359	172	1484	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	179	11	142	25	28	13	12	1823	359	172	1484	32
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	45	3	36	6	7	3	3	456	90	43	371	8
Total Analysis Volume [veh/h]	179	11	142	25	28	13	12	1823	359	172	1484	32
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.06	0.08	0.01	0.02	0.02	0.01	0.36	0.21	0.10	0.30	0.30
Intersection LOS	B											
Intersection V/C	0.616											

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.760

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	651	0	548	0	1682	1051	0	2424	384
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	651	0	548	0	1682	1051	0	2424	384
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	163	0	137	0	421	263	0	606	96
Total Analysis Volume [veh/h]	0	0	0	651	0	548	0	1682	1051	0	2424	384
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.19	0.00	0.24	0.00	0.33	0.00	0.00	0.48	0.00
Intersection LOS	C											
Intersection V/C	0.760											

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.741

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1090	64	413	0	0	192	182	1805	371	0	2363	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1090	64	413	0	0	192	182	1805	371	0	2363	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	273	16	103	0	0	48	46	451	93	0	591	10
Total Analysis Volume [veh/h]	1090	64	413	0	0	192	182	1805	371	0	2363	38
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.23	0.23	0.00	0.00	0.00	0.11	0.35	0.00	0.00	0.35	0.35
Intersection LOS	C											
Intersection V/C	0.741											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.625

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	460	32	342	10	20	6	12	874	286	283	1241	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	460	32	342	10	20	6	12	874	286	283	1241	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	115	8	86	3	5	2	3	219	72	71	310	4
Total Analysis Volume [veh/h]	460	32	342	10	20	6	12	874	286	283	1241	16
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.02	0.12	0.01	0.02	0.02	0.01	0.34	0.34	0.08	0.37	0.37
Intersection LOS	B											
Intersection V/C	0.625											

Intersection Level Of Service Report
Intersection 4: S. Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.339

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Base Volume Input [veh/h]	51	522	37	16	547	9	24	9	102	27	4	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	51	522	37	16	547	9	24	9	102	27	4	35
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	131	9	4	137	2	6	2	26	7	1	9
Total Analysis Volume [veh/h]	51	522	37	16	547	9	24	9	102	27	4	35
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.16	0.16	0.01	0.16	0.16	0.01	0.08	0.08	0.02	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.339											

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	216	254	82	278	343	249	260	1820	139	172	1712	173
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	216	254	82	278	343	249	260	1820	139	172	1712	173
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	64	21	70	86	62	65	455	35	43	428	43
Total Analysis Volume [veh/h]	216	254	82	278	343	249	260	1820	139	172	1712	173
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.10	0.10	0.08	0.20	0.15	0.15	0.38	0.38	0.10	0.28	0.28
Intersection LOS	D											
Intersection V/C	0.801											

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.715

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	248	46	261	25	23	13	19	1825	277	226	1873	56
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	248	46	261	25	23	13	19	1825	277	226	1873	56
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	12	65	6	6	3	5	456	69	57	468	14
Total Analysis Volume [veh/h]	248	46	261	25	23	13	19	1825	277	226	1873	56
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.09	0.15	0.01	0.02	0.02	0.01	0.36	0.16	0.13	0.38	0.38
Intersection LOS	C											
Intersection V/C	0.715											

APPENDIX C-IV

YEAR 2045 GENERAL PLAN BUILDOUT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.675

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	606	0	562	0	1697	836	0	2020	189
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	606	0	562	0	1697	836	0	2020	189
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	152	0	141	0	424	209	0	505	47
Total Analysis Volume [veh/h]	0	0	0	606	0	562	0	1697	836	0	2020	189
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.18	0.00	0.23	0.00	0.33	0.00	0.00	0.40	0.00
Intersection LOS	B											
Intersection V/C	0.675											

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1089	43	811	0	0	50	116	1520	575	0	1615	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1089	43	811	0	0	50	116	1520	575	0	1615	18
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	272	11	203	0	0	13	29	380	144	0	404	5
Total Analysis Volume [veh/h]	1089	43	811	0	0	50	116	1520	575	0	1615	18
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.29	0.29	0.00	0.00	0.00	0.07	0.30	0.00	0.00	0.24	0.24
Intersection LOS	B											
Intersection V/C	0.644											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.647

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	247	6	323	58	30	8	2	950	318	368	814	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	247	6	323	58	30	8	2	950	318	368	814	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	2	81	15	8	2	1	238	80	92	204	3
Total Analysis Volume [veh/h]	247	6	323	58	30	8	2	950	318	368	814	11
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.08	0.03	0.02	0.02	0.00	0.37	0.37	0.11	0.24	0.24
Intersection LOS	B											
Intersection V/C	0.647											

Intersection Level Of Service Report
Intersection 4: S. Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.301

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Base Volume Input [veh/h]	56	413	16	20	492	22	19	1	38	44	8	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	413	16	20	492	22	19	1	38	44	8	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	103	4	5	123	6	5	0	10	11	2	11
Total Analysis Volume [veh/h]	56	413	16	20	492	22	19	1	38	44	8	42
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.13	0.13	0.01	0.15	0.15	0.01	0.03	0.03	0.03	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.301											

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.799

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	150	217	93	153	345	153	154	2166	106	96	1794	86
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	217	93	153	345	153	154	2166	106	96	1794	86
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	54	23	38	86	38	39	542	27	24	449	22
Total Analysis Volume [veh/h]	150	217	93	153	345	153	154	2166	106	96	1794	86
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.09	0.09	0.05	0.20	0.09	0.09	0.45	0.45	0.06	0.28	0.28
Intersection LOS	C											
Intersection V/C	0.799											

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.673

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	191	12	149	26	29	14	14	2000	478	201	1643	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	191	12	149	26	29	14	14	2000	478	201	1643	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	3	37	7	7	4	4	500	120	50	411	9
Total Analysis Volume [veh/h]	191	12	149	26	29	14	14	2000	478	201	1643	34
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.06	0.09	0.02	0.03	0.03	0.01	0.39	0.28	0.12	0.33	0.33
Intersection LOS	B											
Intersection V/C	0.673											

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.805

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	683	0	601	0	1889	1104	0	2565	407
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	683	0	601	0	1889	1104	0	2565	407
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	171	0	150	0	472	276	0	641	102
Total Analysis Volume [veh/h]	0	0	0	683	0	601	0	1889	1104	0	2565	407
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.20	0.00	0.25	0.00	0.37	0.00	0.00	0.50	0.00
Intersection LOS	D											
Intersection V/C	0.805											

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.791

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1143	72	430	0	0	231	206	1799	390	0	2526	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1143	72	430	0	0	231	206	1799	390	0	2526	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	286	18	108	0	0	58	52	450	98	0	632	12
Total Analysis Volume [veh/h]	1143	72	430	0	0	231	206	1799	390	0	2526	46
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.24	0.24	0.00	0.00	0.00	0.12	0.35	0.00	0.00	0.38	0.38
Intersection LOS	C											
Intersection V/C	0.791											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.646

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	483	34	368	11	21	6	12	889	300	300	1248	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	483	34	368	11	21	6	12	889	300	300	1248	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	121	9	92	3	5	2	3	222	75	75	312	4
Total Analysis Volume [veh/h]	483	34	368	11	21	6	12	889	300	300	1248	17
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.02	0.13	0.01	0.02	0.02	0.01	0.35	0.35	0.09	0.37	0.37
Intersection LOS	B											
Intersection V/C	0.646											

Intersection Level Of Service Report
Intersection 4: S. Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.319

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Base Volume Input [veh/h]	44	560	39	17	579	18	36	9	42	28	4	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	560	39	17	579	18	36	9	42	28	4	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	140	10	4	145	5	9	2	11	7	1	9
Total Analysis Volume [veh/h]	44	560	39	17	579	18	36	9	42	28	4	37
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.18	0.18	0.01	0.18	0.18	0.02	0.05	0.05	0.02	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.319											

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.851

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	228	272	103	302	363	234	261	1879	146	210	1950	176
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	228	272	103	302	363	234	261	1879	146	210	1950	176
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	68	26	76	91	59	65	470	37	53	488	44
Total Analysis Volume [veh/h]	228	272	103	302	363	234	261	1879	146	210	1950	176
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.11	0.11	0.09	0.21	0.14	0.15	0.40	0.40	0.12	0.31	0.31
Intersection LOS	D											
Intersection V/C	0.851											

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.749

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	274	48	277	26	24	14	20	1910	295	237	2116	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	274	48	277	26	24	14	20	1910	295	237	2116	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	12	69	7	6	4	5	478	74	59	529	15
Total Analysis Volume [veh/h]	274	48	277	26	24	14	20	1910	295	237	2116	59
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.09	0.16	0.02	0.02	0.02	0.01	0.37	0.17	0.14	0.43	0.43
Intersection LOS	C											
Intersection V/C	0.749											

APPENDIX C-V

YEAR 2045 GENERAL PLAN BUILDOUT PLUS PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.681

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	609	0	562	0	1712	836	0	2048	198
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	609	0	562	0	1712	836	0	2048	198
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	152	0	141	0	428	209	0	512	50
Total Analysis Volume [veh/h]	0	0	0	609	0	562	0	1712	836	0	2048	198
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

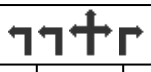
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.18	0.00	0.23	0.00	0.34	0.00	0.00	0.40	0.00
Intersection LOS	B											
Intersection V/C	0.681											

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1089	30	831	0	0	84	95	1560	575	0	1623	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1089	30	831	0	0	84	95	1560	575	0	1623	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	272	8	208	0	0	21	24	390	144	0	406	3
Total Analysis Volume [veh/h]	1089	30	831	0	0	84	95	1560	575	0	1623	13
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.29	0.29	0.00	0.00	0.00	0.06	0.31	0.00	0.00	0.24	0.24
Intersection LOS	B											
Intersection V/C	0.643											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	2	82	15	8	2	1	238	80	93	204	3
Total Analysis Volume [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.08	0.03	0.02	0.02	0.00	0.37	0.37	0.11	0.24	0.24
Intersection LOS	B											
Intersection V/C	0.650											

Intersection Level Of Service Report
Intersection 4: S. Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.345

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Base Volume Input [veh/h]	127	420	16	20	491	29	20	1	48	44	8	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	127	420	16	20	491	29	20	1	48	44	8	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	105	4	5	123	7	5	0	12	11	2	11
Total Analysis Volume [veh/h]	127	420	16	20	491	29	20	1	48	44	8	42
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.13	0.13	0.01	0.15	0.15	0.01	0.04	0.04	0.03	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.345											

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.800

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	150	218	93	162	347	161	214	2166	106	96	1789	98
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	218	93	162	347	161	214	2166	106	96	1789	98
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	55	23	41	87	40	54	542	27	24	447	25
Total Analysis Volume [veh/h]	150	218	93	162	347	161	214	2166	106	96	1789	98
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.09	0.09	0.05	0.20	0.09	0.13	0.45	0.45	0.06	0.28	0.28
Intersection LOS	D											
Intersection V/C	0.800											

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.675

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	191	12	149	26	29	14	14	2009	479	201	1649	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	191	12	149	26	29	14	14	2009	479	201	1649	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	3	37	7	7	4	4	502	120	50	412	9
Total Analysis Volume [veh/h]	191	12	149	26	29	14	14	2009	479	201	1649	34
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.06	0.09	0.02	0.03	0.03	0.01	0.39	0.28	0.12	0.33	0.33
Intersection LOS	B											
Intersection V/C	0.675											

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	681	0	601	0	1870	1104	0	2547	403
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	681	0	601	0	1870	1104	0	2547	403
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	170	0	150	0	468	276	0	637	101
Total Analysis Volume [veh/h]	0	0	0	681	0	601	0	1870	1104	0	2547	403
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.20	0.00	0.25	0.00	0.37	0.00	0.00	0.50	0.00
Intersection LOS	D											
Intersection V/C	0.801											

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.774

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1144	62	434	0	0	184	175	1808	390	0	2549	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1144	62	434	0	0	184	175	1808	390	0	2549	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	286	16	109	0	0	46	44	452	98	0	637	9
Total Analysis Volume [veh/h]	1144	62	434	0	0	184	175	1808	390	0	2549	37
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.24	0.24	0.00	0.00	0.00	0.10	0.35	0.00	0.00	0.38	0.38
Intersection LOS	C											
Intersection V/C	0.774											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.646

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	121	9	92	3	5	2	3	222	75	75	312	4
Total Analysis Volume [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.02	0.13	0.01	0.02	0.02	0.01	0.35	0.35	0.09	0.37	0.37
Intersection LOS	B											
Intersection V/C	0.646											

Intersection Level Of Service Report
Intersection 4: S. Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.362

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Greenbriar Ln			Greenbriar Ln		
Base Volume Input [veh/h]	56	556	39	17	577	19	41	9	99	28	4	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	556	39	17	577	19	41	9	99	28	4	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	139	10	4	144	5	10	2	25	7	1	9
Total Analysis Volume [veh/h]	56	556	39	17	577	19	41	9	99	28	4	37
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.18	0.18	0.01	0.18	0.18	0.02	0.09	0.09	0.02	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.362											

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.851

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	227	272	103	294	363	260	272	1882	146	210	1941	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	227	272	103	294	363	260	272	1882	146	210	1941	181
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	68	26	74	91	65	68	471	37	53	485	45
Total Analysis Volume [veh/h]	227	272	103	294	363	260	272	1882	146	210	1941	181
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.11	0.11	0.09	0.21	0.15	0.16	0.40	0.40	0.12	0.31	0.31
Intersection LOS	D											
Intersection V/C	0.851											

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.749

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	272	48	277	26	24	14	20	1909	291	237	2114	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	272	48	277	26	24	14	20	1909	291	237	2114	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	12	69	7	6	4	5	477	73	59	529	15
Total Analysis Volume [veh/h]	272	48	277	26	24	14	20	1909	291	237	2114	59
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.09	0.16	0.02	0.02	0.02	0.01	0.37	0.17	0.14	0.43	0.43
Intersection LOS	C											
Intersection V/C	0.749											

APPENDIX D

INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS - HCM

APPENDIX D-I

EXISTING TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	14.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.557

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	558	0	445	0	1366	619	0	1589	174
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	558	0	445	0	1366	619	0	1589	174
Peak Hour Factor	1.0000	1.0000	1.0000	0.8810	1.0000	0.8810	1.0000	0.9270	0.9270	1.0000	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	158	0	126	0	368	167	0	423	46
Total Analysis Volume [veh/h]	0	0	0	633	0	505	0	1474	668	0	1690	185
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	0	6	0	0	6	0
Maximum Green [s]	0	0	0	30	0	0	0	30	0	0	30	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	64	0	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall				No				No			No	
Maximum Recall				No				No			No	
Pedestrian Recall				No				No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	C	R	C	C
C, Cycle Length [s]		90	90	90	90	90
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		23	23	23	59	59
g / C, Green / Cycle		0.26	0.26	0.26	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate		0.21	0.21	0.20	0.26	0.30
s, saturation flow rate [veh/h]		1800	1800	1900	5700	5700
c, Capacity [veh/h]		461	461	486	3734	3734
d1, Uniform Delay [s]		31.51	31.51	31.08	7.21	7.60
k, delay calibration		0.11	0.11	0.11	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.77	3.77	2.76	0.31	0.40
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.82	0.82	0.78	0.39	0.45
d, Delay for Lane Group [s/veh]		35.28	35.28	33.84	7.52	7.99
Lane Group LOS		D	D	C	A	A
Critical Lane Group		Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.02	8.02	7.81	3.91	4.74
50th-Percentile Queue Length [ft/ln]		200.54	200.54	195.22	97.85	118.39
95th-Percentile Queue Length [veh/ln]		12.67	12.67	12.39	7.04	8.30
95th-Percentile Queue Length [ft/ln]		316.66	316.66	309.79	176.12	207.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	35.28	0.00	34.20	0.00	7.52	0.00	0.00	7.99	0.00
Movement LOS				D		C		A			A	
d_A, Approach Delay [s/veh]	0.00			34.80			7.52			7.99		
Approach LOS	A			C			A			A		
d_I, Intersection Delay [s/veh]	14.92											
Intersection LOS	B											
Intersection V/C	0.557											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.408	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1333	489	489
d_b, Bicycle Delay [s]	45.00	5.00	25.69	25.69
l_b,int, Bicycle LOS Score for Intersection	4.132	3.437	2.370	2.489
Bicycle LOS	D	C	B	B

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	22.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.605

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	803	43	761	0	0	50	116	1241	515	0	1355	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	803	43	761	0	0	50	116	1241	515	0	1355	18
Peak Hour Factor	0.9080	0.9080	0.9080	1.0000	1.0000	0.6820	0.8790	0.8790	0.8790	1.0000	0.8940	0.8940
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	221	12	210	0	0	18	33	353	146	0	379	5
Total Analysis Volume [veh/h]	884	47	838	0	0	73	132	1412	586	0	1516	20
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	6	6	6	0	0	6	0
Maximum Green [s]	0	30	0	0	0	30	30	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	37	0	0	0	13	13	43	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	22	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No		No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No	No	No			No	
Maximum Recall		No				No	No	No			No	
Pedestrian Recall		No				No	No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	R	L	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	28	28	28	8	8	50	38	38
g / C, Green / Cycle	0.31	0.31	0.31	0.09	0.09	0.55	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.25	0.25	0.24	0.02	0.07	0.25	0.20	0.20
s, saturation flow rate [veh/h]	3500	1800	1900	3800	1800	5700	5700	1900
c, Capacity [veh/h]	1095	563	594	351	166	3151	2372	791
d1, Uniform Delay [s]	28.35	28.37	27.88	37.88	40.09	11.98	19.26	19.26
k, delay calibration	0.11	0.15	0.13	0.11	0.11	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.37	3.59	2.30	0.29	8.32	0.46	0.71	2.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.80	0.76	0.21	0.79	0.45	0.49	0.49
d, Delay for Lane Group [s/veh]	29.72	31.95	30.18	38.17	48.41	12.45	19.97	21.39
Lane Group LOS	C	C	C	D	D	B	B	C
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.51	9.12	8.79	0.75	3.21	5.32	5.79	6.10
50th-Percentile Queue Length [ft/ln]	212.83	227.94	219.74	18.82	80.28	133.07	144.65	152.42
95th-Percentile Queue Length [veh/ln]	13.30	14.07	13.65	1.36	5.78	9.11	9.73	10.15
95th-Percentile Queue Length [ft/ln]	332.45	351.75	341.29	33.88	144.50	227.67	243.27	253.66

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.72	31.95	31.02	0.00	0.00	38.17	48.41	12.45	0.00	0.00	20.31	21.39
Movement LOS	C	C	C			D	D	B			C	C
d_A, Approach Delay [s/veh]	30.40			38.17			15.52			20.33		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	22.71											
Intersection LOS	C											
Intersection V/C	0.605											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.644	2.197	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	733	200	867	578
d_b, Bicycle Delay [s]	18.05	36.45	14.45	22.76
l_b,int, Bicycle LOS Score for Intersection	4.478	1.560	2.409	2.193
Bicycle LOS	E	A	B	B

Sequence

Ring 1	-	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	27.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.785

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	228	6	298	53	28	8	2	883	294	332	724	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	228	6	298	53	28	8	2	883	294	332	724	10
Peak Hour Factor	0.8160	0.8160	0.8160	0.7410	0.7410	0.7410	0.8560	0.8560	0.8560	0.9140	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	2	91	18	9	3	1	258	86	91	198	3
Total Analysis Volume [veh/h]	279	7	365	72	38	11	2	1032	343	363	792	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	18	55	0	0	37	0	10	38	0	17	45	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	24	24	9	9	0	61	61	13	74	74
g / C, Green / Cycle	0.10	0.21	0.21	0.08	0.08	0.00	0.56	0.56	0.12	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.08	0.00	0.19	0.04	0.03	0.00	0.38	0.35	0.10	0.21	0.21
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	1900	1900	3500	1900	1900
c, Capacity [veh/h]	348	409	409	174	151	8	1058	1058	415	1276	1276
d1, Uniform Delay [s]	48.52	34.02	41.95	48.57	47.86	54.64	17.29	16.59	47.71	7.54	7.54
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.32	0.02	6.88	1.58	1.22	16.65	3.43	2.80	5.88	0.65	0.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.02	0.89	0.41	0.32	0.26	0.67	0.63	0.87	0.32	0.31
d, Delay for Lane Group [s/veh]	52.85	34.03	48.83	50.15	49.09	71.29	20.72	19.39	53.59	8.19	8.18
Lane Group LOS	D	C	D	D	D	E	C	B	D	A	A
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.95	0.15	10.32	1.97	1.32	0.09	13.14	11.65	5.21	3.87	3.85
50th-Percentile Queue Length [ft/ln]	98.67	3.76	258.02	49.25	33.04	2.28	328.48	291.14	130.31	96.83	96.26
95th-Percentile Queue Length [veh/ln]	7.10	0.27	15.59	3.55	2.38	0.16	19.08	17.24	8.96	6.97	6.93
95th-Percentile Queue Length [ft/ln]	177.60	6.76	389.73	88.65	59.47	4.10	477.09	431.06	223.92	174.30	173.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.85	34.03	48.83	50.15	49.09	49.09	71.29	20.30	19.39	53.59	8.19	8.18
Movement LOS	D	C	D	D	D	D	E	C	B	D	A	A
d_A, Approach Delay [s/veh]	50.39			49.72			20.15			22.32		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	27.93											
Intersection LOS	C											
Intersection V/C	0.785											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
l_p,int, Pedestrian LOS Score for Intersection	2.689	1.996	2.789	2.993
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	927	600	618	745
d_b, Bicycle Delay [s]	15.82	26.95	26.25	21.64
l_b,int, Bicycle LOS Score for Intersection	2.634	1.759	2.696	2.522
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: S.Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	8.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.229

Intersection Setup

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Base Volume Input [veh/h]	37	381	14	18	447	13	6	1	30	40	8	39
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	381	14	18	447	13	6	1	30	40	8	39
Peak Hour Factor	0.8160	0.8160	0.8160	0.9430	0.9430	0.9430	0.6670	0.6670	0.6670	0.6100	0.6100	0.6100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	117	4	5	119	3	2	0	11	16	3	16
Total Analysis Volume [veh/h]	45	467	17	19	474	14	9	1	45	66	13	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	73	73	73	73	73	73	9	9
g / C, Green / Cycle	0.81	0.81	0.81	0.81	0.81	0.81	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.03	0.13	0.13	0.01	0.13	0.13	0.03	0.08
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1900	1800	1800
c, Capacity [veh/h]	1423	1540	1540	1424	1540	1540	227	239
d1, Uniform Delay [s]	1.65	1.85	1.85	1.63	1.85	1.85	37.49	39.48
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.04	0.22	0.22	0.02	0.22	0.22	0.54	2.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.03	0.16	0.16	0.01	0.16	0.16	0.24	0.60
d, Delay for Lane Group [s/veh]	1.69	2.07	2.06	1.65	2.07	2.07	38.04	41.87
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.10	0.61	0.60	0.04	0.61	0.61	1.15	3.20
50th-Percentile Queue Length [ft/ln]	2.53	15.18	15.01	1.05	15.30	15.17	28.64	80.03
95th-Percentile Queue Length [veh/ln]	0.18	1.09	1.08	0.08	1.10	1.09	2.06	5.76
95th-Percentile Queue Length [ft/ln]	4.56	27.32	27.01	1.89	27.55	27.30	51.56	144.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.69	2.07	2.06	1.65	2.07	2.07	38.04	38.04	38.04	41.87	41.87	41.87
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.03			2.05			38.04			41.87		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	8.26											
Intersection LOS	A											
Intersection V/C	0.229											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.610	2.516	1.840	1.829
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	444	444	1378	1378
d_b, Bicycle Delay [s]	27.22	27.22	4.36	4.36
l_b,int, Bicycle LOS Score for Intersection	1.996	1.978	1.650	1.796
Bicycle LOS	A	A	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	140	198	68	142	314	139	142	1758	95	88	1505	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	198	68	142	314	139	142	1758	95	88	1505	80
Peak Hour Factor	0.8870	0.8870	0.8870	0.9320	0.9320	0.9320	0.9120	0.9120	0.9120	0.9620	0.9620	0.9620
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	56	19	38	84	37	39	482	26	23	391	21
Total Analysis Volume [veh/h]	158	223	77	152	337	149	156	1928	104	91	1564	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	39	0	11	40	0	14	40	0	10	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	29	0	0	26	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	20	20	6	20	20	10	52	52	6	48	48
g / C, Green / Cycle	0.06	0.20	0.20	0.06	0.20	0.20	0.10	0.52	0.52	0.06	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.05	0.08	0.08	0.04	0.18	0.08	0.09	0.35	0.36	0.05	0.21	0.23
s, saturation flow rate [veh/h]	3500	1900	1900	3500	1900	1900	1800	3800	1900	1800	5700	1900
c, Capacity [veh/h]	213	383	383	220	387	387	181	1957	978	110	2708	903
d1, Uniform Delay [s]	46.25	34.76	34.57	45.96	38.61	34.46	44.34	18.21	18.51	46.51	17.53	17.85
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.03	0.69	0.62	3.83	6.15	0.63	11.28	1.98	4.28	14.62	0.54	1.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.40	0.38	0.69	0.87	0.39	0.86	0.69	0.71	0.83	0.45	0.48
d, Delay for Lane Group [s/veh]	51.28	35.45	35.18	49.79	44.76	35.09	55.62	20.18	22.79	61.14	18.07	19.66
Lane Group LOS	D	D	D	D	D	D	E	C	C	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.07	3.33	3.10	1.96	8.55	3.18	4.35	11.49	12.63	2.67	6.15	6.98
50th-Percentile Queue Length [ft/ln]	51.77	83.29	77.53	48.96	213.82	79.55	108.66	287.29	315.78	66.79	153.70	174.43
95th-Percentile Queue Length [veh/ln]	3.73	6.00	5.58	3.53	13.35	5.73	7.77	17.05	18.46	4.81	10.21	11.31
95th-Percentile Queue Length [ft/ln]	93.19	149.91	139.55	88.13	333.72	143.20	194.14	426.28	461.50	120.23	255.36	282.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.28	35.37	35.18	49.79	44.76	35.09	55.62	20.98	22.79	61.14	18.42	19.66
Movement LOS	D	D	D	D	D	D	E	C	C	E	B	B
d_A, Approach Delay [s/veh]	40.83			43.70			23.53			20.72		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	26.70											
Intersection LOS	C											
Intersection V/C	0.758											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.619	2.636	3.225	3.205
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	720	720	640
d_b, Bicycle Delay [s]	21.13	20.48	20.48	23.12
l_b,int, Bicycle LOS Score for Intersection	1.937	2.612	2.763	2.277
Bicycle LOS	A	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	163	11	138	24	27	13	12	1721	339	167	1377	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	163	11	138	24	27	13	12	1721	339	167	1377	31
Peak Hour Factor	0.8320	0.8320	0.8320	0.6740	0.6740	0.6740	0.9510	0.9510	0.9510	0.8930	0.8930	0.8930
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	3	41	9	10	5	3	452	89	47	385	9
Total Analysis Volume [veh/h]	196	13	166	36	40	19	13	1810	356	187	1542	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	26	0	0	10	0	10	32	0	22	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	10	5	5	2	47	47	11	56	56
g / C, Green / Cycle	0.12	0.12	0.12	0.06	0.06	0.02	0.52	0.52	0.13	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate	0.06	0.06	0.09	0.02	0.03	0.01	0.32	0.19	0.10	0.27	0.28
s, saturation flow rate [veh/h]	1800	1800	1900	1800	1900	1800	5700	1900	1800	3800	1900
c, Capacity [veh/h]	209	209	221	111	117	36	2956	985	227	2374	1187
d1, Uniform Delay [s]	37.32	37.46	38.59	40.52	40.98	43.63	15.32	12.86	38.42	8.73	8.86
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.73	1.95	5.10	1.68	3.33	6.05	0.96	1.03	7.30	0.59	1.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.51	0.75	0.32	0.50	0.36	0.61	0.36	0.82	0.44	0.45
d, Delay for Lane Group [s/veh]	39.05	39.41	43.68	42.19	44.31	49.68	16.27	13.89	45.72	9.32	10.12
Lane Group LOS	D	D	D	D	D	D	B	B	D	A	B
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.17	2.32	3.81	0.81	1.36	0.34	8.34	4.28	4.42	4.81	5.28
50th-Percentile Queue Length [ft/ln]	54.20	57.89	95.30	20.22	34.08	8.60	208.38	107.06	110.62	120.31	132.11
95th-Percentile Queue Length [veh/ln]	3.90	4.17	6.86	1.46	2.45	0.62	13.07	7.68	7.87	8.41	9.05
95th-Percentile Queue Length [ft/ln]	97.56	104.20	171.55	36.40	61.35	15.47	326.75	191.91	196.87	210.25	226.35

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.22	39.41	43.68	42.19	44.31	44.31	49.68	16.27	13.89	45.72	9.58	10.12
Movement LOS	D	D	D	D	D	D	D	B	B	D	A	B
d_A, Approach Delay [s/veh]	41.20			43.51			16.08			13.42		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	17.74											
Intersection LOS	B											
Intersection V/C	0.656											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.486	1.990	0.000	3.119
Crosswalk LOS	B	A	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	133	622	889
d_b, Bicycle Delay [s]	25.69	39.20	21.36	13.89
l_b,int, Bicycle LOS Score for Intersection	2.178	1.716	2.758	2.530
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 7: S. Associated Road at Brea Plaza Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Base Volume Input [veh/h]	0	418	577	11	0	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	418	577	11	0	8
Peak Hour Factor	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	110	152	3	0	2
Total Analysis Volume [veh/h]	0	440	607	12	0	8
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.31
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.04
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.88
d_A, Approach Delay [s/veh]	0.00		0.00		10.31	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Control Type:	Two-way stop	Delay (sec / veh):	17.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Base Volume Input [veh/h]	11	409	575	10	9	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	409	575	10	9	20
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	108	151	3	2	5
Total Analysis Volume [veh/h]	12	431	605	11	9	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.03	0.03
d_M, Delay for Movement [s/veh]	8.80	0.00	0.00	0.00	17.55	10.40
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.04	0.00	0.00	0.00	0.09	0.09
95th-Percentile Queue Length [ft/ln]	0.95	0.00	0.00	0.00	2.35	2.36
d_A, Approach Delay [s/veh]	0.24		0.00		12.54	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.44					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 9: Brea Plaza Dwy 4 at Imperial Highway

Control Type:	Two-way stop	Delay (sec / veh):	21.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.039

Intersection Setup

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Base Volume Input [veh/h]	0	9	0	1995	1775	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	9	0	1995	1775	9
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	0	525	467	2
Total Analysis Volume [veh/h]	0	9	0	2100	1868	9
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	21.44	0.00	0.00	0.00	0.00
Movement LOS		C		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.12	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	3.07	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	21.44		0.00		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.05					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	15.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.657

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	632	0	502	0	1567	862	0	2079	375
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	632	0	502	0	1567	862	0	2079	375
Peak Hour Factor	1.0000	1.0000	1.0000	0.9390	1.0000	0.9390	1.0000	0.9540	0.9540	1.0000	0.9730	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	168	0	134	0	411	226	0	534	96
Total Analysis Volume [veh/h]	0	0	0	673	0	535	0	1643	904	0	2137	385
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing m		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	0	6	0	0	6	0
Maximum Green [s]	0	0	0	30	0	0	0	30	0	0	30	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	64	0	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall				No				No			No	
Maximum Recall				No				No			No	
Pedestrian Recall				No				No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	C	R	C	C
C, Cycle Length [s]		90	90	90	90	90
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		24	24	24	58	58
g / C, Green / Cycle		0.27	0.27	0.27	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate		0.22	0.22	0.21	0.29	0.37
s, saturation flow rate [veh/h]		1800	1800	1900	5700	5700
c, Capacity [veh/h]		487	487	514	3652	3652
d1, Uniform Delay [s]		30.81	30.81	30.35	8.15	9.28
k, delay calibration		0.11	0.11	0.11	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.66	3.66	2.68	0.40	0.69
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.83	0.83	0.78	0.45	0.59
d, Delay for Lane Group [s/veh]		34.47	34.47	33.02	8.55	9.97
Lane Group LOS		C	C	C	A	A
Critical Lane Group		Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.44	8.44	8.21	4.83	7.19
50th-Percentile Queue Length [ft/ln]		211.12	211.12	205.32	120.81	179.74
95th-Percentile Queue Length [veh/ln]		13.21	13.21	12.91	8.44	11.59
95th-Percentile Queue Length [ft/ln]		330.27	330.27	322.82	210.94	289.68

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	34.47	0.00	33.38	0.00	8.55	0.00	0.00	9.97	0.00
Movement LOS				C		C		A			A	
d_A, Approach Delay [s/veh]	0.00			33.99			8.55			9.97		
Approach LOS	A			C			A			A		
d_I, Intersection Delay [s/veh]	15.32											
Intersection LOS	B											
Intersection V/C	0.657											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.425	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1333	489	489
d_b, Bicycle Delay [s]	45.00	5.00	25.69	25.69
l_b,int, Bicycle LOS Score for Intersection	4.132	3.553	2.463	2.735
Bicycle LOS	D	D	B	B

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.709

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	848	72	397	0	0	231	206	1670	345	0	2186	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	848	72	397	0	0	231	206	1670	345	0	2186	46
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	0.8840	0.9510	0.9510	0.9510	1.0000	0.9830	0.9830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	223	19	105	0	0	65	54	439	91	0	556	12
Total Analysis Volume [veh/h]	894	76	418	0	0	261	217	1756	363	0	2224	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	6	6	6	0	0	6	0
Maximum Green [s]	0	30	0	0	0	30	30	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	26	0	0	0	24	24	54	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	22	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No		No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No	No	No			No	
Maximum Recall		No				No	No	No			No	
Pedestrian Recall		No				No	No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	R	L	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22	13	13	56	39	39
g / C, Green / Cycle	0.24	0.24	0.24	0.15	0.15	0.62	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.20	0.20	0.19	0.07	0.12	0.31	0.30	0.30
s, saturation flow rate [veh/h]	3500	1800	1900	3800	1800	5700	5700	1900
c, Capacity [veh/h]	844	434	458	565	268	3559	2459	820
d1, Uniform Delay [s]	32.26	32.27	31.86	35.09	37.16	9.19	20.79	20.79
k, delay calibration	0.11	0.15	0.13	0.11	0.11	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.92	4.98	3.17	0.59	5.84	0.49	1.63	4.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.81	0.77	0.46	0.81	0.49	0.69	0.69
d, Delay for Lane Group [s/veh]	34.18	37.25	35.03	35.68	43.01	9.69	22.42	25.57
Lane Group LOS	C	D	D	D	D	A	C	C
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.06	7.64	7.36	2.63	4.98	5.68	9.55	10.27
50th-Percentile Queue Length [ft/ln]	176.51	191.05	183.91	65.74	124.58	141.93	238.74	256.68
95th-Percentile Queue Length [veh/ln]	11.42	12.18	11.80	4.73	8.64	9.58	14.62	15.52
95th-Percentile Queue Length [ft/ln]	285.45	304.39	295.11	118.33	216.10	239.62	365.44	388.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.88	37.25	35.41	0.00	0.00	35.68	43.01	9.69	0.00	0.00	23.16	25.57
Movement LOS	C	D	D			D	D	A			C	C
d_A, Approach Delay [s/veh]	35.18			35.68			13.35			23.21		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	23.28											
Intersection LOS	C											
Intersection V/C	0.709											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.570	2.277	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	444	1111	578
d_b, Bicycle Delay [s]	25.69	27.22	8.89	22.76
l_b,int, Bicycle LOS Score for Intersection	3.850	1.560	2.645	2.496
Bicycle LOS	D	A	B	B

Sequence

Ring 1	-	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	27.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.666

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	447	31	333	10	19	6	12	828	278	275	1176	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	447	31	333	10	19	6	12	828	278	275	1176	16
Peak Hour Factor	0.9370	0.9370	0.9370	0.8500	0.8500	0.8500	0.9910	0.9910	0.9910	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	119	8	89	3	6	2	3	209	70	73	312	4
Total Analysis Volume [veh/h]	477	33	355	12	22	7	12	836	281	292	1248	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	28	65	0	0	37	0	10	38	0	17	45	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	27	27	4	4	2	69	69	12	79	79
g / C, Green / Cycle	0.16	0.23	0.23	0.04	0.04	0.02	0.57	0.57	0.10	0.66	0.66
(v / s)_i Volume / Saturation Flow Rate	0.14	0.02	0.19	0.01	0.02	0.01	0.31	0.28	0.08	0.33	0.33
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	1900	1900	3500	1900	1900
c, Capacity [veh/h]	549	433	433	76	72	31	1088	1088	349	1245	1245
d1, Uniform Delay [s]	49.40	36.42	44.01	55.95	56.44	58.39	15.83	15.27	53.06	10.70	10.68
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.38	0.07	3.91	0.94	3.65	8.01	1.89	1.59	5.29	1.49	1.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.08	0.82	0.16	0.40	0.39	0.54	0.49	0.84	0.51	0.51
d, Delay for Lane Group [s/veh]	53.79	36.49	47.92	56.89	60.08	66.40	17.72	16.85	58.36	12.19	12.16
Lane Group LOS	D	D	D	E	E	E	B	B	E	B	B
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.30	0.78	10.45	0.37	0.93	0.43	10.12	8.92	4.58	8.68	8.64
50th-Percentile Queue Length [ft/ln]	182.52	19.42	261.35	9.32	23.31	10.73	252.88	223.05	114.46	216.96	215.96
95th-Percentile Queue Length [veh/ln]	11.73	1.40	15.76	0.67	1.68	0.77	15.33	13.82	8.09	13.51	13.46
95th-Percentile Queue Length [ft/ln]	293.30	34.96	393.91	16.78	41.97	19.31	383.28	345.52	202.19	337.75	336.46

Movement, Approach, & Intersection Results

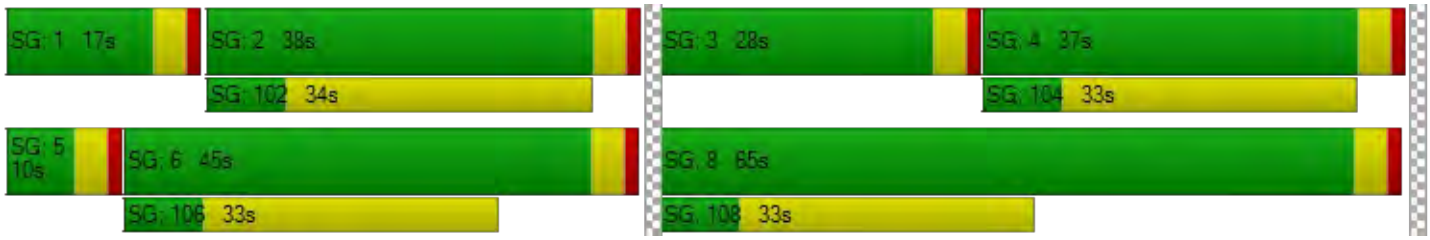
d_M, Delay for Movement [s/veh]	53.79	36.49	47.92	56.89	60.08	60.08	66.40	17.46	16.85	58.36	12.18	12.16
Movement LOS	D	D	D	E	E	E	E	B	B	E	B	B
d_A, Approach Delay [s/veh]	50.72			59.15			17.83			20.84		
Approach LOS	D			E			B			C		
d_I, Intersection Delay [s/veh]	27.52											
Intersection LOS	C											
Intersection V/C	0.666											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	2.704	1.987	2.872	2.932
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1017	550	567	683
d_b, Bicycle Delay [s]	14.50	31.54	30.82	26.00
l_b,int, Bicycle LOS Score for Intersection	2.987	1.627	2.491	2.844
Bicycle LOS	C	A	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: S.Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	6.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.219

Intersection Setup

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Base Volume Input [veh/h]	37	511	35	16	533	8	18	9	42	24	4	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	511	35	16	533	8	18	9	42	24	4	34
Peak Hour Factor	0.9310	0.9310	0.9310	0.9120	0.9120	0.9120	0.8960	0.8960	0.8960	0.8090	0.8090	0.8090
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	137	9	4	146	2	5	3	12	7	1	11
Total Analysis Volume [veh/h]	40	549	38	18	584	9	20	10	47	30	5	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	54	0	0	54	0	0	36	0	0	36	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	77	77	77	77	77	77	5	5
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.85	0.85	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.02	0.16	0.15	0.01	0.16	0.16	0.04	0.04
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1900	1800	1800
c, Capacity [veh/h]	1511	1621	1621	1511	1621	1621	155	160
d1, Uniform Delay [s]	0.99	1.15	1.15	0.98	1.15	1.15	41.68	41.68
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.25	0.24	0.01	0.25	0.25	2.46	2.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.03	0.18	0.18	0.01	0.18	0.18	0.50	0.48
d, Delay for Lane Group [s/veh]	1.02	1.40	1.39	0.99	1.40	1.40	44.14	43.92
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.05	0.38	0.37	0.02	0.38	0.38	1.77	1.76
50th-Percentile Queue Length [ft/ln]	1.13	9.59	9.36	0.50	9.61	9.56	44.21	44.05
95th-Percentile Queue Length [veh/ln]	0.08	0.69	0.67	0.04	0.69	0.69	3.18	3.17
95th-Percentile Queue Length [ft/ln]	2.04	17.25	16.85	0.90	17.31	17.21	79.58	79.29

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.02	1.39	1.39	0.99	1.40	1.40	44.14	44.14	44.14	43.92	43.92	43.92
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.37			1.39			44.14			43.92		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.10											
Intersection LOS	A											
Intersection V/C	0.219											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.593	2.566	1.835	1.810
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1111	1111	711	711
d_b, Bicycle Delay [s]	8.89	8.89	18.69	18.69
l_b,int, Bicycle LOS Score for Intersection	2.077	2.064	1.687	1.687
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	39.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.829

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	205	247	80	278	333	212	240	1697	132	167	1597	163
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	205	247	80	278	333	212	240	1697	132	167	1597	163
Peak Hour Factor	0.9100	0.9100	0.9100	0.8290	0.8290	0.8290	0.9480	0.9480	0.9480	0.9350	0.9350	0.9350
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	68	22	84	100	64	63	448	35	45	427	44
Total Analysis Volume [veh/h]	225	271	88	335	402	256	253	1790	139	179	1708	174
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	39	0	17	43	0	23	47	0	17	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	29	0	0	26	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	24	24	13	28	28	19	54	54	13	48	48
g / C, Green / Cycle	0.08	0.20	0.20	0.11	0.23	0.23	0.16	0.45	0.45	0.11	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.06	0.10	0.09	0.10	0.21	0.13	0.14	0.34	0.34	0.10	0.25	0.25
s, saturation flow rate [veh/h]	3500	1900	1900	3500	1900	1900	1800	3800	1900	1800	5700	1900
c, Capacity [veh/h]	265	382	382	381	445	445	280	1702	851	196	2287	762
d1, Uniform Delay [s]	54.82	42.47	42.14	52.72	44.64	40.67	49.82	27.56	27.86	52.94	28.52	28.85
k, delay calibration	0.11	0.11	0.11	0.11	0.20	0.11	0.13	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.48	0.96	0.84	6.64	12.01	1.17	12.24	3.09	6.53	15.13	1.23	3.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.85	0.49	0.45	0.88	0.90	0.57	0.90	0.75	0.77	0.91	0.61	0.63
d, Delay for Lane Group [s/veh]	62.30	43.43	42.98	59.36	56.64	41.85	62.06	30.65	34.39	68.07	29.75	32.84
Lane Group LOS	E	D	D	E	E	D	E	C	C	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.64	5.00	4.61	5.32	13.03	6.85	8.39	15.64	16.94	6.16	10.80	11.89
50th-Percentile Queue Length [ft/ln]	90.88	125.01	115.24	133.06	325.78	171.13	209.84	390.97	423.44	153.95	270.12	297.32
95th-Percentile Queue Length [veh/ln]	6.54	8.67	8.13	9.11	18.95	11.14	13.15	22.12	23.69	10.23	16.20	17.55
95th-Percentile Queue Length [ft/ln]	163.58	216.69	203.26	227.64	473.79	278.40	328.63	553.11	592.18	255.69	404.89	438.71

Movement, Approach, & Intersection Results

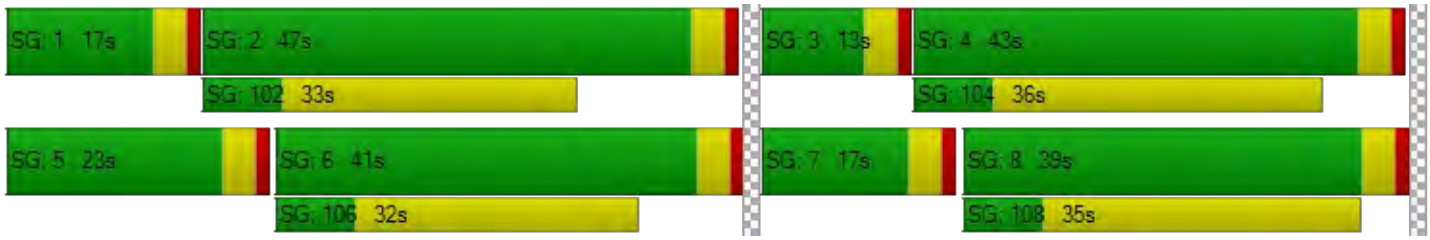
d_M, Delay for Movement [s/veh]	62.30	43.29	42.98	59.36	56.64	41.85	62.06	31.72	34.39	68.07	30.31	32.84
Movement LOS	E	D	D	E	E	D	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	50.57			53.74			35.41			33.80		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	39.49											
Intersection LOS	D											
Intersection V/C	0.829											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	2.679	2.741	3.272	3.260
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	650	717	617
d_b, Bicycle Delay [s]	30.10	27.34	24.70	28.70
l_b,int, Bicycle LOS Score for Intersection	2.041	3.198	2.760	2.410
Bicycle LOS	B	C	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	23.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.764

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	224	45	253	24	22	13	18	1713	263	219	1764	54
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	224	45	253	24	22	13	18	1713	263	219	1764	54
Peak Hour Factor	0.8580	0.8580	0.8580	0.6480	0.6480	0.6480	0.9520	0.9520	0.9520	0.9460	0.9460	0.9460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	13	74	9	8	5	5	450	69	58	466	14
Total Analysis Volume [veh/h]	261	52	295	37	34	20	19	1799	276	232	1865	57
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	26	0	0	10	0	10	32	0	22	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	5	5	2	38	38	14	50	50
g / C, Green / Cycle	0.18	0.18	0.18	0.06	0.06	0.03	0.43	0.43	0.15	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.08	0.09	0.16	0.02	0.03	0.01	0.32	0.15	0.13	0.33	0.35
s, saturation flow rate [veh/h]	1800	1800	1900	1800	1900	1800	5700	1900	1800	3800	1900
c, Capacity [veh/h]	331	331	349	110	116	48	2431	810	272	2094	1047
d1, Uniform Delay [s]	32.79	33.00	35.56	40.59	40.92	43.18	21.67	17.35	37.28	13.62	13.88
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.98	1.12	5.60	1.79	2.90	5.23	2.07	1.14	7.39	1.30	2.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.46	0.49	0.84	0.34	0.47	0.40	0.74	0.34	0.85	0.60	0.63
d, Delay for Lane Group [s/veh]	33.77	34.12	41.16	42.39	43.82	48.40	23.74	18.50	44.67	14.92	16.73
Lane Group LOS	C	C	D	D	D	D	C	B	D	B	B
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.98	3.22	6.67	0.83	1.24	0.48	10.50	3.95	5.45	8.27	9.18
50th-Percentile Queue Length [ft/ln]	74.60	80.55	166.69	20.85	30.99	12.06	262.42	98.85	136.28	206.86	229.57
95th-Percentile Queue Length [veh/ln]	5.37	5.80	10.90	1.50	2.23	0.87	15.81	7.12	9.28	12.99	14.15
95th-Percentile Queue Length [ft/ln]	134.27	144.99	272.56	37.53	55.79	21.70	395.26	177.92	232.00	324.80	353.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.92	34.12	41.16	42.39	43.82	43.82	48.40	23.74	18.50	44.67	15.50	16.73
Movement LOS	C	C	D	D	D	D	D	C	B	D	B	B
d_A, Approach Delay [s/veh]	37.45			43.24			23.28			18.68		
Approach LOS	D			D			C			B		
d_I, Intersection Delay [s/veh]	23.38											
Intersection LOS	C											
Intersection V/C	0.764											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.524	2.011	0.000	3.190
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	133	622	889
d_b, Bicycle Delay [s]	25.69	39.20	21.36	13.89
l_b,int, Bicycle LOS Score for Intersection	2.563	1.710	2.711	2.744
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 7: S. Associated Road at Brea Plaza Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	11.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.067

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Base Volume Input [veh/h]	0	675	691	9	0	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	675	691	9	0	40
Peak Hour Factor	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	178	182	2	0	11
Total Analysis Volume [veh/h]	0	711	727	9	0	42
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.07
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.13
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.21
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	5.35
d_A, Approach Delay [s/veh]	0.00		0.00		11.13	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.31					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Control Type:	Two-way stop	Delay (sec / veh):	28.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.213

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Base Volume Input [veh/h]	15	635	699	32	40	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	635	699	32	40	124
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	167	184	8	11	33
Total Analysis Volume [veh/h]	16	668	736	34	42	131
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.01	0.00	0.21	0.21
d_M, Delay for Movement [s/veh]	9.37	0.00	0.00	0.00	28.18	12.46
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	0.06	0.00	0.00	0.00	0.78	0.80
95th-Percentile Queue Length [ft/ln]	1.46	0.00	0.00	0.00	19.55	20.10
d_A, Approach Delay [s/veh]	0.22		0.00		16.27	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.82					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 9: Brea Plaza Dwy 4 at Imperial Highway

Control Type:	Two-way stop	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.270

Intersection Setup

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Base Volume Input [veh/h]	0	48	0	2069	1979	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	48	0	2069	1979	35
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	13	0	544	521	9
Total Analysis Volume [veh/h]	0	51	0	2178	2083	37
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.27	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	30.92	0.00	0.00	0.00	0.00
Movement LOS		D		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.04	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	26.11	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	30.92		0.00		0.00	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	0.36					
Intersection LOS	D					

APPENDIX D-II

YEAR 2024 CUMULATIVE TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.642

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	577	0	501	0	1479	796	0	1921	180
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	577	0	501	0	1479	796	0	1921	180
Peak Hour Factor	1.0000	1.0000	1.0000	0.8810	1.0000	0.8810	1.0000	0.9270	0.9270	1.0000	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	164	0	142	0	399	215	0	511	48
Total Analysis Volume [veh/h]	0	0	0	655	0	569	0	1595	859	0	2044	191
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing m		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	0	6	0	0	6	0
Maximum Green [s]	0	0	0	30	0	0	0	30	0	0	30	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	64	0	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall				No				No			No	
Maximum Recall				No				No			No	
Pedestrian Recall				No				No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	C	R	C	C
C, Cycle Length [s]		90	90	90	90	90
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		25	25	25	57	57
g / C, Green / Cycle		0.27	0.27	0.27	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate		0.23	0.23	0.21	0.28	0.36
s, saturation flow rate [veh/h]		1800	1800	1900	5700	5700
c, Capacity [veh/h]		493	493	520	3632	3632
d1, Uniform Delay [s]		30.63	30.63	30.17	8.21	9.22
k, delay calibration		0.11	0.11	0.11	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.63	3.63	2.65	0.39	0.64
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.83	0.83	0.78	0.44	0.56
d, Delay for Lane Group [s/veh]		34.26	34.26	32.82	8.60	9.85
Lane Group LOS		C	C	C	A	A
Critical Lane Group		Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.54	8.54	8.30	4.70	6.79
50th-Percentile Queue Length [ft/ln]		213.44	213.44	207.53	117.49	169.72
95th-Percentile Queue Length [veh/ln]		13.33	13.33	13.03	8.25	11.06
95th-Percentile Queue Length [ft/ln]		333.24	333.24	325.66	206.37	276.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	34.26	0.00	33.23	0.00	8.60	0.00	0.00	9.85	0.00
Movement LOS				C		C		A			A	
d_A, Approach Delay [s/veh]	0.00			33.78			8.60			9.85		
Approach LOS	A			C			A			A		
d_I, Intersection Delay [s/veh]	15.46											
Intersection LOS	B											
Intersection V/C	0.642											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.429	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1333	489	489
d_b, Bicycle Delay [s]	45.00	5.00	25.69	25.69
l_b,int, Bicycle LOS Score for Intersection	4.132	3.579	2.437	2.684
Bicycle LOS	D	D	B	B

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	25.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.670

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1037	44	784	0	0	53	121	1333	548	0	1474	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1037	44	784	0	0	53	121	1333	548	0	1474	19
Peak Hour Factor	0.9080	0.9080	0.9080	1.0000	1.0000	0.6820	0.8790	0.8790	0.8790	1.0000	0.8940	0.8940
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	286	12	216	0	0	19	34	379	156	0	412	5
Total Analysis Volume [veh/h]	1142	48	863	0	0	78	138	1516	623	0	1649	21
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	6	6	6	0	0	6	0
Maximum Green [s]	0	30	0	0	0	30	30	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	42	0	0	0	13	13	43	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	22	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No		No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No	No	No			No	
Maximum Recall		No				No	No	No			No	
Pedestrian Recall		No				No	No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	R	L	C	C	C
C, Cycle Length [s]	95	95	95	95	95	95	95	95
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	34	34	34	9	9	49	36	36
g / C, Green / Cycle	0.36	0.36	0.36	0.09	0.09	0.52	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.29	0.29	0.27	0.02	0.08	0.27	0.22	0.22
s, saturation flow rate [veh/h]	3500	1800	1900	3800	1800	5700	5700	1900
c, Capacity [veh/h]	1243	639	675	360	171	2950	2170	723
d1, Uniform Delay [s]	27.83	27.84	27.26	39.80	42.22	15.09	23.39	23.39
k, delay calibration	0.11	0.19	0.16	0.11	0.11	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.35	4.41	2.86	0.30	8.75	0.64	1.13	3.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.81	0.77	0.22	0.81	0.51	0.58	0.58
d, Delay for Lane Group [s/veh]	29.17	32.26	30.12	40.10	50.97	15.73	24.51	26.73
Lane Group LOS	C	C	C	D	D	B	C	C
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	10.29	11.15	10.68	0.85	3.56	6.95	7.42	7.87
50th-Percentile Queue Length [ft/ln]	257.31	278.75	267.12	21.31	88.97	173.87	185.56	196.68
95th-Percentile Queue Length [veh/ln]	15.55	16.63	16.05	1.53	6.41	11.28	11.89	12.47
95th-Percentile Queue Length [ft/ln]	388.85	415.65	401.14	38.36	160.14	282.00	297.27	311.68

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.49	32.26	30.99	0.00	0.00	40.10	50.97	15.73	0.00	0.00	25.04	26.73
Movement LOS	C	C	C			D	D	B			C	C
d_A, Approach Delay [s/veh]	30.20			40.10			18.67			25.07		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	25.27											
Intersection LOS	C											
Intersection V/C	0.670											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	37.14	37.14	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.702	2.203	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	189	821	547
d_b, Bicycle Delay [s]	17.10	38.93	16.51	25.06
l_b,int, Bicycle LOS Score for Intersection	4.947	1.560	2.469	2.248
Bicycle LOS	E	A	B	B

Sequence

Ring 1	-	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	28.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.817

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	235	6	307	55	29	8	2	937	303	342	763	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	235	6	307	55	29	8	2	937	303	342	763	10
Peak Hour Factor	0.8160	0.8160	0.8160	0.7410	0.7410	0.7410	0.8560	0.8560	0.8560	0.9140	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	72	2	94	19	10	3	1	274	88	94	209	3
Total Analysis Volume [veh/h]	288	7	376	74	39	11	2	1095	354	374	835	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	54	0	0	37	0	10	38	0	18	46	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	24	24	9	9	0	60	60	14	73	73
g / C, Green / Cycle	0.10	0.22	0.22	0.08	0.08	0.00	0.55	0.55	0.12	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.08	0.00	0.20	0.04	0.03	0.00	0.39	0.37	0.11	0.22	0.22
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	1900	1900	3500	1900	1900
c, Capacity [veh/h]	354	420	420	181	159	8	1037	1037	435	1264	1264
d1, Uniform Delay [s]	48.46	33.51	41.63	48.21	47.47	54.64	18.76	18.02	47.27	7.93	7.92
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.53	0.02	6.86	1.48	1.12	16.65	4.36	3.54	5.08	0.72	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.02	0.89	0.41	0.31	0.26	0.72	0.68	0.86	0.34	0.33
d, Delay for Lane Group [s/veh]	52.99	33.53	48.49	49.69	48.59	71.29	23.11	21.55	52.35	8.64	8.63
Lane Group LOS	D	C	D	D	D	E	C	C	D	A	A
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.08	0.15	10.61	2.01	1.34	0.09	14.82	13.22	5.31	4.24	4.22
50th-Percentile Queue Length [ft/ln]	102.08	3.72	265.37	50.34	33.50	2.28	370.41	330.51	132.75	106.07	105.48
95th-Percentile Queue Length [veh/ln]	7.35	0.27	15.96	3.62	2.41	0.16	21.13	19.18	9.09	7.62	7.59
95th-Percentile Queue Length [ft/ln]	183.74	6.70	398.95	90.62	60.29	4.10	528.23	479.59	227.23	190.52	189.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.99	33.53	48.49	49.69	48.59	48.59	71.29	22.62	21.55	52.35	8.64	8.63
Movement LOS	D	C	D	D	D	D	E	C	C	D	A	A
d_A, Approach Delay [s/veh]	50.26			49.25			22.43			22.04		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	28.64											
Intersection LOS	C											
Intersection V/C	0.817											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
l_p,int, Pedestrian LOS Score for Intersection	2.696	1.997	2.813	3.017
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	909	600	618	764
d_b, Bicycle Delay [s]	16.36	26.95	26.25	21.02
l_b,int, Bicycle LOS Score for Intersection	2.667	1.764	2.757	2.566
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: S.Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	8.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.236

Intersection Setup

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Base Volume Input [veh/h]	39	392	15	19	460	13	6	1	32	42	8	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	392	15	19	460	13	6	1	32	42	8	40
Peak Hour Factor	0.8160	0.8160	0.8160	0.9430	0.9430	0.9430	0.6670	0.6670	0.6670	0.6100	0.6100	0.6100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	120	5	5	122	3	2	0	12	17	3	16
Total Analysis Volume [veh/h]	48	480	18	20	488	14	9	1	48	69	13	66
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	73	73	73	73	73	73	9	9
g / C, Green / Cycle	0.81	0.81	0.81	0.81	0.81	0.81	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.03	0.13	0.13	0.01	0.13	0.13	0.03	0.08
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1900	1800	1800
c, Capacity [veh/h]	1416	1534	1534	1416	1534	1534	232	245
d1, Uniform Delay [s]	1.71	1.92	1.91	1.68	1.92	1.92	37.31	39.34
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.04	0.23	0.23	0.02	0.23	0.23	0.56	2.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.03	0.16	0.16	0.01	0.16	0.16	0.25	0.60
d, Delay for Lane Group [s/veh]	1.75	2.14	2.14	1.70	2.15	2.14	37.86	41.73
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.11	0.65	0.64	0.05	0.65	0.65	1.21	3.31
50th-Percentile Queue Length [ft/ln]	2.80	16.25	16.05	1.15	16.37	16.23	30.13	82.74
95th-Percentile Queue Length [veh/ln]	0.20	1.17	1.16	0.08	1.18	1.17	2.17	5.96
95th-Percentile Queue Length [ft/ln]	5.04	29.24	28.90	2.07	29.47	29.21	54.24	148.93

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.75	2.14	2.14	1.70	2.15	2.14	37.86	37.86	37.86	41.73	41.73	41.73
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.11			2.13			37.86			41.73		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	8.35											
Intersection LOS	A											
Intersection V/C	0.236											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.622	2.522	1.847	1.834
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	444	444	1378	1378
d_b, Bicycle Delay [s]	27.22	27.22	4.36	4.36
l_b,int, Bicycle LOS Score for Intersection	2.010	1.990	1.655	1.804
Bicycle LOS	B	A	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	28.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.782

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	148	204	70	146	323	146	147	1859	101	91	1621	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	148	204	70	146	323	146	147	1859	101	91	1621	82
Peak Hour Factor	0.8870	0.8870	0.8870	0.9320	0.9320	0.9320	0.9120	0.9120	0.9120	0.9620	0.9620	0.9620
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	57	20	39	87	39	40	510	28	24	421	21
Total Analysis Volume [veh/h]	167	230	79	157	347	157	161	2038	111	95	1685	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	39	0	12	41	0	16	48	0	11	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	29	0	0	26	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	22	22	7	23	23	12	58	58	7	54	54
g / C, Green / Cycle	0.05	0.20	0.20	0.06	0.21	0.21	0.11	0.53	0.53	0.06	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.05	0.08	0.08	0.04	0.18	0.08	0.09	0.37	0.39	0.05	0.23	0.24
s, saturation flow rate [veh/h]	3500	1900	1900	3500	1900	1900	1800	3800	1900	1800	5700	1900
c, Capacity [veh/h]	194	377	377	220	392	392	191	2009	1005	116	2776	925
d1, Uniform Delay [s]	51.59	38.59	38.36	50.61	42.43	37.81	48.31	19.50	19.88	50.87	18.79	19.17
k, delay calibration	0.11	0.11	0.11	0.11	0.12	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.70	0.75	0.67	4.25	7.57	0.66	9.63	2.11	4.63	13.12	0.57	1.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.86	0.42	0.40	0.71	0.89	0.40	0.84	0.71	0.73	0.82	0.47	0.50
d, Delay for Lane Group [s/veh]	62.29	39.34	39.04	54.86	50.00	38.47	57.94	21.62	24.51	64.00	19.37	21.12
Lane Group LOS	E	D	D	D	D	D	E	C	C	E	B	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.57	3.85	3.57	2.25	9.90	3.73	4.83	13.58	14.97	3.00	7.36	8.35
50th-Percentile Queue Length [ft/ln]	64.21	96.17	89.37	56.21	247.59	93.31	120.86	339.60	374.13	75.07	183.94	208.69
95th-Percentile Queue Length [veh/ln]	4.62	6.92	6.43	4.05	15.06	6.72	8.44	19.63	21.31	5.41	11.81	13.09
95th-Percentile Queue Length [ft/ln]	115.57	173.11	160.86	101.17	376.61	167.95	211.00	490.71	532.73	135.13	295.15	327.15

Movement, Approach, & Intersection Results

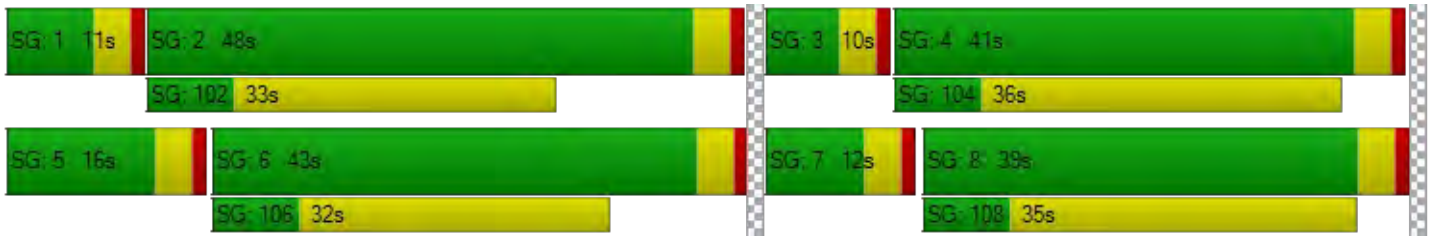
d_M, Delay for Movement [s/veh]	62.29	39.25	39.04	54.86	50.00	38.47	57.94	22.50	24.51	64.00	19.76	21.12
Movement LOS	E	D	D	D	D	D	E	C	C	E	B	C
d_A, Approach Delay [s/veh]	47.30			48.42			25.06			22.08		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	28.91											
Intersection LOS	C											
Intersection V/C	0.782											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
l_p,int, Pedestrian LOS Score for Intersection	2.630	2.647	3.261	3.239
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	636	673	800	709
d_b, Bicycle Delay [s]	25.57	24.22	19.80	22.91
l_b,int, Bicycle LOS Score for Intersection	1.952	2.650	2.830	2.329
Bicycle LOS	A	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	18.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.686

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	179	11	142	25	28	13	12	1814	358	172	1478	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	179	11	142	25	28	13	12	1814	358	172	1478	32
Peak Hour Factor	0.8320	0.8320	0.8320	0.6740	0.6740	0.6740	0.9510	0.9510	0.9510	0.8930	0.8930	0.8930
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	3	43	9	10	5	3	477	94	48	414	9
Total Analysis Volume [veh/h]	215	13	171	37	42	19	13	1907	376	193	1655	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	26	0	0	10	0	10	32	0	22	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	11	11	6	6	2	46	46	12	56	56
g / C, Green / Cycle	0.12	0.12	0.12	0.06	0.06	0.02	0.51	0.51	0.13	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.06	0.07	0.09	0.02	0.03	0.01	0.33	0.20	0.11	0.29	0.30
s, saturation flow rate [veh/h]	1800	1800	1900	1800	1900	1800	5700	1900	1800	3800	1900
c, Capacity [veh/h]	215	215	227	112	118	36	2916	972	233	2361	1181
d1, Uniform Delay [s]	37.26	37.41	38.43	40.50	40.98	43.63	16.16	13.41	38.26	9.14	9.29
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.91	2.16	5.04	1.72	3.48	6.05	1.16	1.16	7.29	0.68	1.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.55	0.75	0.33	0.52	0.36	0.65	0.39	0.83	0.47	0.49
d, Delay for Lane Group [s/veh]	39.17	39.58	43.48	42.22	44.47	49.68	17.32	14.57	45.56	9.82	10.75
Lane Group LOS	D	D	D	D	D	D	B	B	D	A	B
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.37	2.54	3.92	0.83	1.41	0.34	9.20	4.68	4.56	5.38	5.93
50th-Percentile Queue Length [ft/ln]	59.32	63.38	97.97	20.79	35.31	8.60	230.03	116.90	114.03	134.49	148.28
95th-Percentile Queue Length [veh/ln]	4.27	4.56	7.05	1.50	2.54	0.62	14.18	8.22	8.06	9.18	9.93
95th-Percentile Queue Length [ft/ln]	106.77	114.08	176.34	37.42	63.56	15.47	354.40	205.55	201.59	229.58	248.13

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.37	39.58	43.48	42.22	44.47	44.47	49.68	17.32	14.57	45.56	10.12	10.75
Movement LOS	D	D	D	D	D	D	D	B	B	D	B	B
d_A, Approach Delay [s/veh]	41.14			43.62			17.05			13.77		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	18.34											
Intersection LOS	B											
Intersection V/C	0.686											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.496	1.992	0.000	3.150
Crosswalk LOS	B	A	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	133	622	889
d_b, Bicycle Delay [s]	25.69	39.20	21.36	13.89
l_b,int, Bicycle LOS Score for Intersection	2.218	1.721	2.822	2.596
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 7: S. Associated Road at Brea Plaza Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Base Volume Input [veh/h]	0	432	595	11	0	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	432	595	11	0	8
Peak Hour Factor	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	114	157	3	0	2
Total Analysis Volume [veh/h]	0	455	626	12	0	8
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.38
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.04
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.90
d_A, Approach Delay [s/veh]	0.00		0.00		10.38	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Control Type:	Two-way stop	Delay (sec / veh):	18.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Base Volume Input [veh/h]	11	422	593	10	9	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	422	593	10	9	21
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	111	156	3	2	6
Total Analysis Volume [veh/h]	12	444	624	11	9	22
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.03	0.03
d_M, Delay for Movement [s/veh]	8.86	0.00	0.00	0.00	18.05	10.49
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.04	0.00	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.97	0.00	0.00	0.00	2.44	2.51
d_A, Approach Delay [s/veh]	0.23		0.00		12.68	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.45					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 9: Brea Plaza Dwy 4 at Imperial Highway

Control Type:	Two-way stop	Delay (sec / veh):	23.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.044

Intersection Setup

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Base Volume Input [veh/h]	0	9	0	2110	1906	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	9	0	2110	1906	9
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	0	555	502	2
Total Analysis Volume [veh/h]	0	9	0	2221	2006	9
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	23.36	0.00	0.00	0.00	0.00
Movement LOS		C		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.14	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	3.42	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	23.36		0.00		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.05					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	653	0	548	0	1701	1051	0	2442	388
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	653	0	548	0	1701	1051	0	2442	388
Peak Hour Factor	1.0000	1.0000	1.0000	0.9390	1.0000	0.9390	1.0000	0.9540	0.9540	1.0000	0.9730	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	174	0	146	0	446	275	0	627	100
Total Analysis Volume [veh/h]	0	0	0	695	0	584	0	1783	1102	0	2510	399
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing m		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	0	6	0	0	6	0
Maximum Green [s]	0	0	0	30	0	0	0	30	0	0	30	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	64	0	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall				No				No			No	
Maximum Recall				No				No			No	
Pedestrian Recall				No				No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	C	R	C	C
C, Cycle Length [s]		90	90	90	90	90
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		26	26	26	56	56
g / C, Green / Cycle		0.29	0.29	0.29	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate		0.24	0.24	0.22	0.31	0.44
s, saturation flow rate [veh/h]		1800	1800	1900	5700	5700
c, Capacity [veh/h]		513	513	542	3567	3567
d1, Uniform Delay [s]		30.08	30.08	29.60	9.15	11.23
k, delay calibration		0.11	0.11	0.11	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.56	3.56	2.58	0.50	1.19
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.83	0.83	0.79	0.50	0.70
d, Delay for Lane Group [s/veh]		33.64	33.64	32.18	9.65	12.42
Lane Group LOS		C	C	C	A	B
Critical Lane Group		Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.86	8.86	8.61	5.76	10.07
50th-Percentile Queue Length [ft/ln]		221.56	221.56	215.26	144.11	251.73
95th-Percentile Queue Length [veh/ln]		13.74	13.74	13.42	9.70	15.27
95th-Percentile Queue Length [ft/ln]		343.62	343.62	335.56	242.55	381.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	33.64	0.00	32.57	0.00	9.65	0.00	0.00	12.42	0.00
Movement LOS				C		C		A			B	
d_A, Approach Delay [s/veh]	0.00			33.15			9.65			12.42		
Approach LOS	A			C			A			B		
d_I, Intersection Delay [s/veh]	16.29											
Intersection LOS	B											
Intersection V/C	0.743											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.442	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1333	489	489
d_b, Bicycle Delay [s]	45.00	5.00	25.69	25.69
l_b,int, Bicycle LOS Score for Intersection	4.132	3.670	2.540	2.940
Bicycle LOS	D	D	B	C

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.770

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1089	74	409	0	0	239	213	1796	371	0	2340	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1089	74	409	0	0	239	213	1796	371	0	2340	47
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	0.8840	0.9510	0.9510	0.9510	1.0000	0.9830	0.9830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	287	19	108	0	0	68	56	472	98	0	595	12
Total Analysis Volume [veh/h]	1148	78	431	0	0	270	224	1889	390	0	2380	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	6	6	6	0	0	6	0
Maximum Green [s]	0	30	0	0	0	30	30	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	34	0	0	0	26	26	56	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	22	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No		No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No	No	No			No	
Maximum Recall		No				No	No	No			No	
Pedestrian Recall		No				No	No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	R	L	C	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	28	28	28	15	15	60	41	41
g / C, Green / Cycle	0.28	0.28	0.28	0.15	0.15	0.60	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.23	0.23	0.22	0.07	0.12	0.33	0.32	0.32
s, saturation flow rate [veh/h]	3500	1800	1900	3800	1800	5700	5700	1900
c, Capacity [veh/h]	987	508	536	571	270	3403	2319	773
d1, Uniform Delay [s]	33.66	33.67	33.14	38.93	41.30	12.16	25.88	25.88
k, delay calibration	0.11	0.20	0.18	0.11	0.11	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.84	6.36	4.13	0.61	6.43	0.66	2.76	7.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.83	0.78	0.47	0.83	0.56	0.79	0.79
d, Delay for Lane Group [s/veh]	35.50	40.03	37.27	39.54	47.73	12.82	28.64	33.76
Lane Group LOS	D	D	D	D	D	B	C	C
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.33	10.25	9.82	3.06	5.79	8.04	12.72	13.81
50th-Percentile Queue Length [ft/ln]	233.34	256.31	245.57	76.60	144.79	201.03	317.88	345.33
95th-Percentile Queue Length [veh/ln]	14.34	15.50	14.96	5.52	9.74	12.69	18.56	19.91
95th-Percentile Queue Length [ft/ln]	358.60	387.59	374.06	137.88	243.46	317.29	464.08	497.71

Movement, Approach, & Intersection Results

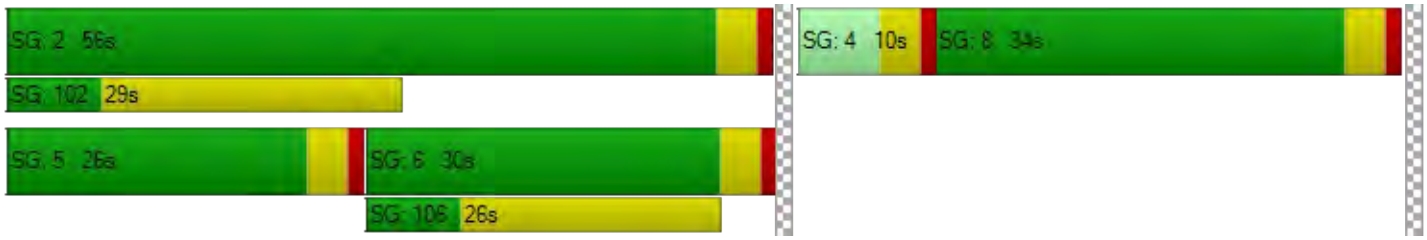
d_M, Delay for Movement [s/veh]	36.79	40.03	37.38	0.00	0.00	39.54	47.73	12.82	0.00	0.00	29.84	33.76
Movement LOS	D	D	D			D	D	B			C	C
d_A, Approach Delay [s/veh]	37.10			39.54			16.52			29.92		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	27.78											
Intersection LOS	C											
Intersection V/C	0.770											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.628	2.287	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	440	1040	520
d_b, Bicycle Delay [s]	24.50	30.42	11.52	27.38
l_b,int, Bicycle LOS Score for Intersection	4.294	1.560	2.722	2.561
Bicycle LOS	E	A	B	B

Sequence

Ring 1	-	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	27.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.691

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	460	32	343	10	20	6	12	874	286	283	1241	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	460	32	343	10	20	6	12	874	286	283	1241	16
Peak Hour Factor	0.9370	0.9370	0.9370	0.8500	0.8500	0.8500	0.9910	0.9910	0.9910	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	123	9	92	3	6	2	3	220	72	75	329	4
Total Analysis Volume [veh/h]	491	34	366	12	24	7	12	882	289	300	1317	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	29	66	0	0	37	0	10	38	0	16	44	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	28	28	5	5	2	68	68	12	78	78
g / C, Green / Cycle	0.16	0.23	0.23	0.04	0.04	0.02	0.57	0.57	0.10	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.14	0.02	0.19	0.01	0.02	0.01	0.32	0.30	0.09	0.35	0.35
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	1900	1900	3500	1900	1900
c, Capacity [veh/h]	564	443	443	77	73	31	1077	1077	351	1235	1235
d1, Uniform Delay [s]	49.11	35.94	43.72	55.85	56.40	58.39	16.60	15.99	53.14	11.34	11.32
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.30	0.07	3.98	0.92	3.85	8.01	2.16	1.80	5.98	1.70	1.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.08	0.83	0.16	0.42	0.39	0.57	0.52	0.85	0.54	0.54
d, Delay for Lane Group [s/veh]	53.41	36.01	47.70	56.78	60.25	66.40	18.76	17.80	59.12	13.04	13.02
Lane Group LOS	D	D	D	E	E	E	B	B	E	B	B
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.50	0.79	10.78	0.37	1.00	0.43	11.02	9.74	4.74	9.61	9.58
50th-Percentile Queue Length [ft/ln]	187.47	19.87	269.42	9.31	24.94	10.73	275.41	243.42	118.50	240.29	239.38
95th-Percentile Queue Length [veh/ln]	11.99	1.43	16.16	0.67	1.80	0.77	16.46	14.85	8.31	14.70	14.65
95th-Percentile Queue Length [ft/ln]	299.75	35.76	404.01	16.75	44.90	19.31	411.49	371.35	207.77	367.41	366.25

Movement, Approach, & Intersection Results

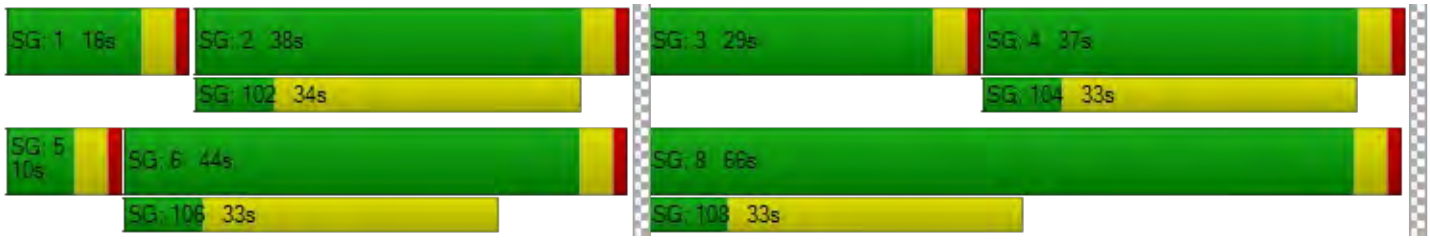
d_M, Delay for Movement [s/veh]	53.41	36.01	47.70	56.78	60.25	60.25	66.40	18.46	17.80	59.12	13.03	13.02
Movement LOS	D	D	D	E	E	E	E	B	B	E	B	B
d_A, Approach Delay [s/veh]	50.40			59.28			18.78			21.49		
Approach LOS	D			E			B			C		
d_I, Intersection Delay [s/veh]	27.94											
Intersection LOS	C											
Intersection V/C	0.691											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	2.711	1.988	2.898	2.954
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1033	550	567	667
d_b, Bicycle Delay [s]	14.02	31.54	30.82	26.67
l_b,int, Bicycle LOS Score for Intersection	3.030	1.631	2.536	2.908
Bicycle LOS	C	A	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: S.Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	6.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.226

Intersection Setup

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Base Volume Input [veh/h]	39	526	37	16	549	8	19	9	45	27	4	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	526	37	16	549	8	19	9	45	27	4	35
Peak Hour Factor	0.9310	0.9310	0.9310	0.9120	0.9120	0.9120	0.8960	0.8960	0.8960	0.8090	0.8090	0.8090
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	141	10	4	150	2	5	3	13	8	1	11
Total Analysis Volume [veh/h]	42	565	40	18	602	9	21	10	50	33	5	43
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	77	77	77	77	77	77	5	5
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.85	0.85	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.02	0.16	0.16	0.01	0.16	0.16	0.05	0.05
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1900	1800	1800
c, Capacity [veh/h]	1502	1617	1617	1502	1617	1617	159	164
d1, Uniform Delay [s]	1.02	1.19	1.19	1.01	1.19	1.19	41.59	41.59
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.26	0.25	0.01	0.26	0.26	2.53	2.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.03	0.19	0.19	0.01	0.19	0.19	0.51	0.49
d, Delay for Lane Group [s/veh]	1.06	1.45	1.44	1.02	1.45	1.45	44.12	43.86
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.05	0.42	0.41	0.02	0.42	0.42	1.86	1.85
50th-Percentile Queue Length [ft/ln]	1.25	10.47	10.22	0.53	10.50	10.44	46.49	46.30
95th-Percentile Queue Length [veh/ln]	0.09	0.75	0.74	0.04	0.76	0.75	3.35	3.33
95th-Percentile Queue Length [ft/ln]	2.25	18.85	18.39	0.95	18.89	18.79	83.69	83.34

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.06	1.44	1.44	1.02	1.45	1.45	44.12	44.12	44.12	43.86	43.86	43.86
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.42			1.44			44.12			43.86		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.22											
Intersection LOS	A											
Intersection V/C	0.226											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.606	2.575	1.841	1.813
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	444	444	1378	1378
d_b, Bicycle Delay [s]	27.22	27.22	4.36	4.36
l_b,int, Bicycle LOS Score for Intersection	2.093	2.079	1.693	1.693
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	40.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.879

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	217	254	82	286	343	223	249	1817	139	172	1721	168
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	217	254	82	286	343	223	249	1817	139	172	1721	168
Peak Hour Factor	0.9100	0.9100	0.9100	0.8290	0.8290	0.8290	0.9480	0.9480	0.9480	0.9350	0.9350	0.9350
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	70	23	86	103	67	66	479	37	46	460	45
Total Analysis Volume [veh/h]	238	279	90	345	414	269	263	1917	147	184	1841	180
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	39	0	17	44	0	22	42	0	17	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	29	0	0	26	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	23	23	13	28	28	18	50	50	13	45	45
g / C, Green / Cycle	0.07	0.20	0.20	0.11	0.24	0.24	0.16	0.44	0.44	0.11	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.07	0.10	0.09	0.10	0.22	0.14	0.15	0.36	0.37	0.10	0.26	0.27
s, saturation flow rate [veh/h]	3500	1900	1900	3500	1900	1900	1800	3800	1900	1800	5700	1900
c, Capacity [veh/h]	246	378	378	397	461	461	282	1652	826	204	2232	744
d1, Uniform Delay [s]	53.37	41.04	40.71	50.16	42.23	38.47	47.91	28.68	29.10	50.36	28.92	29.33
k, delay calibration	0.11	0.11	0.11	0.11	0.19	0.11	0.13	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	19.98	1.05	0.91	5.86	10.51	1.18	14.98	4.86	10.48	13.26	1.64	5.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.97	0.51	0.47	0.87	0.90	0.58	0.93	0.83	0.85	0.90	0.67	0.70
d, Delay for Lane Group [s/veh]	73.35	42.09	41.62	56.03	52.73	39.65	62.89	33.54	39.58	63.63	30.56	34.73
Lane Group LOS	E	D	D	E	D	D	E	C	D	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.11	4.94	4.55	5.19	12.63	6.83	8.59	17.25	19.19	5.97	11.58	12.96
50th-Percentile Queue Length [ft/ln]	102.73	123.56	113.69	129.85	315.86	170.86	214.66	431.15	479.84	149.23	289.40	323.91
95th-Percentile Queue Length [veh/ln]	7.40	8.59	8.05	8.93	18.46	11.12	13.39	24.06	26.38	9.98	17.16	18.86
95th-Percentile Queue Length [ft/ln]	184.91	214.71	201.13	223.30	461.59	278.05	334.80	601.41	659.46	249.40	428.90	471.49

Movement, Approach, & Intersection Results

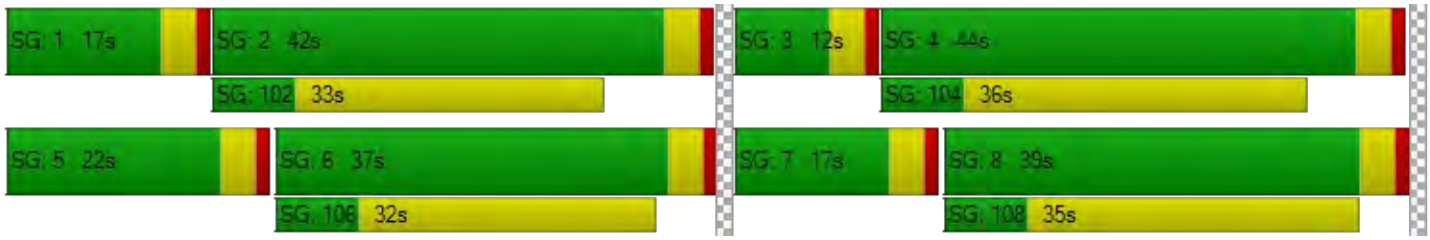
d_M, Delay for Movement [s/veh]	73.35	41.94	41.62	56.03	52.73	39.65	62.89	35.28	39.58	63.63	31.33	34.73
Movement LOS	E	D	D	E	D	D	E	D	D	E	C	C
d_A, Approach Delay [s/veh]	54.21			50.41			38.67			34.31		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	40.60											
Intersection LOS	D											
Intersection V/C	0.879											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.03	47.03	47.03	47.03
l_p,int, Pedestrian LOS Score for Intersection	2.684	2.749	3.307	3.293
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	609	696	661	574
d_b, Bicycle Delay [s]	27.83	24.46	25.78	29.23
l_b,int, Bicycle LOS Score for Intersection	2.060	3.256	2.839	2.469
Bicycle LOS	B	C	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	24.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.800

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	250	46	261	25	23	13	19	1826	281	226	1875	56
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	250	46	261	25	23	13	19	1826	281	226	1875	56
Peak Hour Factor	0.8580	0.8580	0.8580	0.6480	0.6480	0.6480	0.9520	0.9520	0.9520	0.9460	0.9460	0.9460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	13	76	10	9	5	5	480	74	60	496	15
Total Analysis Volume [veh/h]	291	54	304	39	35	20	20	1918	295	239	1982	59
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	26	0	0	10	0	10	32	0	22	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	5	5	2	38	38	14	49	49
g / C, Green / Cycle	0.19	0.19	0.19	0.06	0.06	0.03	0.42	0.42	0.15	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.09	0.10	0.16	0.02	0.03	0.01	0.34	0.16	0.13	0.35	0.37
s, saturation flow rate [veh/h]	1800	1800	1900	1800	1900	1800	5700	1900	1800	3800	1900
c, Capacity [veh/h]	340	340	358	111	117	50	2379	793	279	2070	1035
d1, Uniform Delay [s]	32.71	32.95	35.34	40.60	40.90	43.11	23.07	18.12	37.11	14.45	14.77
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.10	1.26	5.61	1.90	2.93	5.15	3.04	1.34	7.42	1.59	3.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.53	0.85	0.35	0.47	0.40	0.81	0.37	0.86	0.65	0.67
d, Delay for Lane Group [s/veh]	33.81	34.21	40.95	42.50	43.83	48.26	26.11	19.46	44.54	16.03	18.28
Lane Group LOS	C	C	D	D	D	D	C	B	D	B	B
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.30	3.56	6.86	0.88	1.26	0.51	11.92	4.37	5.61	9.27	10.38
50th-Percentile Queue Length [ft/ln]	82.59	89.12	171.51	22.01	31.57	12.63	298.05	109.32	140.30	231.69	259.41
95th-Percentile Queue Length [veh/ln]	5.95	6.42	11.16	1.58	2.27	0.91	17.58	7.80	9.50	14.26	15.66
95th-Percentile Queue Length [ft/ln]	148.65	160.41	278.90	39.61	56.83	22.74	439.62	195.06	237.42	356.50	391.49

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.98	34.21	40.95	42.50	43.83	43.83	48.26	26.11	19.46	44.54	16.76	18.28
Movement LOS	C	C	D	D	D	D	D	C	B	D	B	B
d_A, Approach Delay [s/veh]	37.26			43.28			25.43			19.71		
Approach LOS	D			D			C			B		
d_I, Intersection Delay [s/veh]	24.73											
Intersection LOS	C											
Intersection V/C	0.800											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.537	2.013	0.000	3.226
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	133	622	889
d_b, Bicycle Delay [s]	25.69	39.20	21.36	13.89
l_b,int, Bicycle LOS Score for Intersection	2.630	1.715	2.788	2.814
Bicycle LOS	B	A	C	C

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 7: S. Associated Road at Brea Plaza Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.070

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Base Volume Input [veh/h]	0	696	714	9	0	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	696	714	9	0	41
Peak Hour Factor	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	183	188	2	0	11
Total Analysis Volume [veh/h]	0	733	752	9	0	43
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.07
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.27
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.22
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	5.60
d_A, Approach Delay [s/veh]	0.00		0.00		11.27	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.32					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Control Type:	Two-way stop	Delay (sec / veh):	30.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.230

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Base Volume Input [veh/h]	15	655	722	33	41	128
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	655	722	33	41	128
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	172	190	9	11	34
Total Analysis Volume [veh/h]	16	689	760	35	43	135
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.01	0.00	0.23	0.22
d_M, Delay for Movement [s/veh]	9.47	0.00	0.00	0.00	29.95	12.70
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	0.06	0.00	0.00	0.00	0.86	0.85
95th-Percentile Queue Length [ft/ln]	1.49	0.00	0.00	0.00	21.42	21.37
d_A, Approach Delay [s/veh]	0.21		0.00		16.87	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.88					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 9: Brea Plaza Dwy 4 at Imperial Highway

Control Type:	Two-way stop	Delay (sec / veh):	35.8
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.310

Intersection Setup

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Base Volume Input [veh/h]	0	49	0	2207	2126	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	49	0	2207	2126	36
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	13	0	581	559	9
Total Analysis Volume [veh/h]	0	52	0	2323	2238	38
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.31	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	35.84	0.00	0.00	0.00	0.00
Movement LOS		E		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.24	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	31.05	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	35.84		0.00		0.00	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	0.40					
Intersection LOS	E					

APPENDIX D-III

YEAR 2024 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.649

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	580	0	501	0	1494	796	0	1949	189
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	580	0	501	0	1494	796	0	1949	189
Peak Hour Factor	1.0000	1.0000	1.0000	0.8810	1.0000	0.8810	1.0000	0.9270	0.9270	1.0000	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	165	0	142	0	403	215	0	518	50
Total Analysis Volume [veh/h]	0	0	0	658	0	569	0	1612	859	0	2073	201
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing m		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	0	6	0	0	6	0
Maximum Green [s]	0	0	0	30	0	0	0	30	0	0	30	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	64	0	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall				No				No			No	
Maximum Recall				No				No			No	
Pedestrian Recall				No				No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	C	R	C	C
C, Cycle Length [s]		90	90	90	90	90
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		25	25	25	57	57
g / C, Green / Cycle		0.27	0.27	0.27	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate		0.23	0.23	0.22	0.28	0.36
s, saturation flow rate [veh/h]		1800	1800	1900	5700	5700
c, Capacity [veh/h]		494	494	521	3629	3629
d1, Uniform Delay [s]		30.60	30.60	30.14	8.27	9.32
k, delay calibration		0.11	0.11	0.11	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.63	3.63	2.65	0.40	0.66
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.83	0.83	0.78	0.44	0.57
d, Delay for Lane Group [s/veh]		34.23	34.23	32.78	8.67	9.98
Lane Group LOS		C	C	C	A	A
Critical Lane Group		Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.56	8.56	8.32	4.78	6.96
50th-Percentile Queue Length [ft/ln]		213.89	213.89	207.96	119.54	173.99
95th-Percentile Queue Length [veh/ln]		13.35	13.35	13.05	8.37	11.29
95th-Percentile Queue Length [ft/ln]		333.81	333.81	326.21	209.20	282.15

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	34.23	0.00	33.19	0.00	8.67	0.00	0.00	9.98	0.00
Movement LOS				C		C		A			A	
d_A, Approach Delay [s/veh]	0.00			33.75			8.67			9.98		
Approach LOS	A			C			A			A		
d_I, Intersection Delay [s/veh]	15.49											
Intersection LOS	B											
Intersection V/C	0.649											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.430	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1333	489	489
d_b, Bicycle Delay [s]	45.00	5.00	25.69	25.69
l_b,int, Bicycle LOS Score for Intersection	4.132	3.584	2.446	2.700
Bicycle LOS	D	D	B	B

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	25.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.657

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1037	31	804	0	0	87	100	1373	548	0	1482	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1037	31	804	0	0	87	100	1373	548	0	1482	14
Peak Hour Factor	0.9080	0.9080	0.9080	1.0000	1.0000	0.6820	0.8790	0.8790	0.8790	1.0000	0.8940	0.8940
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	286	9	221	0	0	32	28	391	156	0	414	4
Total Analysis Volume [veh/h]	1142	34	885	0	0	128	114	1562	623	0	1658	16
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	6	6	6	0	0	6	0
Maximum Green [s]	0	30	0	0	0	30	30	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	43	0	0	0	12	12	42	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	22	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No		No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No	No	No			No	
Maximum Recall		No				No	No	No			No	
Pedestrian Recall		No				No	No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	R	L	C	C	C
C, Cycle Length [s]	95	95	95	95	95	95	95	95
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	34	34	34	8	8	49	37	37
g / C, Green / Cycle	0.36	0.36	0.36	0.08	0.08	0.52	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.29	0.29	0.28	0.03	0.06	0.27	0.22	0.22
s, saturation flow rate [veh/h]	3500	1800	1900	3800	1800	5700	5700	1900
c, Capacity [veh/h]	1252	644	680	306	145	2935	2237	746
d1, Uniform Delay [s]	27.64	27.66	27.07	41.64	42.96	15.42	22.52	22.52
k, delay calibration	0.11	0.18	0.16	0.11	0.11	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.31	4.13	2.67	0.91	9.10	0.70	1.02	3.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.81	0.77	0.42	0.79	0.53	0.56	0.56
d, Delay for Lane Group [s/veh]	28.96	31.78	29.74	42.55	52.06	16.12	23.55	25.57
Lane Group LOS	C	C	C	D	D	B	C	C
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	10.30	11.11	10.66	1.46	2.97	7.30	7.26	7.68
50th-Percentile Queue Length [ft/ln]	257.38	277.78	266.44	36.43	74.31	182.50	181.55	192.00
95th-Percentile Queue Length [veh/ln]	15.56	16.58	16.01	2.62	5.35	11.73	11.68	12.22
95th-Percentile Queue Length [ft/ln]	388.93	414.45	400.29	65.58	133.76	293.28	292.04	305.62

Movement, Approach, & Intersection Results

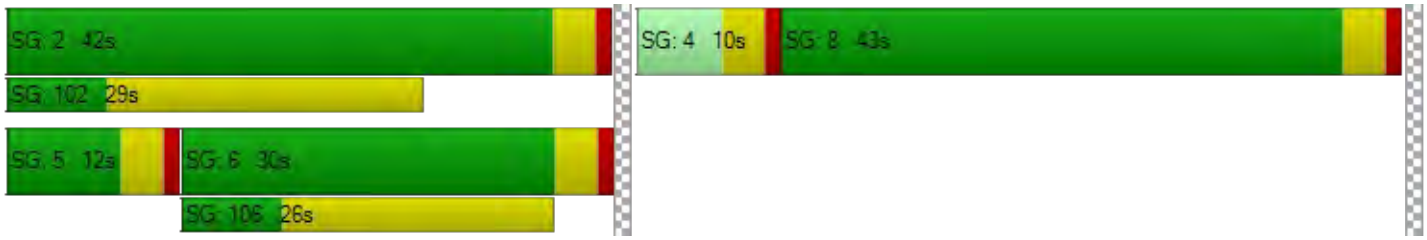
d_M, Delay for Movement [s/veh]	29.24	31.78	30.60	0.00	0.00	42.55	52.06	16.12	0.00	0.00	24.04	25.57
Movement LOS	C	C	C			D	D	B			C	C
d_A, Approach Delay [s/veh]	29.87			42.55			18.56			24.05		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	24.98											
Intersection LOS	C											
Intersection V/C	0.657											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	37.14	37.14	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.704	2.205	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	821	168	800	547
d_b, Bicycle Delay [s]	16.51	39.84	17.10	25.06
l_b,int, Bicycle LOS Score for Intersection	4.960	1.560	2.481	2.250
Bicycle LOS	E	A	B	B

Sequence

Ring 1	-	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	28.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.822

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	239	6	311	55	29	8	2	937	306	344	763	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	239	6	311	55	29	8	2	937	306	344	763	10
Peak Hour Factor	0.8160	0.8160	0.8160	0.7410	0.7410	0.7410	0.8560	0.8560	0.8560	0.9140	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	2	95	19	10	3	1	274	89	94	209	3
Total Analysis Volume [veh/h]	293	7	381	74	39	11	2	1095	357	376	835	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	54	0	0	37	0	10	38	0	18	46	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	25	25	9	9	0	60	60	14	73	73
g / C, Green / Cycle	0.10	0.22	0.22	0.08	0.08	0.00	0.54	0.54	0.12	0.66	0.66
(v / s)_i Volume / Saturation Flow Rate	0.08	0.00	0.20	0.04	0.03	0.00	0.39	0.37	0.11	0.22	0.22
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	1900	1900	3500	1900	1900
c, Capacity [veh/h]	359	425	425	183	161	8	1031	1031	437	1259	1259
d1, Uniform Delay [s]	48.39	33.28	41.48	48.07	47.34	54.64	19.04	18.29	47.25	8.06	8.05
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.56	0.02	6.85	1.43	1.08	16.65	4.50	3.64	5.10	0.72	0.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.02	0.90	0.40	0.31	0.26	0.73	0.68	0.86	0.34	0.34
d, Delay for Lane Group [s/veh]	52.95	33.30	48.33	49.50	48.41	71.29	23.54	21.93	52.35	8.78	8.76
Lane Group LOS	D	C	D	D	D	E	C	C	D	A	A
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.15	0.15	10.75	2.01	1.34	0.09	15.02	13.39	5.34	4.29	4.26
50th-Percentile Queue Length [ft/ln]	103.86	3.71	268.69	50.23	33.42	2.28	375.46	334.76	133.49	107.22	106.62
95th-Percentile Queue Length [veh/ln]	7.48	0.27	16.12	3.62	2.41	0.16	21.37	19.39	9.13	7.69	7.65
95th-Percentile Queue Length [ft/ln]	186.95	6.67	403.11	90.41	60.15	4.10	534.35	484.79	228.23	192.13	191.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.95	33.30	48.33	49.50	48.41	48.41	71.29	23.04	21.93	52.35	8.77	8.76
Movement LOS	D	C	D	D	D	D	E	C	C	D	A	A
d_A, Approach Delay [s/veh]	50.17			49.06			22.83			22.18		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	28.88											
Intersection LOS	C											
Intersection V/C	0.822											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
l_p,int, Pedestrian LOS Score for Intersection	2.699	1.997	2.815	3.018
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	909	600	618	764
d_b, Bicycle Delay [s]	16.36	26.95	26.25	21.02
l_b,int, Bicycle LOS Score for Intersection	2.683	1.764	2.759	2.568
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 4: S.Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	8.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.238

Intersection Setup

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Base Volume Input [veh/h]	110	399	15	19	459	20	7	1	42	42	8	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	399	15	19	459	20	7	1	42	42	8	40
Peak Hour Factor	0.8160	0.8160	0.8160	0.9430	0.9430	0.9430	0.6670	0.6670	0.6670	0.6100	0.6100	0.6100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	122	5	5	122	5	3	0	16	17	3	16
Total Analysis Volume [veh/h]	135	489	18	20	487	21	10	1	63	69	13	66
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	73	73	73	73	73	73	9	9
g / C, Green / Cycle	0.81	0.81	0.81	0.81	0.81	0.81	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.08	0.13	0.13	0.01	0.13	0.13	0.04	0.08
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1900	1800	1800
c, Capacity [veh/h]	1415	1534	1534	1415	1534	1534	232	245
d1, Uniform Delay [s]	1.80	1.92	1.92	1.68	1.92	1.92	37.65	39.34
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.13	0.23	0.23	0.02	0.23	0.23	0.79	2.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.10	0.17	0.16	0.01	0.17	0.16	0.32	0.60
d, Delay for Lane Group [s/veh]	1.93	2.16	2.15	1.70	2.16	2.15	38.44	41.73
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.33	0.66	0.66	0.05	0.67	0.66	1.56	3.31
50th-Percentile Queue Length [ft/ln]	8.31	16.59	16.38	1.15	16.64	16.42	38.91	82.74
95th-Percentile Queue Length [veh/ln]	0.60	1.19	1.18	0.08	1.20	1.18	2.80	5.96
95th-Percentile Queue Length [ft/ln]	14.96	29.87	29.49	2.07	29.95	29.55	70.04	148.93

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.93	2.15	2.15	1.70	2.15	2.15	38.44	38.44	38.44	41.73	41.73	41.73
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.11			2.14			38.44			41.73		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	8.26											
Intersection LOS	A											
Intersection V/C	0.238											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.643	2.527	2.025	1.834
Crosswalk LOS	B	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	444	444	1378	1378
d_b, Bicycle Delay [s]	27.22	27.22	4.36	4.36
l_b,int, Bicycle LOS Score for Intersection	2.089	1.995	1.682	1.804
Bicycle LOS	B	A	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.783

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	148	205	70	155	325	154	207	1859	101	91	1616	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	148	205	70	155	325	154	207	1859	101	91	1616	94
Peak Hour Factor	0.8870	0.8870	0.8870	0.9320	0.9320	0.9320	0.9120	0.9120	0.9120	0.9620	0.9620	0.9620
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	58	20	42	87	41	57	510	28	24	420	24
Total Analysis Volume [veh/h]	167	231	79	166	349	165	227	2038	111	95	1680	98
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	39	0	12	41	0	20	48	0	11	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	29	0	0	26	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	22	22	7	23	23	16	58	58	7	50	50
g / C, Green / Cycle	0.05	0.20	0.20	0.07	0.21	0.21	0.14	0.53	0.53	0.06	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.05	0.08	0.08	0.05	0.18	0.09	0.13	0.37	0.39	0.05	0.23	0.24
s, saturation flow rate [veh/h]	3500	1900	1900	3500	1900	1900	1800	3800	1900	1800	5700	1900
c, Capacity [veh/h]	194	375	375	229	394	394	257	2004	1002	116	2560	853
d1, Uniform Delay [s]	51.59	38.73	38.51	50.47	42.36	37.87	46.30	19.60	20.00	50.87	21.70	22.11
k, delay calibration	0.11	0.11	0.11	0.11	0.12	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.70	0.77	0.69	4.31	7.65	0.71	9.71	2.13	4.69	13.12	0.74	2.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.86	0.43	0.40	0.72	0.89	0.42	0.88	0.71	0.73	0.82	0.51	0.54
d, Delay for Lane Group [s/veh]	62.29	39.50	39.19	54.78	50.01	38.58	56.01	21.73	24.69	64.00	22.44	24.60
Lane Group LOS	E	D	D	D	D	D	E	C	C	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.57	3.87	3.60	2.38	9.97	3.94	6.75	13.62	15.04	3.00	8.10	9.16
50th-Percentile Queue Length [ft/ln]	64.21	96.72	89.88	59.40	249.15	98.38	168.85	340.47	376.12	75.07	202.42	229.04
95th-Percentile Queue Length [veh/ln]	4.62	6.96	6.47	4.28	15.14	7.08	11.02	19.67	21.41	5.41	12.76	14.13
95th-Percentile Queue Length [ft/ln]	115.57	174.09	161.78	106.93	378.58	177.09	275.40	491.78	535.15	135.13	319.08	353.13

Movement, Approach, & Intersection Results

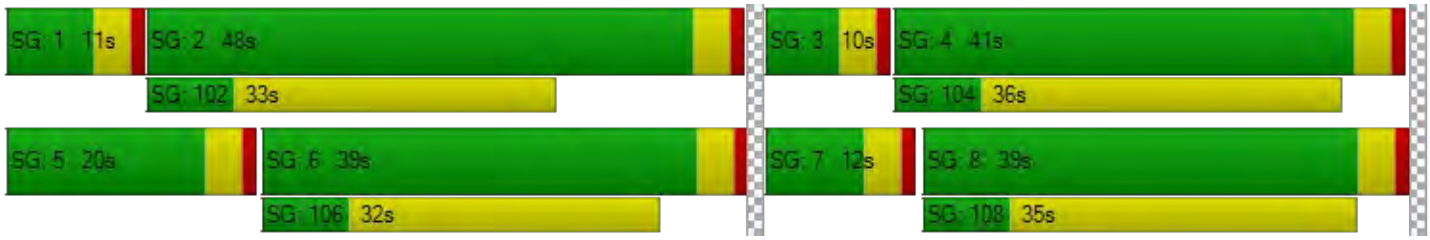
d_M, Delay for Movement [s/veh]	62.29	39.41	39.19	54.78	50.01	38.58	56.01	22.63	24.69	64.00	22.91	24.60
Movement LOS	E	D	D	D	D	D	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	47.38			48.40			25.92			25.08		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	30.35											
Intersection LOS	C											
Intersection V/C	0.783											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
l_p,int, Pedestrian LOS Score for Intersection	2.630	2.663	3.270	3.242
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	636	673	800	636
d_b, Bicycle Delay [s]	25.57	24.22	19.80	25.57
l_b,int, Bicycle LOS Score for Intersection	1.953	2.682	2.866	2.332
Bicycle LOS	A	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	18.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.688

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	179	11	142	25	28	13	12	1823	359	172	1484	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	179	11	142	25	28	13	12	1823	359	172	1484	32
Peak Hour Factor	0.8320	0.8320	0.8320	0.6740	0.6740	0.6740	0.9510	0.9510	0.9510	0.8930	0.8930	0.8930
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	3	43	9	10	5	3	479	94	48	415	9
Total Analysis Volume [veh/h]	215	13	171	37	42	19	13	1917	377	193	1662	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	26	0	0	10	0	10	32	0	22	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	11	11	6	6	2	46	46	12	56	56
g / C, Green / Cycle	0.12	0.12	0.12	0.06	0.06	0.02	0.51	0.51	0.13	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.06	0.07	0.09	0.02	0.03	0.01	0.34	0.20	0.11	0.29	0.31
s, saturation flow rate [veh/h]	1800	1800	1900	1800	1900	1800	5700	1900	1800	3800	1900
c, Capacity [veh/h]	215	215	227	112	118	36	2916	972	233	2361	1181
d1, Uniform Delay [s]	37.26	37.41	38.43	40.50	40.98	43.63	16.20	13.42	38.26	9.16	9.31
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.91	2.16	5.04	1.72	3.48	6.05	1.18	1.17	7.29	0.68	1.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.55	0.75	0.33	0.52	0.36	0.66	0.39	0.83	0.47	0.49
d, Delay for Lane Group [s/veh]	39.17	39.58	43.48	42.22	44.47	49.68	17.38	14.58	45.56	9.84	10.78
Lane Group LOS	D	D	D	D	D	D	B	B	D	A	B
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.37	2.54	3.92	0.83	1.41	0.34	9.28	4.69	4.56	5.41	5.97
50th-Percentile Queue Length [ft/ln]	59.32	63.38	97.97	20.79	35.31	8.60	231.90	117.29	114.03	135.28	149.19
95th-Percentile Queue Length [veh/ln]	4.27	4.56	7.05	1.50	2.54	0.62	14.27	8.24	8.06	9.23	9.97
95th-Percentile Queue Length [ft/ln]	106.77	114.08	176.34	37.42	63.56	15.47	356.78	206.10	201.59	230.65	249.35

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.37	39.58	43.48	42.22	44.47	44.47	49.68	17.38	14.58	45.56	10.15	10.78
Movement LOS	D	D	D	D	D	D	D	B	B	D	B	B
d_A, Approach Delay [s/veh]	41.14			43.62			17.10			13.77		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	18.36											
Intersection LOS	B											
Intersection V/C	0.688											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.496	1.992	0.000	3.153
Crosswalk LOS	B	A	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	133	622	889
d_b, Bicycle Delay [s]	25.69	39.20	21.36	13.89
l_b,int, Bicycle LOS Score for Intersection	2.218	1.721	2.828	2.600
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 7: S. Associated Road at Brea Plaza Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.019

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Base Volume Input [veh/h]	0	510	611	3	0	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	510	611	3	0	12
Peak Hour Factor	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	134	161	1	0	3
Total Analysis Volume [veh/h]	0	537	643	3	0	13
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.46
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.06
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	1.48
d_A, Approach Delay [s/veh]	0.00		0.00		10.46	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.11					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Control Type:	Two-way stop	Delay (sec / veh):	19.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.065

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Base Volume Input [veh/h]	12	493	607	16	16	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	493	607	16	16	25
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	130	160	4	4	7
Total Analysis Volume [veh/h]	13	519	639	17	17	26
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.07	0.04
d_M, Delay for Movement [s/veh]	8.94	0.00	0.00	0.00	19.74	10.61
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.04	0.00	0.00	0.00	0.21	0.12
95th-Percentile Queue Length [ft/ln]	1.07	0.00	0.00	0.00	5.19	3.03
d_A, Approach Delay [s/veh]	0.22		0.00		14.22	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.59					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 9: Brea Plaza Dwy 4 at Imperial Highway

Control Type:	Two-way stop	Delay (sec / veh):	23.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.044

Intersection Setup

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Base Volume Input [veh/h]	0	9	0	2170	1909	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	9	0	2170	1909	10
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	0	571	502	3
Total Analysis Volume [veh/h]	0	9	0	2284	2009	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	23.43	0.00	0.00	0.00	0.00
Movement LOS		C		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.14	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	3.44	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	23.43		0.00		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.05					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	16.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.739

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	651	0	548	0	1682	1051	0	2424	384
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	651	0	548	0	1682	1051	0	2424	384
Peak Hour Factor	1.0000	1.0000	1.0000	0.9390	1.0000	0.9390	1.0000	0.9540	0.9540	1.0000	0.9730	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	173	0	146	0	441	275	0	623	99
Total Analysis Volume [veh/h]	0	0	0	693	0	584	0	1763	1102	0	2491	395
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	0	6	0	0	6	0
Maximum Green [s]	0	0	0	30	0	0	0	30	0	0	30	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	64	0	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall				No				No			No	
Maximum Recall				No				No			No	
Pedestrian Recall				No				No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	C	R	C	C
C, Cycle Length [s]		90	90	90	90	90
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		26	26	26	56	56
g / C, Green / Cycle		0.29	0.29	0.29	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate		0.24	0.24	0.22	0.31	0.44
s, saturation flow rate [veh/h]		1800	1800	1900	5700	5700
c, Capacity [veh/h]		512	512	541	3570	3570
d1, Uniform Delay [s]		30.10	30.10	29.62	9.08	11.14
k, delay calibration		0.11	0.11	0.11	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.56	3.56	2.59	0.49	1.15
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.83	0.83	0.79	0.49	0.70
d, Delay for Lane Group [s/veh]		33.66	33.66	32.20	9.57	12.30
Lane Group LOS		C	C	C	A	B
Critical Lane Group		Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.85	8.85	8.60	5.66	9.91
50th-Percentile Queue Length [ft/ln]		221.27	221.27	214.98	141.52	247.84
95th-Percentile Queue Length [veh/ln]		13.73	13.73	13.41	9.56	15.08
95th-Percentile Queue Length [ft/ln]		343.24	343.24	335.21	239.08	376.93

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	33.66	0.00	32.60	0.00	9.57	0.00	0.00	12.30	0.00
Movement LOS				C		C		A			B	
d_A, Approach Delay [s/veh]	0.00			33.17			9.57			12.30		
Approach LOS	A			C			A			B		
d_I, Intersection Delay [s/veh]	16.25											
Intersection LOS	B											
Intersection V/C	0.739											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.442	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1333	489	489
d_b, Bicycle Delay [s]	45.00	5.00	25.69	25.69
l_b,int, Bicycle LOS Score for Intersection	4.132	3.667	2.529	2.930
Bicycle LOS	D	D	B	C

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	25.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.762

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1090	64	413	0	0	192	182	1805	371	0	2363	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1090	64	413	0	0	192	182	1805	371	0	2363	38
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	0.8840	0.9510	0.9510	0.9510	1.0000	0.9830	0.9830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	287	17	109	0	0	54	48	475	98	0	601	10
Total Analysis Volume [veh/h]	1149	67	435	0	0	217	191	1898	390	0	2404	39
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	6	6	6	0	0	6	0
Maximum Green [s]	0	30	0	0	0	30	30	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	31	0	0	0	19	19	49	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	22	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No		No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No	No	No			No	
Maximum Recall		No				No	No	No			No	
Pedestrian Recall		No				No	No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	R	L	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	26	26	26	12	12	52	37	37
g / C, Green / Cycle	0.29	0.29	0.29	0.13	0.13	0.58	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.23	0.23	0.22	0.06	0.11	0.33	0.32	0.32
s, saturation flow rate [veh/h]	3500	1800	1900	3800	1800	5700	5700	1900
c, Capacity [veh/h]	1000	514	543	495	235	3306	2310	770
d1, Uniform Delay [s]	29.97	29.98	29.51	36.17	38.15	11.93	23.51	23.51
k, delay calibration	0.11	0.19	0.16	0.11	0.11	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.66	5.45	3.56	0.61	6.73	0.73	2.90	8.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.81	0.77	0.44	0.81	0.57	0.79	0.79
d, Delay for Lane Group [s/veh]	31.63	35.43	33.07	36.78	44.88	12.66	26.41	31.74
Lane Group LOS	C	D	C	D	D	B	C	C
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.17	8.95	8.58	2.22	4.48	7.46	11.41	12.55
50th-Percentile Queue Length [ft/ln]	204.16	223.87	214.59	55.41	111.89	186.46	285.19	313.74
95th-Percentile Queue Length [veh/ln]	12.85	13.86	13.39	3.99	7.94	11.94	16.95	18.36
95th-Percentile Queue Length [ft/ln]	321.33	346.57	334.71	99.73	198.62	298.43	423.67	458.98

Movement, Approach, & Intersection Results

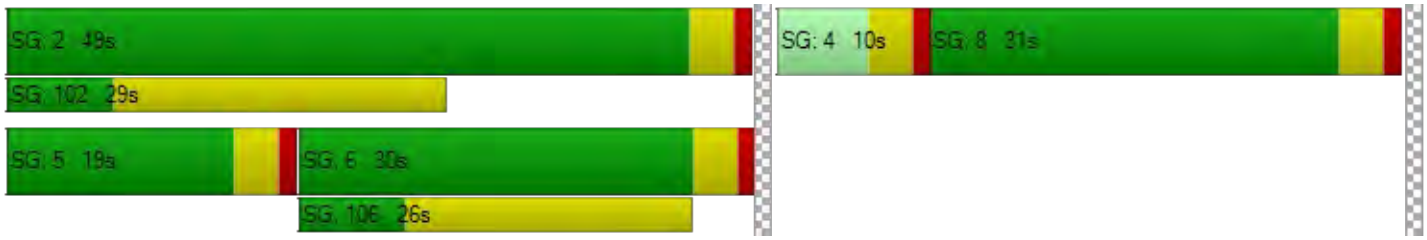
d_M, Delay for Movement [s/veh]	32.72	35.43	33.19	0.00	0.00	36.78	44.88	12.66	0.00	0.00	27.68	31.74
Movement LOS	C	D	C			D	D	B			C	C
d_A, Approach Delay [s/veh]	32.96			36.78			15.61			27.74		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	25.43											
Intersection LOS	C											
Intersection V/C	0.762											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.621	2.256	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	333	1000	578
d_b, Bicycle Delay [s]	22.05	31.25	11.25	22.76
l_b,int, Bicycle LOS Score for Intersection	4.284	1.560	2.709	2.567
Bicycle LOS	E	A	B	B

Sequence

Ring 1	-	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	27.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.691

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	460	32	342	10	20	6	12	874	286	283	1241	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	460	32	342	10	20	6	12	874	286	283	1241	16
Peak Hour Factor	0.9370	0.9370	0.9370	0.8500	0.8500	0.8500	0.9910	0.9910	0.9910	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	123	9	91	3	6	2	3	220	72	75	329	4
Total Analysis Volume [veh/h]	491	34	365	12	24	7	12	882	289	300	1317	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	29	66	0	0	37	0	10	38	0	16	44	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	28	28	5	5	2	68	68	12	78	78
g / C, Green / Cycle	0.16	0.23	0.23	0.04	0.04	0.02	0.57	0.57	0.10	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.14	0.02	0.19	0.01	0.02	0.01	0.32	0.30	0.09	0.35	0.35
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	1900	1900	3500	1900	1900
c, Capacity [veh/h]	564	443	443	77	73	31	1077	1077	351	1235	1235
d1, Uniform Delay [s]	49.11	35.94	43.69	55.85	56.40	58.39	16.60	15.99	53.14	11.34	11.32
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.30	0.07	3.92	0.92	3.85	8.01	2.16	1.80	5.98	1.70	1.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.08	0.82	0.16	0.42	0.39	0.57	0.52	0.85	0.54	0.54
d, Delay for Lane Group [s/veh]	53.41	36.01	47.61	56.78	60.25	66.40	18.76	17.80	59.12	13.04	13.02
Lane Group LOS	D	D	D	E	E	E	B	B	E	B	B
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.50	0.79	10.74	0.37	1.00	0.43	11.02	9.74	4.74	9.61	9.58
50th-Percentile Queue Length [ft/ln]	187.47	19.87	268.38	9.31	24.94	10.73	275.41	243.42	118.50	240.29	239.38
95th-Percentile Queue Length [veh/ln]	11.99	1.43	16.11	0.67	1.80	0.77	16.46	14.85	8.31	14.70	14.65
95th-Percentile Queue Length [ft/ln]	299.75	35.76	402.71	16.75	44.90	19.31	411.49	371.35	207.77	367.41	366.25

Movement, Approach, & Intersection Results

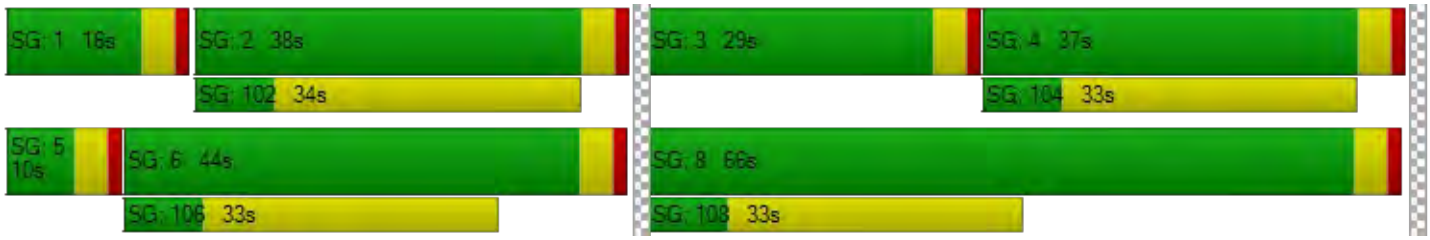
d_M, Delay for Movement [s/veh]	53.41	36.01	47.61	56.78	60.25	60.25	66.40	18.46	17.80	59.12	13.03	13.02
Movement LOS	D	D	D	E	E	E	E	B	B	E	B	B
d_A, Approach Delay [s/veh]	50.37			59.28			18.78			21.49		
Approach LOS	D			E			B			C		
d_I, Intersection Delay [s/veh]	27.92											
Intersection LOS	C											
Intersection V/C	0.691											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	2.711	1.988	2.898	2.954
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1033	550	567	667
d_b, Bicycle Delay [s]	14.02	31.54	30.82	26.67
l_b,int, Bicycle LOS Score for Intersection	3.028	1.631	2.536	2.908
Bicycle LOS	C	A	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: S.Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	8.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.269

Intersection Setup

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Base Volume Input [veh/h]	51	522	37	16	547	9	24	9	102	27	4	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	51	522	37	16	547	9	24	9	102	27	4	35
Peak Hour Factor	0.9310	0.9310	0.9310	0.9120	0.9120	0.9120	0.8960	0.8960	0.8960	0.8090	0.8090	0.8090
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	140	10	4	150	2	7	3	28	8	1	11
Total Analysis Volume [veh/h]	55	561	40	18	600	10	27	10	114	33	5	43
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	72	72	72	72	72	72	9	9
g / C, Green / Cycle	0.81	0.81	0.81	0.81	0.81	0.81	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.03	0.16	0.16	0.01	0.16	0.16	0.08	0.05
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1900	1800	1800
c, Capacity [veh/h]	1396	1530	1530	1397	1530	1530	238	247
d1, Uniform Delay [s]	1.76	2.03	2.02	1.72	2.03	2.03	39.20	37.61
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.29	0.28	0.02	0.29	0.29	2.80	0.77
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.20	0.19	0.01	0.20	0.20	0.64	0.33
d, Delay for Lane Group [s/veh]	1.81	2.32	2.31	1.74	2.33	2.32	42.00	38.37
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.13	0.84	0.82	0.04	0.85	0.84	3.39	1.70
50th-Percentile Queue Length [ft/ln]	3.32	20.95	20.43	1.06	21.13	21.00	84.79	42.56
95th-Percentile Queue Length [veh/ln]	0.24	1.51	1.47	0.08	1.52	1.51	6.10	3.06
95th-Percentile Queue Length [ft/ln]	5.97	37.72	36.78	1.91	38.03	37.80	152.62	76.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.81	2.31	2.31	1.74	2.32	2.32	42.00	42.00	42.00	38.37	38.37	38.37
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.27			2.31			42.00			38.37		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	8.17											
Intersection LOS	A											
Intersection V/C	0.269											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.620	2.583	1.900	1.813
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	444	444	1378	1378
d_b, Bicycle Delay [s]	27.22	27.22	4.36	4.36
l_b,int, Bicycle LOS Score for Intersection	2.101	2.078	1.809	1.693
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	42.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.873

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	216	254	82	278	343	249	260	1820	139	172	1712	173
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	216	254	82	278	343	249	260	1820	139	172	1712	173
Peak Hour Factor	0.9100	0.9100	0.9100	0.8290	0.8290	0.8290	0.9480	0.9480	0.9480	0.9350	0.9350	0.9350
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	59	70	23	84	103	75	69	480	37	46	458	46
Total Analysis Volume [veh/h]	237	279	90	335	414	300	274	1920	147	184	1831	185
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	39	0	16	42	0	24	48	0	17	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	29	0	0	26	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	26	26	12	29	29	20	53	53	13	46	46
g / C, Green / Cycle	0.08	0.22	0.22	0.10	0.24	0.24	0.17	0.44	0.44	0.11	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.07	0.10	0.09	0.10	0.22	0.16	0.15	0.36	0.37	0.10	0.26	0.27
s, saturation flow rate [veh/h]	3500	1900	1900	3500	1900	1900	1800	3800	1900	1800	5700	1900
c, Capacity [veh/h]	267	410	410	354	457	457	301	1674	837	197	2182	727
d1, Uniform Delay [s]	54.97	41.07	40.74	53.67	44.28	41.13	49.16	29.35	29.79	53.07	31.03	31.44
k, delay calibration	0.11	0.11	0.11	0.11	0.23	0.11	0.16	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.66	0.83	0.72	12.79	13.39	1.61	14.76	4.52	9.77	17.71	1.78	5.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.89	0.47	0.43	0.95	0.91	0.66	0.91	0.82	0.84	0.94	0.69	0.71
d, Delay for Lane Group [s/veh]	64.63	41.89	41.47	66.47	57.67	42.74	63.92	33.87	39.56	70.78	32.81	37.29
Lane Group LOS	E	D	D	E	E	D	E	C	D	E	C	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.91	5.04	4.64	5.65	13.58	8.20	9.28	17.84	19.76	6.47	12.33	13.76
50th-Percentile Queue Length [ft/ln]	97.75	126.08	116.07	141.27	339.40	204.91	232.06	445.99	494.01	161.71	308.33	344.12
95th-Percentile Queue Length [veh/ln]	7.04	8.73	8.18	9.55	19.62	12.89	14.28	24.77	27.05	10.64	18.09	19.85
95th-Percentile Queue Length [ft/ln]	175.95	218.16	204.41	238.73	490.47	322.29	356.97	619.17	676.26	265.98	452.32	496.24

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	64.63	41.76	41.47	66.47	57.67	42.74	63.92	35.51	39.56	70.78	33.63	37.29
Movement LOS	E	D	D	E	E	D	E	D	D	E	C	D
d_A, Approach Delay [s/veh]	50.66			56.21			39.09			37.04		
Approach LOS	D			E			D			D		
d_I, Intersection Delay [s/veh]	42.39											
Intersection LOS	D											
Intersection V/C	0.873											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	2.686	2.757	3.313	3.293
Crosswalk LOS	B	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	633	733	617
d_b, Bicycle Delay [s]	30.10	28.02	24.07	28.70
l_b,int, Bicycle LOS Score for Intersection	2.060	3.290	2.847	2.467
Bicycle LOS	B	C	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	24.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.800

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	248	46	261	25	23	13	19	1825	277	226	1873	56
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	248	46	261	25	23	13	19	1825	277	226	1873	56
Peak Hour Factor	0.8580	0.8580	0.8580	0.6480	0.6480	0.6480	0.9520	0.9520	0.9520	0.9460	0.9460	0.9460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	72	13	76	10	9	5	5	479	73	60	495	15
Total Analysis Volume [veh/h]	289	54	304	39	35	20	20	1917	291	239	1980	59
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	26	0	0	10	0	10	32	0	22	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	5	5	2	38	38	14	49	49
g / C, Green / Cycle	0.19	0.19	0.19	0.06	0.06	0.03	0.42	0.42	0.15	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.09	0.10	0.16	0.02	0.03	0.01	0.34	0.15	0.13	0.35	0.37
s, saturation flow rate [veh/h]	1800	1800	1900	1800	1900	1800	5700	1900	1800	3800	1900
c, Capacity [veh/h]	339	339	358	111	117	50	2379	793	279	2071	1035
d1, Uniform Delay [s]	32.70	32.93	35.34	40.60	40.90	43.11	23.06	18.07	37.11	14.44	14.76
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.09	1.24	5.61	1.90	2.93	5.15	3.03	1.31	7.42	1.58	3.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.52	0.85	0.35	0.47	0.40	0.81	0.37	0.86	0.65	0.67
d, Delay for Lane Group [s/veh]	33.79	34.17	40.96	42.50	43.83	48.26	26.09	19.38	44.54	16.02	18.26
Lane Group LOS	C	C	D	D	D	D	C	B	D	B	B
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.28	3.54	6.86	0.88	1.26	0.51	11.91	4.30	5.61	9.25	10.36
50th-Percentile Queue Length [ft/ln]	82.05	88.54	171.53	22.01	31.57	12.63	297.76	107.52	140.30	231.30	258.94
95th-Percentile Queue Length [veh/ln]	5.91	6.37	11.16	1.58	2.27	0.91	17.57	7.70	9.50	14.24	15.64
95th-Percentile Queue Length [ft/ln]	147.68	159.37	278.93	39.61	56.83	22.74	439.26	192.55	237.42	356.01	390.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.95	34.17	40.96	42.50	43.83	43.83	48.26	26.09	19.38	44.54	16.74	18.26
Movement LOS	C	C	D	D	D	D	D	C	B	D	B	B
d_A, Approach Delay [s/veh]	37.26			43.28			25.41			19.70		
Approach LOS	D			D			C			B		
d_I, Intersection Delay [s/veh]	24.71											
Intersection LOS	C											
Intersection V/C	0.800											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.536	2.013	0.000	3.225
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	133	622	889
d_b, Bicycle Delay [s]	25.69	39.20	21.36	13.89
l_b,int, Bicycle LOS Score for Intersection	2.627	1.715	2.785	2.813
Bicycle LOS	B	A	C	C

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 7: S. Associated Road at Brea Plaza Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	11.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Base Volume Input [veh/h]	0	704	774	5	0	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	704	774	5	0	5
Peak Hour Factor	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	185	204	1	0	1
Total Analysis Volume [veh/h]	0	741	815	5	0	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.15
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.03
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.64
d_A, Approach Delay [s/veh]	0.00		0.00		11.15	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.04					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Control Type:	Two-way stop	Delay (sec / veh):	31.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.216

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Base Volume Input [veh/h]	18	668	745	34	36	121
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	668	745	34	36	121
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	176	196	9	9	32
Total Analysis Volume [veh/h]	19	703	784	36	38	127
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.01	0.00	0.22	0.21
d_M, Delay for Movement [s/veh]	9.58	0.00	0.00	0.00	31.05	12.75
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	0.07	0.00	0.00	0.00	0.79	0.81
95th-Percentile Queue Length [ft/ln]	1.81	0.00	0.00	0.00	19.78	20.25
d_A, Approach Delay [s/veh]	0.25		0.00		16.97	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.75					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 9: Brea Plaza Dwy 4 at Imperial Highway

Control Type:	Two-way stop	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.278

Intersection Setup

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Base Volume Input [veh/h]	0	44	0	2221	2149	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	44	0	2221	2149	31
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	12	0	584	566	8
Total Analysis Volume [veh/h]	0	46	0	2338	2262	33
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.28	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	34.99	0.00	0.00	0.00	0.00
Movement LOS		D		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.08	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	26.98	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	34.99		0.00		0.00	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	0.34					
Intersection LOS	D					

APPENDIX D-IV

YEAR 2045 GENERAL PLAN BUILDOUT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	14.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.626

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	606	0	562	0	1697	836	0	2020	189
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	606	0	562	0	1697	836	0	2020	189
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	152	0	141	0	424	209	0	505	47
Total Analysis Volume [veh/h]	0	0	0	606	0	562	0	1697	836	0	2020	189
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	0	6	0	0	6	0
Maximum Green [s]	0	0	0	30	0	0	0	30	0	0	30	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	64	0	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall				No				No			No	
Maximum Recall				No				No			No	
Pedestrian Recall				No				No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	C	R	C	C
C, Cycle Length [s]		90	90	90	90	90
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		24	24	24	58	58
g / C, Green / Cycle		0.26	0.26	0.26	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate		0.22	0.22	0.20	0.30	0.35
s, saturation flow rate [veh/h]		1800	1800	1900	5700	5700
c, Capacity [veh/h]		472	472	498	3698	3698
d1, Uniform Delay [s]		31.19	31.19	30.75	7.89	8.59
k, delay calibration		0.11	0.11	0.11	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.70	3.70	2.71	0.41	0.58
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.82	0.82	0.78	0.46	0.55
d, Delay for Lane Group [s/veh]		34.90	34.90	33.46	8.31	9.17
Lane Group LOS		C	C	C	A	A
Critical Lane Group		Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.20	8.20	7.98	4.90	6.36
50th-Percentile Queue Length [ft/ln]		204.99	204.99	199.48	122.38	158.89
95th-Percentile Queue Length [veh/ln]		12.90	12.90	12.61	8.52	10.49
95th-Percentile Queue Length [ft/ln]		322.40	322.40	315.30	213.09	262.25

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	34.90	0.00	33.90	0.00	8.31	0.00	0.00	9.17	0.00
Movement LOS				C		C		A			A	
d_A, Approach Delay [s/veh]	0.00			34.42			8.31			9.17		
Approach LOS	A			C			A			A		
d_I, Intersection Delay [s/veh]	14.91											
Intersection LOS	B											
Intersection V/C	0.626											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.415	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1333	489	489
d_b, Bicycle Delay [s]	45.00	5.00	25.69	25.69
l_b,int, Bicycle LOS Score for Intersection	4.132	3.487	2.493	2.671
Bicycle LOS	D	C	B	B

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	24.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.633

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1089	43	811	0	0	50	116	1520	575	0	1615	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1089	43	811	0	0	50	116	1520	575	0	1615	18
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	272	11	203	0	0	13	29	380	144	0	404	5
Total Analysis Volume [veh/h]	1089	43	811	0	0	50	116	1520	575	0	1615	18
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	6	6	6	0	0	6	0
Maximum Green [s]	0	30	0	0	0	30	30	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	43	0	0	0	12	12	42	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	22	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No		No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No	No	No			No	
Maximum Recall		No				No	No	No			No	
Pedestrian Recall		No				No	No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	R	L	C	C	C
C, Cycle Length [s]	95	95	95	95	95	95	95	95
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	32	32	8	8	51	39	39
g / C, Green / Cycle	0.34	0.34	0.34	0.08	0.08	0.53	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.27	0.27	0.26	0.01	0.06	0.27	0.21	0.21
s, saturation flow rate [veh/h]	3500	1800	1900	3800	1800	5700	5700	1900
c, Capacity [veh/h]	1190	612	646	310	147	3036	2331	777
d1, Uniform Delay [s]	28.52	28.54	27.98	40.67	42.90	14.17	21.17	21.17
k, delay calibration	0.11	0.15	0.13	0.11	0.11	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.32	3.57	2.28	0.24	9.08	0.59	0.85	2.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.81	0.76	0.16	0.79	0.50	0.53	0.53
d, Delay for Lane Group [s/veh]	29.84	32.11	30.26	40.91	51.98	14.77	22.02	23.70
Lane Group LOS	C	C	C	D	D	B	C	C
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.80	10.48	10.09	0.55	3.02	6.69	6.79	7.15
50th-Percentile Queue Length [ft/ln]	245.06	262.05	252.29	13.80	75.55	167.30	169.63	178.72
95th-Percentile Queue Length [veh/ln]	14.94	15.79	15.30	0.99	5.44	10.93	11.06	11.53
95th-Percentile Queue Length [ft/ln]	373.42	394.79	382.53	24.85	136.00	273.36	276.43	288.34

Movement, Approach, & Intersection Results

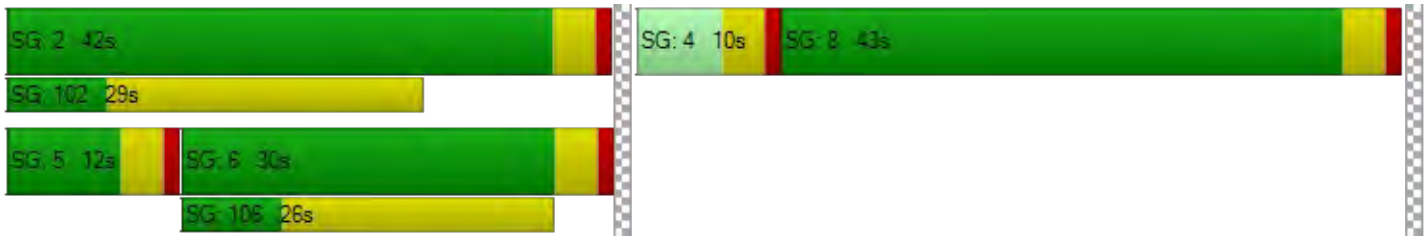
d_M, Delay for Movement [s/veh]	30.10	32.11	31.00	0.00	0.00	40.91	51.98	14.77	0.00	0.00	22.43	23.70
Movement LOS	C	C	C			D	D	B			C	C
d_A, Approach Delay [s/veh]	30.52			40.91			17.41			22.44		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	24.04											
Intersection LOS	C											
Intersection V/C	0.633											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	37.14	37.14	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.681	2.189	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	821	168	800	547
d_b, Bicycle Delay [s]	16.51	39.84	17.10	25.06
l_b,int, Bicycle LOS Score for Intersection	4.766	1.560	2.459	2.233
Bicycle LOS	E	A	B	B

Sequence

Ring 1	-	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	25.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.734

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	247	6	323	58	30	8	2	950	318	368	814	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	247	6	323	58	30	8	2	950	318	368	814	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	2	81	15	8	2	1	238	80	92	204	3
Total Analysis Volume [veh/h]	247	6	323	58	30	8	2	950	318	368	814	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	50	0	0	37	0	10	38	0	17	45	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	20	20	7	7	0	60	60	13	72	72
g / C, Green / Cycle	0.09	0.19	0.19	0.07	0.07	0.00	0.57	0.57	0.12	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.07	0.00	0.17	0.03	0.02	0.00	0.35	0.32	0.11	0.22	0.22
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	1900	1900	3500	1900	1900
c, Capacity [veh/h]	302	369	369	159	132	8	1081	1081	431	1306	1306
d1, Uniform Delay [s]	47.20	34.25	41.14	47.02	46.43	52.16	14.97	14.38	45.16	6.56	6.55
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.38	0.02	6.67	1.40	1.18	16.15	2.57	2.12	4.91	0.64	0.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.02	0.88	0.37	0.29	0.25	0.61	0.56	0.85	0.32	0.32
d, Delay for Lane Group [s/veh]	52.59	34.27	47.80	48.42	47.61	68.31	17.55	16.51	50.08	7.20	7.19
Lane Group LOS	D	C	D	D	D	E	B	B	D	A	A
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.39	0.13	8.72	1.52	0.98	0.09	10.55	9.30	4.96	3.51	3.49
50th-Percentile Queue Length [ft/ln]	84.67	3.15	217.99	37.92	24.62	2.19	263.69	232.60	124.12	87.78	87.27
95th-Percentile Queue Length [veh/ln]	6.10	0.23	13.56	2.73	1.77	0.16	15.87	14.31	8.62	6.32	6.28
95th-Percentile Queue Length [ft/ln]	152.41	5.67	339.06	68.25	44.31	3.94	396.85	357.66	215.48	158.00	157.09

Movement, Approach, & Intersection Results

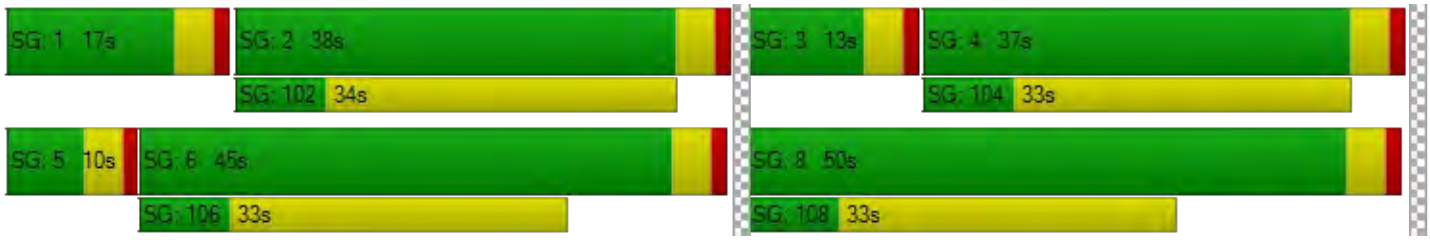
d_M, Delay for Movement [s/veh]	52.59	34.27	47.80	48.42	47.61	47.61	68.31	17.23	16.51	50.08	7.19	7.19
Movement LOS	D	C	D	D	D	D	E	B	B	D	A	A
d_A, Approach Delay [s/veh]	49.71			48.10			17.13			20.42		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	25.32											
Intersection LOS	C											
Intersection V/C	0.734											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
l_p,int, Pedestrian LOS Score for Intersection	2.670	1.985	2.763	2.953
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	876	629	648	781
d_b, Bicycle Delay [s]	16.58	24.69	24.00	19.50
l_b,int, Bicycle LOS Score for Intersection	2.510	1.718	2.607	2.544
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: S.Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	6.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.207

Intersection Setup

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Base Volume Input [veh/h]	56	413	16	20	492	22	19	1	38	44	8	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	413	16	20	492	22	19	1	38	44	8	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	103	4	5	123	6	5	0	10	11	2	11
Total Analysis Volume [veh/h]	56	413	16	20	492	22	19	1	38	44	8	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	76	76	76	76	76	6	6
g / C, Green / Cycle	0.84	0.84	0.84	0.84	0.84	0.84	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.03	0.11	0.11	0.01	0.14	0.13	0.03	0.05
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1900	1800	1800
c, Capacity [veh/h]	1495	1600	1600	1504	1600	1600	177	183
d1, Uniform Delay [s]	1.15	1.26	1.26	1.13	1.30	1.29	40.28	41.13
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.18	0.17	0.02	0.22	0.21	1.07	2.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.13	0.13	0.01	0.16	0.16	0.33	0.51
d, Delay for Lane Group [s/veh]	1.20	1.44	1.43	1.15	1.51	1.51	41.35	43.37
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.08	0.33	0.33	0.03	0.41	0.41	1.27	2.14
50th-Percentile Queue Length [ft/ln]	2.00	8.33	8.24	0.70	10.27	10.13	31.86	53.40
95th-Percentile Queue Length [veh/ln]	0.14	0.60	0.59	0.05	0.74	0.73	2.29	3.84
95th-Percentile Queue Length [ft/ln]	3.61	15.00	14.83	1.26	18.49	18.23	57.35	96.11

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.20	1.44	1.43	1.15	1.51	1.51	41.35	41.35	41.35	43.37	43.37	43.37
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.41			1.50			41.35			43.37		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.79											
Intersection LOS	A											
Intersection V/C	0.207											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.568	2.523	1.864	1.807
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	444	444	1378	1378
d_b, Bicycle Delay [s]	27.22	27.22	4.36	4.36
l_b,int, Bicycle LOS Score for Intersection	1.960	2.000	1.655	1.715
Bicycle LOS	A	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	27.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.816

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	150	217	93	153	345	153	154	2166	106	96	1794	86
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	217	93	153	345	153	154	2166	106	96	1794	86
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	54	23	38	86	38	39	542	27	24	449	22
Total Analysis Volume [veh/h]	150	217	93	153	345	153	154	2166	106	96	1794	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	39	0	11	40	0	14	40	0	10	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	29	0	0	26	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	21	21	6	21	21	10	51	51	6	47	47
g / C, Green / Cycle	0.06	0.21	0.21	0.06	0.21	0.21	0.10	0.51	0.51	0.06	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.04	0.08	0.08	0.04	0.18	0.08	0.09	0.39	0.41	0.05	0.24	0.26
s, saturation flow rate [veh/h]	3500	1900	1900	3500	1900	1900	1800	3800	1900	1800	5700	1900
c, Capacity [veh/h]	213	390	390	221	395	395	181	1941	970	110	2684	895
d1, Uniform Delay [s]	46.14	34.53	34.30	45.95	38.39	34.17	44.29	19.78	20.26	46.65	18.52	18.94
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.22	0.70	0.61	3.83	6.14	0.62	10.53	3.04	6.86	18.82	0.71	2.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.70	0.41	0.38	0.69	0.87	0.39	0.85	0.77	0.80	0.88	0.52	0.55
d, Delay for Lane Group [s/veh]	50.35	35.23	34.91	49.78	44.53	34.79	54.82	22.82	27.12	65.47	19.24	21.39
Lane Group LOS	D	D	C	D	D	C	D	C	C	E	B	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.95	3.45	3.17	1.97	8.74	3.25	4.26	14.01	15.85	2.93	7.38	8.48
50th-Percentile Queue Length [ft/ln]	48.63	86.32	79.35	49.28	218.61	81.35	106.40	350.27	396.34	73.22	184.50	211.94
95th-Percentile Queue Length [veh/ln]	3.50	6.22	5.71	3.55	13.59	5.86	7.64	20.15	22.38	5.27	11.84	13.25
95th-Percentile Queue Length [ft/ln]	87.54	155.38	142.83	88.70	339.85	146.43	190.98	503.74	559.59	131.79	295.89	331.31

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	50.35	35.15	34.91	49.78	44.53	34.79	54.82	24.15	27.12	65.47	19.73	21.39
Movement LOS	D	D	C	D	D	C	D	C	C	E	B	C
d_A, Approach Delay [s/veh]	40.06			43.48			26.22			22.02		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	27.91											
Intersection LOS	C											
Intersection V/C	0.816											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.621	2.638	3.282	3.265
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	720	720	640
d_b, Bicycle Delay [s]	21.13	20.48	20.48	23.12
l_b,int, Bicycle LOS Score for Intersection	1.939	2.634	2.894	2.375
Bicycle LOS	A	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	17.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	191	12	149	26	29	14	14	2000	478	201	1643	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	191	12	149	26	29	14	14	2000	478	201	1643	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	3	37	7	7	4	4	500	120	50	411	9
Total Analysis Volume [veh/h]	191	12	149	26	29	14	14	2000	478	201	1643	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	26	0	0	10	0	10	32	0	22	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	10	5	5	2	47	47	12	58	58
g / C, Green / Cycle	0.11	0.11	0.11	0.06	0.06	0.02	0.53	0.53	0.13	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.05	0.06	0.08	0.01	0.02	0.01	0.35	0.25	0.11	0.29	0.30
s, saturation flow rate [veh/h]	1800	1800	1900	1800	1900	1800	5700	1900	1800	3800	1900
c, Capacity [veh/h]	193	193	204	101	106	38	2993	998	241	2425	1213
d1, Uniform Delay [s]	38.01	38.15	38.99	40.77	41.11	43.55	15.66	13.59	38.05	8.32	8.46
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.08	2.35	4.98	1.33	2.45	5.86	1.20	1.65	7.30	0.62	1.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.51	0.54	0.73	0.26	0.40	0.37	0.67	0.48	0.83	0.45	0.47
d, Delay for Lane Group [s/veh]	40.09	40.50	43.97	42.10	43.56	49.41	16.87	15.23	45.35	8.94	9.78
Lane Group LOS	D	D	D	D	D	D	B	B	D	A	A
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.14	2.29	3.43	0.58	0.99	0.37	9.54	6.18	4.74	4.98	5.49
50th-Percentile Queue Length [ft/ln]	53.49	57.14	85.73	14.62	24.64	9.18	238.50	154.56	118.58	124.38	137.25
95th-Percentile Queue Length [veh/ln]	3.85	4.11	6.17	1.05	1.77	0.66	14.61	10.26	8.31	8.63	9.33
95th-Percentile Queue Length [ft/ln]	96.29	102.85	154.31	26.32	44.35	16.52	365.14	256.50	207.87	215.83	233.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.29	40.50	43.97	42.10	43.56	43.56	49.41	16.87	15.23	45.35	9.22	9.78
Movement LOS	D	D	D	D	D	D	D	B	B	D	A	A
d_A, Approach Delay [s/veh]	41.85			43.01			16.74			13.09		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	17.53											
Intersection LOS	B											
Intersection V/C	0.685											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
I_p,int, Pedestrian LOS Score for Intersection	2.506	1.982	0.000	3.158
Crosswalk LOS	B	A	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	133	622	889
d_b, Bicycle Delay [s]	25.69	39.20	21.36	13.89
I_b,int, Bicycle LOS Score for Intersection	2.140	1.673	2.930	2.593
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 7: S. Associated Road at Brea Plaza Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Base Volume Input [veh/h]	0	453	636	11	0	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	453	636	11	0	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	113	159	3	0	2
Total Analysis Volume [veh/h]	0	453	636	11	0	8
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.42
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.04
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.90
d_A, Approach Delay [s/veh]	0.00		0.00		10.42	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Control Type:	Two-way stop	Delay (sec / veh):	18.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.039

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Base Volume Input [veh/h]	11	446	631	13	11	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	446	631	13	11	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	112	158	3	3	5
Total Analysis Volume [veh/h]	11	446	631	13	11	20
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.04	0.03
d_M, Delay for Movement [s/veh]	8.89	0.00	0.00	0.00	18.28	10.51
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.04	0.00	0.00	0.00	0.12	0.09
95th-Percentile Queue Length [ft/ln]	0.89	0.00	0.00	0.00	3.03	2.29
d_A, Approach Delay [s/veh]	0.21		0.00		13.26	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.45					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 9: Brea Plaza Dwy 4 at Imperial Highway

Control Type:	Two-way stop	Delay (sec / veh):	24.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.047

Intersection Setup

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Base Volume Input [veh/h]	0	9	0	2426	2088	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	9	0	2426	2088	9
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	0	607	522	2
Total Analysis Volume [veh/h]	0	9	0	2426	2088	9
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.05	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	24.61	0.00	0.00	0.00	0.00
Movement LOS		C		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.15	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	3.65	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	24.61		0.00		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.05					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	16.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.755

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	683	0	601	0	1889	1104	0	2565	407
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	683	0	601	0	1889	1104	0	2565	407
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	171	0	150	0	472	276	0	641	102
Total Analysis Volume [veh/h]	0	0	0	683	0	601	0	1889	1104	0	2565	407
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing m		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	0	6	0	0	6	0
Maximum Green [s]	0	0	0	30	0	0	0	30	0	0	30	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	64	0	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall				No				No			No	
Maximum Recall				No				No			No	
Pedestrian Recall				No				No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	C	R	C	C
C, Cycle Length [s]		90	90	90	90	90
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		26	26	26	56	56
g / C, Green / Cycle		0.29	0.29	0.29	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate		0.24	0.24	0.23	0.33	0.45
s, saturation flow rate [veh/h]		1800	1800	1900	5700	5700
c, Capacity [veh/h]		515	515	544	3561	3561
d1, Uniform Delay [s]		30.02	30.02	29.54	9.46	11.50
k, delay calibration		0.11	0.11	0.11	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.54	3.54	2.57	0.57	1.29
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.83	0.83	0.79	0.53	0.72
d, Delay for Lane Group [s/veh]		33.57	33.57	32.11	10.03	12.79
Lane Group LOS		C	C	C	B	B
Critical Lane Group		Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.89	8.89	8.64	6.31	10.53
50th-Percentile Queue Length [ft/ln]		222.25	222.25	215.91	157.75	263.26
95th-Percentile Queue Length [veh/ln]		13.78	13.78	13.46	10.43	15.85
95th-Percentile Queue Length [ft/ln]		344.50	344.50	336.40	260.74	396.31

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	33.57	0.00	32.53	0.00	10.03	0.00	0.00	12.79	0.00
Movement LOS				C		C		B			B	
d_A, Approach Delay [s/veh]	0.00			33.08			10.03			12.79		
Approach LOS	A			C			B			B		
d_I, Intersection Delay [s/veh]	16.42											
Intersection LOS	B											
Intersection V/C	0.755											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.444	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1333	489	489
d_b, Bicycle Delay [s]	45.00	5.00	25.69	25.69
l_b,int, Bicycle LOS Score for Intersection	4.132	3.678	2.599	2.970
Bicycle LOS	D	D	B	C

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.778

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1143	72	430	0	0	231	206	1799	390	0	2526	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1143	72	430	0	0	231	206	1799	390	0	2526	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	286	18	108	0	0	58	52	450	98	0	632	12
Total Analysis Volume [veh/h]	1143	72	430	0	0	231	206	1799	390	0	2526	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	6	6	6	0	0	6	0
Maximum Green [s]	0	30	0	0	0	30	30	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	35	0	0	0	25	25	55	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	22	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No		No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No	No	No			No	
Maximum Recall		No				No	No	No			No	
Pedestrian Recall		No				No	No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	R	L	C	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	28	28	28	14	14	60	42	42
g / C, Green / Cycle	0.28	0.28	0.28	0.14	0.14	0.60	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.23	0.23	0.22	0.06	0.11	0.32	0.34	0.34
s, saturation flow rate [veh/h]	3500	1800	1900	3800	1800	5700	5700	1900
c, Capacity [veh/h]	986	507	535	529	251	3404	2383	794
d1, Uniform Delay [s]	33.61	33.62	33.09	39.50	41.90	11.87	25.63	25.63
k, delay calibration	0.11	0.19	0.16	0.11	0.11	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.78	5.70	3.68	0.57	6.63	0.59	3.10	8.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.82	0.78	0.44	0.82	0.53	0.81	0.81
d, Delay for Lane Group [s/veh]	35.38	39.32	36.77	40.07	48.52	12.46	28.73	34.38
Lane Group LOS	D	D	D	D	D	B	C	C
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.24	10.08	9.68	2.63	5.36	7.47	13.59	14.83
50th-Percentile Queue Length [ft/ln]	231.10	251.91	241.90	65.78	133.98	186.66	339.70	370.82
95th-Percentile Queue Length [veh/ln]	14.23	15.28	14.78	4.74	9.16	11.95	19.63	21.15
95th-Percentile Queue Length [ft/ln]	355.76	382.05	369.43	118.40	228.90	298.69	490.83	528.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.51	39.32	36.89	0.00	0.00	40.07	48.52	12.46	0.00	0.00	30.07	34.38
Movement LOS	D	D	D			D	D	B			C	C
d_A, Approach Delay [s/veh]	36.73			40.07			16.17			30.14		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	27.84											
Intersection LOS	C											
Intersection V/C	0.778											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.625	2.271	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	620	420	1020	520
d_b, Bicycle Delay [s]	23.81	31.21	12.01	27.38
l_b,int, Bicycle LOS Score for Intersection	4.274	1.560	2.662	2.621
Bicycle LOS	E	A	B	B

Sequence

Ring 1	-	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	483	34	368	11	21	6	12	889	300	300	1248	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	483	34	368	11	21	6	12	889	300	300	1248	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	121	9	92	3	5	2	3	222	75	75	312	4
Total Analysis Volume [veh/h]	483	34	368	11	21	6	12	889	300	300	1248	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	24	61	0	0	37	0	10	38	0	16	44	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	26	26	4	4	2	65	65	12	75	75
g / C, Green / Cycle	0.16	0.23	0.23	0.04	0.04	0.02	0.57	0.57	0.10	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.14	0.02	0.19	0.01	0.01	0.01	0.33	0.30	0.09	0.33	0.33
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	1900	1900	3500	1900	1900
c, Capacity [veh/h]	548	434	434	76	71	31	1074	1074	358	1235	1235
d1, Uniform Delay [s]	47.48	34.87	42.48	53.65	54.09	55.94	16.14	15.53	50.71	10.56	10.54
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.87	0.08	4.68	0.86	3.37	7.82	2.26	1.88	5.28	1.52	1.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.08	0.85	0.14	0.38	0.39	0.58	0.53	0.84	0.51	0.51
d, Delay for Lane Group [s/veh]	52.35	34.95	47.16	54.51	57.47	63.76	18.40	17.41	56.00	12.08	12.06
Lane Group LOS	D	C	D	D	E	E	B	B	E	B	B
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.11	0.76	10.51	0.33	0.83	0.41	10.78	9.50	4.50	8.38	8.35
50th-Percentile Queue Length [ft/ln]	177.86	19.08	262.63	8.17	20.75	10.29	269.50	237.50	112.40	209.60	208.65
95th-Percentile Queue Length [veh/ln]	11.49	1.37	15.82	0.59	1.49	0.74	16.16	14.55	7.97	13.13	13.08
95th-Percentile Queue Length [ft/ln]	287.21	34.35	395.52	14.71	37.35	18.52	404.11	363.87	199.34	328.32	327.09

Movement, Approach, & Intersection Results

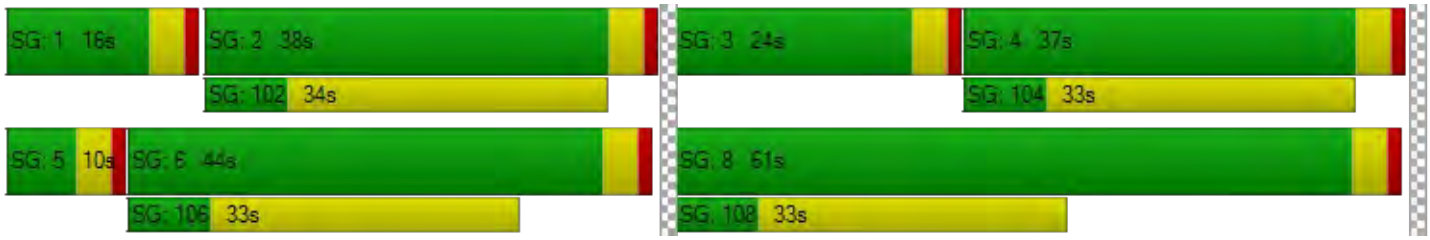
d_M, Delay for Movement [s/veh]	52.35	34.95	47.16	54.51	57.47	57.47	63.76	18.10	17.41	56.00	12.07	12.06
Movement LOS	D	C	D	D	E	E	E	B	B	E	B	B
d_A, Approach Delay [s/veh]	49.53			56.61			18.38			20.49		
Approach LOS	D			E			B			C		
d_I, Intersection Delay [s/veh]	27.14											
Intersection LOS	C											
Intersection V/C	0.703											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.03	47.03	47.03	47.03
l_p,int, Pedestrian LOS Score for Intersection	2.709	1.985	2.884	2.941
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	991	574	591	696
d_b, Bicycle Delay [s]	14.63	29.23	28.53	24.46
l_b,int, Bicycle LOS Score for Intersection	3.020	1.622	2.550	2.851
Bicycle LOS	C	A	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: S.Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	6.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.228

Intersection Setup

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Base Volume Input [veh/h]	44	560	39	17	579	18	36	9	42	28	4	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	560	39	17	579	18	36	9	42	28	4	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	140	10	4	145	5	9	2	11	7	1	9
Total Analysis Volume [veh/h]	44	560	39	17	579	18	36	9	42	28	4	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	76	76	76	76	76	6	6
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.85	0.85	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.02	0.16	0.16	0.01	0.16	0.16	0.05	0.04
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1900	1800	1800
c, Capacity [veh/h]	1495	1609	1609	1495	1609	1609	172	172
d1, Uniform Delay [s]	1.08	1.25	1.25	1.06	1.25	1.25	41.38	40.95
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.04	0.26	0.25	0.01	0.26	0.25	2.29	1.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.03	0.19	0.18	0.01	0.19	0.18	0.51	0.40
d, Delay for Lane Group [s/veh]	1.12	1.51	1.50	1.08	1.51	1.50	43.67	42.47
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.06	0.45	0.44	0.02	0.45	0.44	1.98	1.54
50th-Percentile Queue Length [ft/ln]	1.43	11.27	11.00	0.54	11.15	11.03	49.61	38.60
95th-Percentile Queue Length [veh/ln]	0.10	0.81	0.79	0.04	0.80	0.79	3.57	2.78
95th-Percentile Queue Length [ft/ln]	2.57	20.29	19.80	0.98	20.08	19.86	89.30	69.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.12	1.51	1.50	1.08	1.50	1.50	43.67	43.67	43.67	42.47	42.47	42.47
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.48			1.49			43.67			42.47		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.08											
Intersection LOS	A											
Intersection V/C	0.228											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.591	2.594	1.852	1.804
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	444	444	1378	1378
d_b, Bicycle Delay [s]	27.22	27.22	4.36	4.36
l_b,int, Bicycle LOS Score for Intersection	2.090	2.066	1.703	1.673
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	39.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.847

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	228	272	103	302	363	234	261	1879	146	210	1950	176
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	228	272	103	302	363	234	261	1879	146	210	1950	176
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	68	26	76	91	59	65	470	37	53	488	44
Total Analysis Volume [veh/h]	228	272	103	302	363	234	261	1879	146	210	1950	176
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	39	0	15	42	0	23	47	0	19	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	29	0	0	26	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	23	23	11	26	26	19	55	55	15	51	51
g / C, Green / Cycle	0.07	0.19	0.19	0.09	0.21	0.21	0.16	0.46	0.46	0.13	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.07	0.10	0.09	0.09	0.19	0.12	0.15	0.35	0.36	0.12	0.28	0.29
s, saturation flow rate [veh/h]	3500	1900	1900	3500	1900	1900	1800	3800	1900	1800	5700	1900
c, Capacity [veh/h]	236	359	359	323	406	406	285	1749	875	226	2434	811
d1, Uniform Delay [s]	55.86	44.03	43.63	54.14	45.88	42.33	49.71	27.00	27.37	51.98	27.24	27.71
k, delay calibration	0.11	0.11	0.11	0.11	0.17	0.11	0.14	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	20.43	1.29	1.08	12.28	10.30	1.29	14.04	3.26	6.98	15.40	1.35	4.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.97	0.54	0.50	0.94	0.89	0.58	0.91	0.77	0.78	0.93	0.65	0.68
d, Delay for Lane Group [s/veh]	76.28	45.31	44.71	66.42	56.19	43.62	63.75	30.27	34.35	67.38	28.59	32.22
Lane Group LOS	E	D	D	E	E	D	E	C	C	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.11	5.39	4.91	5.08	11.63	6.37	8.80	16.40	17.89	7.21	12.08	13.53
50th-Percentile Queue Length [ft/ln]	102.76	134.70	122.63	126.93	290.84	159.33	219.96	409.92	447.33	180.36	301.92	338.16
95th-Percentile Queue Length [veh/ln]	7.40	9.19	8.54	8.77	17.23	10.51	13.66	23.04	24.83	11.62	17.78	19.56
95th-Percentile Queue Length [ft/ln]	184.97	229.87	213.43	219.31	430.68	262.84	341.58	575.94	620.76	290.48	444.40	488.95

Movement, Approach, & Intersection Results

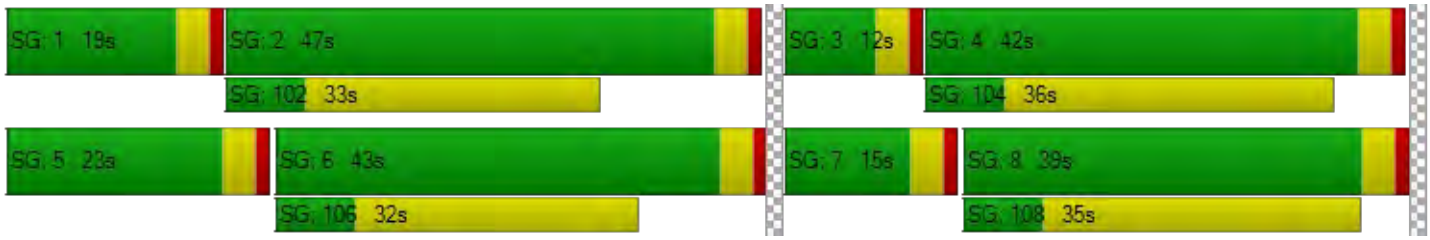
d_M, Delay for Movement [s/veh]	76.28	45.14	44.71	66.42	56.19	43.62	63.75	31.44	34.35	67.38	29.28	32.22
Movement LOS	E	D	D	E	E	D	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	56.84			56.35			35.31			32.93		
Approach LOS	E			E			D			C		
d_I, Intersection Delay [s/veh]	39.61											
Intersection LOS	D											
Intersection V/C	0.847											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	2.681	2.728	3.312	3.302
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	633	717	650
d_b, Bicycle Delay [s]	30.10	28.02	24.70	27.34
l_b,int, Bicycle LOS Score for Intersection	2.057	3.043	2.817	2.523
Bicycle LOS	B	C	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	23.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.769

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	274	48	277	26	24	14	20	1910	295	237	2116	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	274	48	277	26	24	14	20	1910	295	237	2116	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	12	69	7	6	4	5	478	74	59	529	15
Total Analysis Volume [veh/h]	274	48	277	26	24	14	20	1910	295	237	2116	59
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	26	0	0	10	0	10	32	0	22	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	5	5	2	40	40	14	51	51
g / C, Green / Cycle	0.18	0.18	0.18	0.05	0.05	0.03	0.44	0.44	0.15	0.57	0.57
(v / s)_i Volume / Saturation Flow Rate	0.09	0.09	0.15	0.01	0.02	0.01	0.34	0.16	0.13	0.38	0.39
s, saturation flow rate [veh/h]	1800	1800	1900	1800	1900	1800	5700	1900	1800	3800	1900
c, Capacity [veh/h]	316	316	334	98	104	50	2498	833	277	2146	1073
d1, Uniform Delay [s]	33.53	33.75	35.86	40.90	41.13	43.11	21.40	16.84	37.16	13.70	14.06
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.18	1.36	5.30	1.42	2.16	5.15	2.29	1.18	7.41	1.66	3.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.53	0.83	0.27	0.37	0.40	0.76	0.35	0.85	0.67	0.69
d, Delay for Lane Group [s/veh]	34.72	35.11	41.16	42.33	43.30	48.26	23.69	18.02	44.57	15.36	17.77
Lane Group LOS	C	D	D	D	D	D	C	B	D	B	B
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.13	3.37	6.25	0.59	0.87	0.51	11.20	4.17	5.57	9.64	10.89
50th-Percentile Queue Length [ft/ln]	78.15	84.31	156.13	14.68	21.71	12.63	280.05	104.14	139.15	241.06	272.19
95th-Percentile Queue Length [veh/ln]	5.63	6.07	10.34	1.06	1.56	0.91	16.69	7.50	9.43	14.73	16.30
95th-Percentile Queue Length [ft/ln]	140.67	151.76	258.59	26.43	39.08	22.74	417.27	187.45	235.87	368.37	407.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.88	35.11	41.16	42.33	43.30	43.30	48.26	23.69	18.02	44.57	16.14	17.77
Movement LOS	C	D	D	D	D	D	D	C	B	D	B	B
d_A, Approach Delay [s/veh]	37.81			42.90			23.16			18.97		
Approach LOS	D			D			C			B		
d_I, Intersection Delay [s/veh]	23.15											
Intersection LOS	C											
Intersection V/C	0.769											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.525	2.002	0.000	3.238
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	133	622	889
d_b, Bicycle Delay [s]	25.69	39.20	21.36	13.89
l_b,int, Bicycle LOS Score for Intersection	2.548	1.665	2.783	2.886
Bicycle LOS	B	A	C	C

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 7: S. Associated Road at Brea Plaza Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Base Volume Input [veh/h]	0	737	767	9	0	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	737	767	9	0	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	184	192	2	0	10
Total Analysis Volume [veh/h]	0	737	767	9	0	40
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.07
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.31
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.21
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	5.24
d_A, Approach Delay [s/veh]	0.00		0.00		11.31	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.29					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Control Type:	Two-way stop	Delay (sec / veh):	30.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.224

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Base Volume Input [veh/h]	15	694	775	33	41	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	694	775	33	41	124
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	174	194	8	10	31
Total Analysis Volume [veh/h]	15	694	775	33	41	124
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.01	0.00	0.22	0.21
d_M, Delay for Movement [s/veh]	9.51	0.00	0.00	0.00	30.28	12.62
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	0.06	0.00	0.00	0.00	0.83	0.78
95th-Percentile Queue Length [ft/ln]	1.41	0.00	0.00	0.00	20.70	19.44
d_A, Approach Delay [s/veh]	0.20		0.00		17.01	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.75					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 9: Brea Plaza Dwy 4 at Imperial Highway

Control Type:	Two-way stop	Delay (sec / veh):	39.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.318

Intersection Setup

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Base Volume Input [veh/h]	0	48	0	2286	2377	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	48	0	2286	2377	35
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	12	0	572	594	9
Total Analysis Volume [veh/h]	0	48	0	2286	2377	35
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.32	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	39.62	0.00	0.00	0.00	0.00
Movement LOS		E		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.27	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	31.84	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	39.62		0.00		0.00	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	0.40					
Intersection LOS	E					

APPENDIX D-V

YEAR 2045 GENERAL PLAN BUILDOUT PLUS PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	14.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.632

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	609	0	562	0	1712	836	0	2048	198
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	609	0	562	0	1712	836	0	2048	198
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	152	0	141	0	428	209	0	512	50
Total Analysis Volume [veh/h]	0	0	0	609	0	562	0	1712	836	0	2048	198
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	0	6	0	0	6	0
Maximum Green [s]	0	0	0	30	0	0	0	30	0	0	30	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	64	0	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall				No				No			No	
Maximum Recall				No				No			No	
Pedestrian Recall				No				No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	C	R	C	C
C, Cycle Length [s]		90	90	90	90	90
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		24	24	24	58	58
g / C, Green / Cycle		0.26	0.26	0.26	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate		0.22	0.22	0.21	0.30	0.36
s, saturation flow rate [veh/h]		1800	1800	1900	5700	5700
c, Capacity [veh/h]		473	473	499	3694	3694
d1, Uniform Delay [s]		31.16	31.16	30.71	7.95	8.68
k, delay calibration		0.11	0.11	0.11	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.70	3.70	2.71	0.42	0.60
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.82	0.82	0.78	0.46	0.55
d, Delay for Lane Group [s/veh]		34.86	34.86	33.43	8.37	9.29
Lane Group LOS		C	C	C	A	A
Critical Lane Group		Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.22	8.22	8.00	4.97	6.51
50th-Percentile Queue Length [ft/ln]		205.45	205.45	199.92	124.26	162.79
95th-Percentile Queue Length [veh/ln]		12.92	12.92	12.63	8.63	10.70
95th-Percentile Queue Length [ft/ln]		322.98	322.98	315.86	215.66	267.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	34.86	0.00	33.86	0.00	8.37	0.00	0.00	9.29	0.00
Movement LOS				C		C		A			A	
d_A, Approach Delay [s/veh]	0.00			34.38			8.37			9.29		
Approach LOS	A			C			A			A		
d_I, Intersection Delay [s/veh]	14.93											
Intersection LOS	B											
Intersection V/C	0.632											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.416	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1333	489	489
d_b, Bicycle Delay [s]	45.00	5.00	25.69	25.69
l_b,int, Bicycle LOS Score for Intersection	4.132	3.492	2.501	2.686
Bicycle LOS	D	C	B	B

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	23.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.633

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1089	30	831	0	0	84	95	1560	575	0	1623	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1089	30	831	0	0	84	95	1560	575	0	1623	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	272	8	208	0	0	21	24	390	144	0	406	3
Total Analysis Volume [veh/h]	1089	30	831	0	0	84	95	1560	575	0	1623	13
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	6	6	6	0	0	6	0
Maximum Green [s]	0	30	0	0	0	30	30	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	40	0	0	0	10	10	40	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	22	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No		No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No	No	No			No	
Maximum Recall		No				No	No	No			No	
Pedestrian Recall		No				No	No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	R	L	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	6	6	47	37	37
g / C, Green / Cycle	0.34	0.34	0.34	0.07	0.07	0.52	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.27	0.27	0.26	0.02	0.05	0.27	0.22	0.22
s, saturation flow rate [veh/h]	3500	1800	1900	3800	1800	5700	5700	1900
c, Capacity [veh/h]	1201	618	652	257	122	2978	2340	780
d1, Uniform Delay [s]	26.82	26.83	26.30	40.09	41.39	14.15	19.96	19.96
k, delay calibration	0.11	0.16	0.14	0.11	0.11	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.28	3.61	2.32	0.73	10.32	0.66	0.84	2.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.80	0.76	0.33	0.78	0.52	0.52	0.52
d, Delay for Lane Group [s/veh]	28.09	30.43	28.63	40.82	51.71	14.82	20.81	22.48
Lane Group LOS	C	C	C	D	D	B	C	C
Critical Lane Group	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	9.19	9.87	9.49	0.90	2.40	6.66	6.35	6.72
50th-Percentile Queue Length [ft/ln]	229.68	246.64	237.16	22.62	60.02	166.56	158.87	167.91
95th-Percentile Queue Length [veh/ln]	14.16	15.02	14.54	1.63	4.32	10.90	10.49	10.97
95th-Percentile Queue Length [ft/ln]	353.95	375.41	363.45	40.72	108.04	272.39	262.22	274.16

Movement, Approach, & Intersection Results

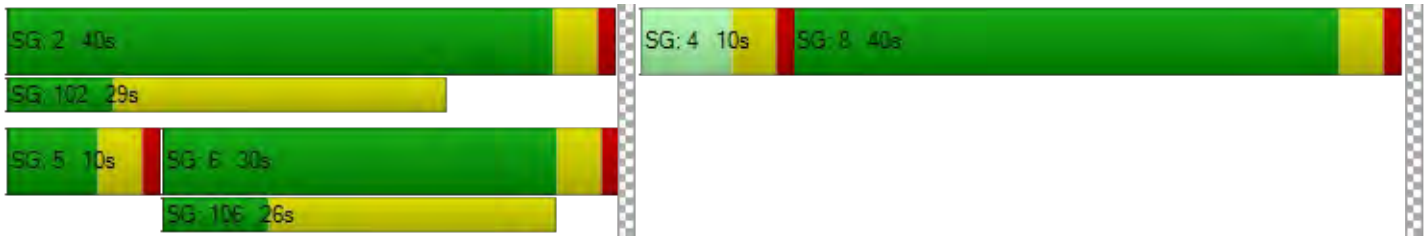
d_M, Delay for Movement [s/veh]	28.34	30.43	29.37	0.00	0.00	40.82	51.71	14.82	0.00	0.00	21.21	22.48
Movement LOS	C	C	C			D	D	B			C	C
d_A, Approach Delay [s/veh]	28.82			40.82			16.93			21.22		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	22.98											
Intersection LOS	C											
Intersection V/C	0.633											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.680	2.185	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	133	800	578
d_b, Bicycle Delay [s]	16.20	39.20	16.20	22.76
l_b,int, Bicycle LOS Score for Intersection	4.777	1.560	2.470	2.234
Bicycle LOS	E	A	B	B

Sequence

Ring 1	-	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	25.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.738

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	2	82	15	8	2	1	238	80	93	204	3
Total Analysis Volume [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	50	0	0	37	0	10	38	0	17	45	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	21	21	8	8	0	60	60	13	72	72
g / C, Green / Cycle	0.09	0.20	0.20	0.07	0.07	0.00	0.57	0.57	0.12	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.07	0.00	0.17	0.03	0.02	0.00	0.35	0.32	0.11	0.22	0.22
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	1900	1900	3500	1900	1900
c, Capacity [veh/h]	302	373	373	163	136	8	1076	1076	433	1302	1302
d1, Uniform Delay [s]	47.26	34.07	41.02	46.80	46.22	52.16	15.18	14.57	45.14	6.65	6.64
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.84	0.02	6.66	1.32	1.10	16.15	2.63	2.17	4.94	0.64	0.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.02	0.88	0.36	0.28	0.25	0.61	0.57	0.86	0.32	0.32
d, Delay for Lane Group [s/veh]	53.10	34.09	47.68	48.12	47.32	68.31	17.81	16.74	50.09	7.29	7.28
Lane Group LOS	D	C	D	D	D	E	B	B	D	A	A
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.46	0.13	8.82	1.51	0.98	0.09	10.68	9.41	4.99	3.55	3.52
50th-Percentile Queue Length [ft/ln]	86.53	3.14	220.55	37.77	24.51	2.19	266.94	235.25	124.83	88.63	88.12
95th-Percentile Queue Length [veh/ln]	6.23	0.23	13.69	2.72	1.76	0.16	16.04	14.44	8.66	6.38	6.34
95th-Percentile Queue Length [ft/ln]	155.75	5.66	342.33	67.98	44.12	3.94	400.91	361.02	216.45	159.53	158.61

Movement, Approach, & Intersection Results

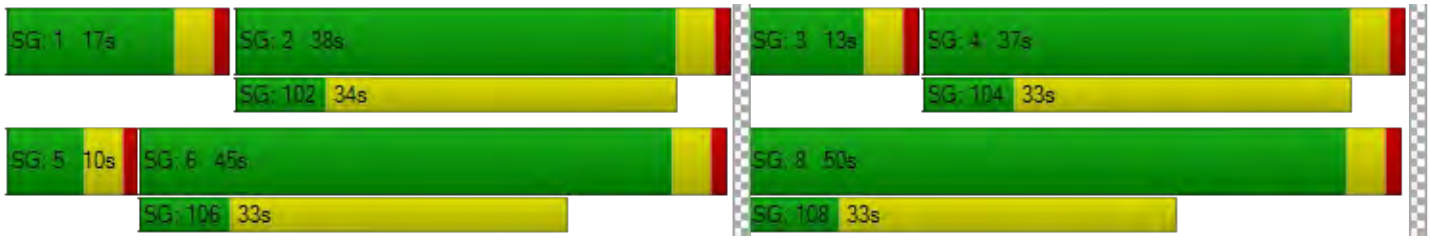
d_M, Delay for Movement [s/veh]	53.10	34.09	47.68	48.12	47.32	47.32	68.31	17.48	16.74	50.09	7.29	7.28
Movement LOS	D	C	D	D	D	D	E	B	B	D	A	A
d_A, Approach Delay [s/veh]	49.87			47.80			17.38			20.54		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	25.53											
Intersection LOS	C											
Intersection V/C	0.738											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
l_p,int, Pedestrian LOS Score for Intersection	2.672	1.985	2.765	2.954
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	876	629	648	781
d_b, Bicycle Delay [s]	16.58	24.69	24.00	19.50
l_b,int, Bicycle LOS Score for Intersection	2.523	1.718	2.610	2.545
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: S.Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	6.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.209

Intersection Setup

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Base Volume Input [veh/h]	127	420	16	20	491	29	20	1	48	44	8	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	127	420	16	20	491	29	20	1	48	44	8	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	105	4	5	123	7	5	0	12	11	2	11
Total Analysis Volume [veh/h]	127	420	16	20	491	29	20	1	48	44	8	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	76	76	76	76	76	6	6
g / C, Green / Cycle	0.84	0.84	0.84	0.84	0.84	0.84	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.07	0.12	0.11	0.01	0.14	0.14	0.04	0.05
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1900	1800	1800
c, Capacity [veh/h]	1494	1600	1600	1503	1600	1600	175	183
d1, Uniform Delay [s]	1.20	1.26	1.26	1.13	1.30	1.29	40.54	41.13
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	0.18	0.18	0.02	0.22	0.22	1.43	2.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.08	0.14	0.14	0.01	0.16	0.16	0.39	0.51
d, Delay for Lane Group [s/veh]	1.32	1.44	1.44	1.15	1.52	1.51	41.97	43.37
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.19	0.34	0.34	0.03	0.42	0.41	1.53	2.14
50th-Percentile Queue Length [ft/ln]	4.75	8.49	8.39	0.70	10.43	10.24	38.32	53.40
95th-Percentile Queue Length [veh/ln]	0.34	0.61	0.60	0.05	0.75	0.74	2.76	3.84
95th-Percentile Queue Length [ft/ln]	8.55	15.28	15.10	1.26	18.78	18.44	68.97	96.11

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.32	1.44	1.44	1.15	1.51	1.51	41.97	41.97	41.97	43.37	43.37	43.37
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.41			1.50			41.97			43.37		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.78											
Intersection LOS	A											
Intersection V/C	0.209											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.585	2.527	2.009	1.807
Crosswalk LOS	B	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	444	444	1378	1378
d_b, Bicycle Delay [s]	27.22	27.22	4.36	4.36
l_b,int, Bicycle LOS Score for Intersection	2.024	2.005	1.673	1.715
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	30.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.804

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	150	218	93	162	347	161	214	2166	106	96	1789	98
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	218	93	162	347	161	214	2166	106	96	1789	98
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	55	23	41	87	40	54	542	27	24	447	25
Total Analysis Volume [veh/h]	150	218	93	162	347	161	214	2166	106	96	1789	98
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	39	0	16	45	0	19	44	0	11	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	29	0	0	26	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	22	22	7	23	23	15	58	58	7	50	50
g / C, Green / Cycle	0.05	0.20	0.20	0.07	0.21	0.21	0.14	0.53	0.53	0.06	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.04	0.08	0.08	0.05	0.18	0.08	0.12	0.39	0.41	0.05	0.24	0.26
s, saturation flow rate [veh/h]	3500	1900	1900	3500	1900	1900	1800	3800	1900	1800	5700	1900
c, Capacity [veh/h]	194	374	374	229	393	393	244	2007	1003	116	2605	868
d1, Uniform Delay [s]	51.33	38.82	38.56	50.41	42.37	37.84	46.70	20.22	20.72	50.90	21.47	21.93
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.48	0.79	0.69	3.98	6.64	0.69	9.74	2.57	5.80	13.74	0.79	2.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.43	0.40	0.71	0.88	0.41	0.88	0.75	0.77	0.83	0.53	0.57
d, Delay for Lane Group [s/veh]	57.80	39.61	39.25	54.40	49.01	38.53	56.44	22.78	26.52	64.64	22.26	24.63
Lane Group LOS	E	D	D	D	D	D	E	C	C	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.21	3.91	3.59	2.31	9.80	3.83	6.38	14.91	16.72	3.05	8.60	9.79
50th-Percentile Queue Length [ft/ln]	55.30	97.67	89.79	57.73	244.93	95.85	159.51	372.85	418.03	76.29	215.00	244.71
95th-Percentile Queue Length [veh/ln]	3.98	7.03	6.46	4.16	14.93	6.90	10.52	21.25	23.43	5.49	13.41	14.92
95th-Percentile Queue Length [ft/ln]	99.54	175.80	161.62	103.91	373.27	172.53	263.07	531.19	585.68	137.31	335.23	372.98

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	57.80	39.52	39.25	54.40	49.01	38.53	56.44	23.94	26.52	64.64	22.79	24.63
Movement LOS	E	D	D	D	D	D	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	45.41			47.79			26.85			24.90		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	30.19											
Intersection LOS	C											
Intersection V/C	0.804											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
l_p,int, Pedestrian LOS Score for Intersection	2.627	2.657	3.294	3.272
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	636	745	727	582
d_b, Bicycle Delay [s]	25.57	21.64	22.27	27.65
l_b,int, Bicycle LOS Score for Intersection	1.940	2.665	2.927	2.378
Bicycle LOS	A	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report

Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	17.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.687

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	191	12	149	26	29	14	14	2009	479	201	1649	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	191	12	149	26	29	14	14	2009	479	201	1649	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	3	37	7	7	4	4	502	120	50	412	9
Total Analysis Volume [veh/h]	191	12	149	26	29	14	14	2009	479	201	1649	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	26	0	0	10	0	10	32	0	22	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	10	5	5	2	47	47	12	58	58
g / C, Green / Cycle	0.11	0.11	0.11	0.06	0.06	0.02	0.53	0.53	0.13	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.05	0.06	0.08	0.01	0.02	0.01	0.35	0.25	0.11	0.29	0.30
s, saturation flow rate [veh/h]	1800	1800	1900	1800	1900	1800	5700	1900	1800	3800	1900
c, Capacity [veh/h]	193	193	204	101	106	38	2993	998	241	2425	1213
d1, Uniform Delay [s]	38.01	38.15	38.99	40.77	41.11	43.55	15.70	13.60	38.05	8.33	8.47
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.08	2.35	4.98	1.33	2.45	5.86	1.22	1.65	7.30	0.62	1.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.51	0.54	0.73	0.26	0.40	0.37	0.67	0.48	0.83	0.46	0.48
d, Delay for Lane Group [s/veh]	40.09	40.50	43.97	42.10	43.56	49.41	16.92	15.25	45.35	8.95	9.81
Lane Group LOS	D	D	D	D	D	D	B	B	D	A	A
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.14	2.29	3.43	0.58	0.99	0.37	9.61	6.20	4.74	5.00	5.52
50th-Percentile Queue Length [ft/ln]	53.49	57.14	85.73	14.62	24.64	9.18	240.21	155.00	118.58	125.01	137.98
95th-Percentile Queue Length [veh/ln]	3.85	4.11	6.17	1.05	1.77	0.66	14.69	10.28	8.31	8.67	9.37
95th-Percentile Queue Length [ft/ln]	96.29	102.85	154.31	26.32	44.35	16.52	367.30	257.09	207.87	216.69	234.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.29	40.50	43.97	42.10	43.56	43.56	49.41	16.92	15.25	45.35	9.23	9.81
Movement LOS	D	D	D	D	D	D	D	B	B	D	A	A
d_A, Approach Delay [s/veh]	41.85			43.01			16.78			13.10		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	17.55											
Intersection LOS	B											
Intersection V/C	0.687											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.506	1.982	0.000	3.160
Crosswalk LOS	B	A	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	133	622	889
d_b, Bicycle Delay [s]	25.69	39.20	21.36	13.89
l_b,int, Bicycle LOS Score for Intersection	2.140	1.673	2.936	2.596
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 7: S. Associated Road at Brea Plaza Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.018

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Base Volume Input [veh/h]	0	531	652	3	0	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	531	652	3	0	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	133	163	1	0	3
Total Analysis Volume [veh/h]	0	531	652	3	0	12
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.49
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.05
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	1.37
d_A, Approach Delay [s/veh]	0.00		0.00		10.49	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.11					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Control Type:	Two-way stop	Delay (sec / veh):	19.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.069

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Base Volume Input [veh/h]	12	517	645	19	18	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	517	645	19	18	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	129	161	5	5	6
Total Analysis Volume [veh/h]	12	517	645	19	18	24
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.07	0.04
d_M, Delay for Movement [s/veh]	8.96	0.00	0.00	0.00	19.88	10.63
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.04	0.00	0.00	0.00	0.22	0.11
95th-Percentile Queue Length [ft/ln]	0.99	0.00	0.00	0.00	5.54	2.81
d_A, Approach Delay [s/veh]	0.20		0.00		14.59	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.58					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 9: Brea Plaza Dwy 4 at Imperial Highway

Control Type:	Two-way stop	Delay (sec / veh):	24.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.047

Intersection Setup

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Base Volume Input [veh/h]	0	9	0	2486	2091	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	9	0	2486	2091	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	0	622	523	3
Total Analysis Volume [veh/h]	0	9	0	2486	2091	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.05	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	24.68	0.00	0.00	0.00	0.00
Movement LOS		C		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.15	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	3.67	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	24.68		0.00		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.05					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 1: SR-57 SB Ramps at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	16.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.751

Intersection Setup

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			Yes			No			No		

Volumes

Name				SR-57 SB Ramps			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	0	0	0	681	0	601	0	1870	1104	0	2547	403
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	681	0	601	0	1870	1104	0	2547	403
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	170	0	150	0	468	276	0	637	101
Total Analysis Volume [veh/h]	0	0	0	681	0	601	0	1870	1104	0	2547	403
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing m		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna
Signal Group	0	0	0	7	0	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	0	6	0	0	6	0
Maximum Green [s]	0	0	0	30	0	0	0	30	0	0	30	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	64	0	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall				No				No			No	
Maximum Recall				No				No			No	
Pedestrian Recall				No				No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	C	R	C	C
C, Cycle Length [s]		90	90	90	90	90
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		26	26	26	56	56
g / C, Green / Cycle		0.29	0.29	0.29	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate		0.24	0.24	0.22	0.33	0.45
s, saturation flow rate [veh/h]		1800	1800	1900	5700	5700
c, Capacity [veh/h]		514	514	543	3563	3563
d1, Uniform Delay [s]		30.04	30.04	29.56	9.39	11.41
k, delay calibration		0.11	0.11	0.11	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.55	3.55	2.58	0.56	1.25
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.83	0.83	0.79	0.52	0.71
d, Delay for Lane Group [s/veh]		33.59	33.59	32.14	9.95	12.66
Lane Group LOS		C	C	C	A	B
Critical Lane Group		Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.88	8.88	8.63	6.20	10.38
50th-Percentile Queue Length [ft/ln]		221.96	221.96	215.63	155.12	259.38
95th-Percentile Queue Length [veh/ln]		13.76	13.76	13.44	10.29	15.66
95th-Percentile Queue Length [ft/ln]		344.12	344.12	336.05	257.24	391.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	33.59	0.00	32.56	0.00	9.95	0.00	0.00	12.66	0.00
Movement LOS				C		C		A			B	
d_A, Approach Delay [s/veh]	0.00			33.10			9.95			12.66		
Approach LOS	A			C			A			B		
d_I, Intersection Delay [s/veh]	16.37											
Intersection LOS	B											
Intersection V/C	0.751											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	34.67	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.443	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1333	489	489
d_b, Bicycle Delay [s]	45.00	5.00	25.69	25.69
l_b,int, Bicycle LOS Score for Intersection	4.132	3.675	2.588	2.960
Bicycle LOS	D	D	B	C

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: SR-57 NB Ramps/Brea Plaza Dwy 1 at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	26.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.765

Intersection Setup

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	SR-57 NB Ramps			Brea Plaza Dwy 1			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	1144	62	434	0	0	184	175	1808	390	0	2549	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1144	62	434	0	0	184	175	1808	390	0	2549	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	286	16	109	0	0	46	44	452	98	0	637	9
Total Analysis Volume [veh/h]	1144	62	434	0	0	184	175	1808	390	0	2549	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Permiss	Overlap	Protecte	Permiss	Unsigna	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	0	5	5	2	0	0	6	0
Auxiliary Signal Groups						5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	6	6	6	0	0	6	0
Maximum Green [s]	0	30	0	0	0	30	30	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	35	0	0	0	20	20	50	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	22	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No		No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No	No	No			No	
Maximum Recall		No				No	No	No			No	
Pedestrian Recall		No				No	No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	R	L	C	C	C
C, Cycle Length [s]	95	95	95	95	95	95	95	95
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27	11	11	56	40	40
g / C, Green / Cycle	0.29	0.29	0.29	0.12	0.12	0.59	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.23	0.23	0.22	0.05	0.10	0.32	0.34	0.34
s, saturation flow rate [veh/h]	3500	1800	1900	3800	1800	5700	5700	1900
c, Capacity [veh/h]	999	514	542	457	217	3347	2422	807
d1, Uniform Delay [s]	31.59	31.60	31.11	38.69	40.78	11.87	23.86	23.86
k, delay calibration	0.11	0.16	0.14	0.11	0.11	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.62	4.55	2.92	0.57	6.99	0.63	2.90	8.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.81	0.77	0.40	0.81	0.54	0.80	0.80
d, Delay for Lane Group [s/veh]	33.20	36.15	34.03	39.26	47.77	12.50	26.75	32.07
Lane Group LOS	C	D	C	D	D	B	C	C
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.62	9.30	8.96	2.00	4.37	7.26	12.69	13.88
50th-Percentile Queue Length [ft/ln]	215.49	232.49	223.88	50.12	109.19	181.56	317.15	346.97
95th-Percentile Queue Length [veh/ln]	13.43	14.30	13.86	3.61	7.79	11.68	18.53	19.99
95th-Percentile Queue Length [ft/ln]	335.87	357.52	346.57	90.22	194.87	292.05	463.18	499.71

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.05	36.15	34.15	0.00	0.00	39.26	47.77	12.50	0.00	0.00	28.02	32.07
Movement LOS	C	D	C			D	D	B			C	C
d_A, Approach Delay [s/veh]	34.16			39.26			15.61			28.08		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	26.10											
Intersection LOS	C											
Intersection V/C	0.765											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	37.14	37.14	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.622	2.245	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	653	337	968	547
d_b, Bicycle Delay [s]	21.56	32.85	12.64	25.06
l_b,int, Bicycle LOS Score for Intersection	4.266	1.560	2.650	2.626
Bicycle LOS	E	A	B	B

Sequence

Ring 1	-	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	121	9	92	3	5	2	3	222	75	75	312	4
Total Analysis Volume [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	24	61	0	0	37	0	10	38	0	16	44	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	26	26	4	4	2	65	65	12	75	75
g / C, Green / Cycle	0.16	0.23	0.23	0.04	0.04	0.02	0.57	0.57	0.10	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.14	0.02	0.19	0.01	0.01	0.01	0.33	0.30	0.09	0.33	0.33
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	1900	1900	3500	1900	1900
c, Capacity [veh/h]	548	434	434	76	71	31	1074	1074	358	1235	1235
d1, Uniform Delay [s]	47.48	34.87	42.45	53.65	54.09	55.94	16.14	15.53	50.71	10.56	10.54
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.87	0.08	4.61	0.86	3.37	7.82	2.26	1.88	5.28	1.52	1.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.08	0.85	0.14	0.38	0.39	0.58	0.53	0.84	0.51	0.51
d, Delay for Lane Group [s/veh]	52.35	34.95	47.06	54.51	57.47	63.76	18.40	17.41	56.00	12.08	12.06
Lane Group LOS	D	C	D	D	E	E	B	B	E	B	B
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.11	0.76	10.46	0.33	0.83	0.41	10.78	9.50	4.50	8.38	8.35
50th-Percentile Queue Length [ft/ln]	177.86	19.08	261.58	8.17	20.75	10.29	269.50	237.50	112.40	209.60	208.65
95th-Percentile Queue Length [veh/ln]	11.49	1.37	15.77	0.59	1.49	0.74	16.16	14.55	7.97	13.13	13.08
95th-Percentile Queue Length [ft/ln]	287.21	34.35	394.20	14.71	37.35	18.52	404.11	363.87	199.34	328.32	327.09

Movement, Approach, & Intersection Results

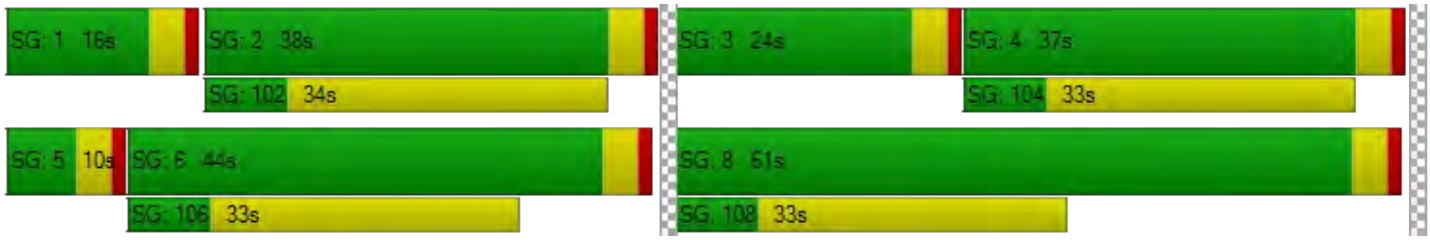
d_M, Delay for Movement [s/veh]	52.35	34.95	47.06	54.51	57.47	57.47	63.76	18.10	17.41	56.00	12.07	12.06
Movement LOS	D	C	D	D	E	E	E	B	B	E	B	B
d_A, Approach Delay [s/veh]	49.49			56.61			18.38			20.49		
Approach LOS	D			E			B			C		
d_I, Intersection Delay [s/veh]	27.13											
Intersection LOS	C											
Intersection V/C	0.703											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.03	47.03	47.03	47.03
l_p,int, Pedestrian LOS Score for Intersection	2.709	1.985	2.884	2.940
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	991	574	591	696
d_b, Bicycle Delay [s]	14.63	29.23	28.53	24.46
l_b,int, Bicycle LOS Score for Intersection	3.018	1.622	2.550	2.851
Bicycle LOS	C	A	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: S.Associated Road at Greenbriar Lane

Control Type:	Signalized	Delay (sec / veh):	7.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.265

Intersection Setup

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Greenbriar Lane			Greenbriar Lane		
Base Volume Input [veh/h]	56	556	39	17	577	19	41	9	99	28	4	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	556	39	17	577	19	41	9	99	28	4	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	139	10	4	144	5	10	2	25	7	1	9
Total Analysis Volume [veh/h]	56	556	39	17	577	19	41	9	99	28	4	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	73	73	73	73	73	73	9	9
g / C, Green / Cycle	0.81	0.81	0.81	0.81	0.81	0.81	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.03	0.16	0.15	0.01	0.16	0.16	0.08	0.04
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1900	1800	1800
c, Capacity [veh/h]	1401	1532	1532	1401	1532	1532	239	244
d1, Uniform Delay [s]	1.74	2.00	1.99	1.70	2.00	1.99	39.28	37.46
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.29	0.28	0.02	0.29	0.28	2.65	0.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.20	0.19	0.01	0.20	0.19	0.62	0.28
d, Delay for Lane Group [s/veh]	1.79	2.28	2.27	1.71	2.28	2.27	41.93	38.09
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.13	0.82	0.80	0.04	0.81	0.80	3.34	1.44
50th-Percentile Queue Length [ft/ln]	3.33	20.38	19.88	0.99	20.29	20.05	83.55	36.02
95th-Percentile Queue Length [veh/ln]	0.24	1.47	1.43	0.07	1.46	1.44	6.02	2.59
95th-Percentile Queue Length [ft/ln]	5.99	36.68	35.79	1.78	36.52	36.10	150.38	64.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.79	2.28	2.27	1.71	2.28	2.27	41.93	41.93	41.93	38.09	38.09	38.09
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.23			2.26			41.93			38.09		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	7.91											
Intersection LOS	A											
Intersection V/C	0.265											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.603	2.601	1.905	1.804
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	444	444	1378	1378
d_b, Bicycle Delay [s]	27.22	27.22	4.36	4.36
l_b,int, Bicycle LOS Score for Intersection	2.097	2.065	1.805	1.673
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: S. Associated Road at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	40.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.847

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Imperial Highway			Imperial Highway		
Base Volume Input [veh/h]	227	272	103	294	363	260	272	1882	146	210	1941	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	227	272	103	294	363	260	272	1882	146	210	1941	181
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	68	26	74	91	65	68	471	37	53	485	45
Total Analysis Volume [veh/h]	227	272	103	294	363	260	272	1882	146	210	1941	181
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	39	0	15	41	0	24	47	0	19	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	29	0	0	26	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	24	24	11	26	26	20	54	54	15	49	49
g / C, Green / Cycle	0.08	0.20	0.20	0.09	0.21	0.21	0.17	0.45	0.45	0.13	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.06	0.10	0.09	0.08	0.19	0.14	0.15	0.35	0.36	0.12	0.28	0.29
s, saturation flow rate [veh/h]	3500	1900	1900	3500	1900	1900	1800	3800	1900	1800	5700	1900
c, Capacity [veh/h]	265	375	375	323	407	407	298	1716	858	226	2345	782
d1, Uniform Delay [s]	54.85	43.10	42.71	54.00	45.85	42.97	49.22	27.89	28.27	51.98	28.74	29.21
k, delay calibration	0.11	0.11	0.11	0.11	0.18	0.11	0.16	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.87	1.12	0.95	9.86	10.80	1.68	14.65	3.61	7.75	15.40	1.55	5.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.86	0.52	0.48	0.91	0.89	0.64	0.91	0.78	0.80	0.93	0.67	0.70
d, Delay for Lane Group [s/veh]	62.72	44.22	43.66	63.87	56.65	44.65	63.87	31.50	36.02	67.38	30.29	34.39
Lane Group LOS	E	D	D	E	E	D	E	C	D	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.68	5.31	4.84	4.84	11.69	7.22	9.20	16.79	18.40	7.21	12.46	13.98
50th-Percentile Queue Length [ft/ln]	92.03	132.85	120.99	120.95	292.16	180.40	230.11	419.87	459.96	180.36	311.62	349.57
95th-Percentile Queue Length [veh/ln]	6.63	9.09	8.45	8.45	17.29	11.62	14.18	23.52	25.43	11.62	18.25	20.12
95th-Percentile Queue Length [ft/ln]	165.65	227.36	211.18	211.14	432.32	290.53	354.50	587.89	635.82	290.48	456.37	502.88

Movement, Approach, & Intersection Results

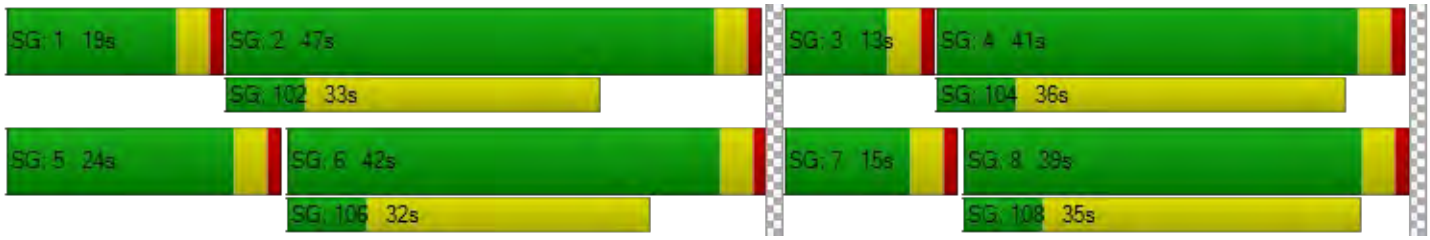
d_M, Delay for Movement [s/veh]	62.72	44.06	43.66	63.87	56.65	44.65	63.87	32.80	36.02	67.38	31.06	34.39
Movement LOS	E	D	D	E	E	D	E	C	D	E	C	C
d_A, Approach Delay [s/veh]	51.03			55.56			36.68			34.59		
Approach LOS	D			E			D			C		
d_I, Intersection Delay [s/veh]	40.11											
Intersection LOS	D											
Intersection V/C	0.847											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	2.681	2.733	3.315	3.301
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	617	717	633
d_b, Bicycle Delay [s]	30.10	28.70	24.70	28.02
l_b,int, Bicycle LOS Score for Intersection	2.056	3.073	2.825	2.522
Bicycle LOS	B	C	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Placentia Avenue/Castlegate Lane at Imperial Highway

Control Type:	Signalized	Delay (sec / veh):	23.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.769

Intersection Setup

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Placentia Ave			Castlegate Ln			Imperial Hwy			Imperial Hwy		
Base Volume Input [veh/h]	272	48	277	26	24	14	20	1909	291	237	2114	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	272	48	277	26	24	14	20	1909	291	237	2114	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	12	69	7	6	4	5	477	73	59	529	15
Total Analysis Volume [veh/h]	272	48	277	26	24	14	20	1909	291	237	2114	59
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	26	0	0	10	0	10	32	0	22	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	5	5	2	40	40	14	51	51
g / C, Green / Cycle	0.18	0.18	0.18	0.05	0.05	0.03	0.44	0.44	0.15	0.57	0.57
(v / s)_i Volume / Saturation Flow Rate	0.09	0.09	0.15	0.01	0.02	0.01	0.33	0.15	0.13	0.38	0.39
s, saturation flow rate [veh/h]	1800	1800	1900	1800	1900	1800	5700	1900	1800	3800	1900
c, Capacity [veh/h]	316	316	334	98	104	50	2499	833	277	2146	1073
d1, Uniform Delay [s]	33.51	33.74	35.86	40.90	41.13	43.11	21.39	16.80	37.16	13.69	14.05
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.17	1.34	5.31	1.42	2.16	5.15	2.28	1.16	7.41	1.65	3.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.52	0.83	0.27	0.37	0.40	0.76	0.35	0.85	0.67	0.69
d, Delay for Lane Group [s/veh]	34.68	35.07	41.17	42.33	43.30	48.26	23.67	17.95	44.57	15.34	17.75
Lane Group LOS	C	D	D	D	D	D	C	B	D	B	B
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.10	3.35	6.25	0.59	0.87	0.51	11.19	4.10	5.57	9.63	10.87
50th-Percentile Queue Length [ft/ln]	77.60	83.73	156.15	14.68	21.71	12.63	279.78	102.43	139.15	240.66	271.70
95th-Percentile Queue Length [veh/ln]	5.59	6.03	10.34	1.06	1.56	0.91	16.68	7.37	9.43	14.71	16.27
95th-Percentile Queue Length [ft/ln]	139.69	150.71	258.62	26.43	39.08	22.74	416.94	184.37	235.87	367.87	406.86

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.85	35.07	41.17	42.33	43.30	43.30	48.26	23.67	17.95	44.57	16.12	17.75
Movement LOS	C	D	D	D	D	D	D	C	B	D	B	B
d_A, Approach Delay [s/veh]	37.80			42.90			23.14			18.96		
Approach LOS	D			D			C			B		
d_I, Intersection Delay [s/veh]	23.13											
Intersection LOS	C											
Intersection V/C	0.769											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.523	2.002	0.000	3.237
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	133	622	889
d_b, Bicycle Delay [s]	25.69	39.20	21.36	13.89
l_b,int, Bicycle LOS Score for Intersection	2.545	1.665	2.781	2.885
Bicycle LOS	B	A	C	C

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 7: S. Associated Road at Brea Plaza Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	11.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 2	
Base Volume Input [veh/h]	0	745	827	5	0	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	745	827	5	0	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	186	207	1	0	1
Total Analysis Volume [veh/h]	0	745	827	5	0	4
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.19
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.02
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.52
d_A, Approach Delay [s/veh]	0.00		0.00		11.19	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.03					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Control Type:	Two-way stop	Delay (sec / veh):	31.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.209

Intersection Setup

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	S. Associated Rd		S. Associated Rd		Brea Plaza Dwy 3	
Base Volume Input [veh/h]	18	707	798	34	36	117
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	707	798	34	36	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	177	200	9	9	29
Total Analysis Volume [veh/h]	18	707	798	34	36	117
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.01	0.00	0.21	0.20
d_M, Delay for Movement [s/veh]	9.63	0.00	0.00	0.00	31.29	12.68
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	0.07	0.00	0.00	0.00	0.76	0.74
95th-Percentile Queue Length [ft/ln]	1.73	0.00	0.00	0.00	18.94	18.50
d_A, Approach Delay [s/veh]	0.24		0.00		17.06	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.63					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 9: Brea Plaza Dwy 4 at Imperial Highway

Control Type:	Two-way stop	Delay (sec / veh):	38.7
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.289

Intersection Setup

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Brea Plaza Dwy 4		Imperial Hwy		Imperial Hwy	
Base Volume Input [veh/h]	0	43	0	2300	2400	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	43	0	2300	2400	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	11	0	575	600	8
Total Analysis Volume [veh/h]	0	43	0	2300	2400	30
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.29	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	38.75	0.00	0.00	0.00	0.00
Movement LOS		E		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.12	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	28.10	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	38.75		0.00		0.00	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	0.35					
Intersection LOS	E					

APPENDIX E

YEAR 2045 MODELING WORKSHEETS

1. SR-57 SB Ramps at Imperial Highway

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	603
SOUTH BOUND	LEFT	558	SOUTHBOUND	
	THRU	0	IN ...	1134
	RIGHT	445	OUT ...	174
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	1366	IN ...	2318
	RIGHT	619	OUT ...	2300
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	1589	IN ...	1895
	RIGHT	174	OUT ...	2269

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
SOUTH BOUND	LEFT	558	606
	THRU	0	0
	RIGHT	445	562
EAST BOUND	LEFT	0	0
	THRU	1,366	1,696
	RIGHT	619	836
WEST BOUND	LEFT	0	0
	THRU	1,589	2,017
	RIGHT	174	189

2. SR-57 NB Ramps/Brea Plaza at Imperial Highway

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	803	NORTHBOUND	
	THRU	43	IN ...	1593
	RIGHT	761	OUT ...	515
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	50
	RIGHT	50	OUT ...	177
EAST BOUND	LEFT	116	EASTBOUND	
	THRU	1241	IN ...	2150
	RIGHT	515	OUT ...	2407
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	1355	IN ...	1636
	RIGHT	18	OUT ...	2331

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	803	1,089
	THRU	43	46
	RIGHT	761	811
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	50	56
EAST BOUND	LEFT	116	127
	THRU	1,241	1,520
	RIGHT	515	575
WEST BOUND	LEFT	0	0
	THRU	1,355	1,613
	RIGHT	18	21

3. S.Associated Road at Birch Street

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	228	NORTHBOUND	
	THRU	6	IN ...	527
	RIGHT	298	OUT ...	539
SOUTH BOUND	LEFT	53	SOUTHBOUND	
	THRU	28	IN ...	89
	RIGHT	8	OUT ...	18
EAST BOUND	LEFT	2	EASTBOUND	
	THRU	883	IN ...	1,178
	RIGHT	294	OUT ...	1,030
WEST BOUND	LEFT	332	WESTBOUND	
	THRU	724	IN ...	1,102
	RIGHT	10	OUT ...	1,309

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	228	247
	THRU	6	6
	RIGHT	298	322
SOUTH BOUND	LEFT	53	58
	THRU	28	30
	RIGHT	8	8
EAST BOUND	LEFT	2	2
	THRU	883	947
	RIGHT	294	318
WEST BOUND	LEFT	332	359
	THRU	724	804
	RIGHT	10	11

4. S.Associated Road at Greenbriar Lane

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	22	NORTHBOUND	
	THRU	381	IN ...	342
	RIGHT	14	OUT ...	347
SOUTH BOUND	LEFT	18	SOUTHBOUND	
	THRU	447	IN ...	355
	RIGHT	5	OUT ...	419
EAST BOUND	LEFT	4	EASTBOUND	
	THRU	1	IN ...	34
	RIGHT	26	OUT ...	23
WEST BOUND	LEFT	40	WESTBOUND	
	THRU	8	IN ...	37
	RIGHT	39	OUT ...	-22

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	22	41
	THRU	381	412
	RIGHT	14	16
SOUTH BOUND	LEFT	18	20
	THRU	447	483
	RIGHT	5	14
EAST BOUND	LEFT	4	17
	THRU	1	1
	RIGHT	26	34
WEST BOUND	LEFT	40	44
	THRU	8	8
	RIGHT	39	42

5. S.Associated Road at Imperial Highway

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	140	NORTHBOUND	
	THRU	198	IN ...	410
	RIGHT	68	OUT ...	341
SOUTH BOUND	LEFT	142	SOUTHBOUND	
	THRU	314	IN ...	429
	RIGHT	139	OUT ...	345
EAST BOUND	LEFT	142	EASTBOUND	
	THRU	1758	IN ...	2,324
	RIGHT	95	OUT ...	2,047
WEST BOUND	LEFT	88	WESTBOUND	
	THRU	1505	IN ...	1,966
	RIGHT	80	OUT ...	2,396

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	140	150
	THRU	198	214
	RIGHT	68	94
SOUTH BOUND	LEFT	142	153
	THRU	314	339
	RIGHT	139	153
EAST BOUND	LEFT	142	154
	THRU	1,758	2,165
	RIGHT	95	106
WEST BOUND	LEFT	88	96
	THRU	1,505	1,792
	RIGHT	80	86

6. Placentia Avenue at Imperial Highway

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	163	NORTHBOUND	
	THRU	11	IN ...	335
	RIGHT	138	OUT ...	708
SOUTH BOUND	LEFT	24	SOUTHBOUND	
	THRU	27	IN ...	64
	RIGHT	13	OUT ...	54
EAST BOUND	LEFT	12	EASTBOUND	
	THRU	1721	IN ...	2,500
	RIGHT	339	OUT ...	1,846
WEST BOUND	LEFT	167	WESTBOUND	
	THRU	1377	IN ...	1,862
	RIGHT	31	OUT ...	2,154

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	163	191
	THRU	11	12
	RIGHT	138	149
SOUTH BOUND	LEFT	24	26
	THRU	27	29
	RIGHT	13	14
EAST BOUND	LEFT	12	14
	THRU	1,721	1,999
	RIGHT	339	478
WEST BOUND	LEFT	167	201
	THRU	1,377	1,641
	RIGHT	31	34

1. SR-57 SB Ramps at Imperial Highway

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	821
SOUTH BOUND	LEFT	632	SOUTHBOUND	
	THRU	0	IN ...	1191
	RIGHT	502	OUT ...	375
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	1567	IN ...	2739
	RIGHT	862	OUT ...	2943
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	2079	IN ...	2686
	RIGHT	375	OUT ...	2476

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
SOUTH BOUND	LEFT	632	686
	THRU	0	0
	RIGHT	502	601
EAST BOUND	LEFT	0	0
	THRU	1,567	1,886
	RIGHT	862	1,104
WEST BOUND	LEFT	0	0
	THRU	2,079	2,564
	RIGHT	375	407

2. SR-57 NB Ramps/Brea Plaza at Imperial Highway

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	848	NORTHBOUND	
	THRU	72	IN ...	1316
	RIGHT	397	OUT ...	345
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	231
	RIGHT	231	OUT ...	324
EAST BOUND	LEFT	206	EASTBOUND	
	THRU	1670	IN ...	2367
	RIGHT	345	OUT ...	3639
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	2186	IN ...	2563
	RIGHT	46	OUT ...	2169

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	848	1,143
	THRU	72	78
	RIGHT	397	429
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	231	251
EAST BOUND	LEFT	206	213
	THRU	1,670	1,798
	RIGHT	345	390
WEST BOUND	LEFT	0	0
	THRU	2,186	2,526
	RIGHT	46	49

3. S.Associated Road at Birch Street

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	447	NORTHBOUND	
	THRU	31	IN ...	807
	RIGHT	333	OUT ...	531
SOUTH BOUND	LEFT	10	SOUTHBOUND	
	THRU	19	IN ...	35
	RIGHT	6	OUT ...	59
EAST BOUND	LEFT	12	EASTBOUND	
	THRU	828	IN ...	1,145
	RIGHT	278	OUT ...	1,684
WEST BOUND	LEFT	275	WESTBOUND	
	THRU	1176	IN ...	1,518
	RIGHT	16	OUT ...	1,232

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	447	483
	THRU	31	34
	RIGHT	333	360
SOUTH BOUND	LEFT	10	11
	THRU	19	21
	RIGHT	6	6
EAST BOUND	LEFT	12	12
	THRU	828	880
	RIGHT	278	300
WEST BOUND	LEFT	275	297
	THRU	1,176	1,241
	RIGHT	16	17

4. S.Associated Road at Greenbriar Lane

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	34	NORTHBOUND	
	THRU	511	IN ...	481
	RIGHT	35	OUT ...	509
SOUTH BOUND	LEFT	16	SOUTHBOUND	
	THRU	533	IN ...	514
	RIGHT	6	OUT ...	549
EAST BOUND	LEFT	8	EASTBOUND	
	THRU	9	IN ...	27
	RIGHT	17	OUT ...	48
WEST BOUND	LEFT	24	WESTBOUND	
	THRU	4	IN ...	26
	RIGHT	34	OUT ...	-59

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	34	41
	THRU	511	552
	RIGHT	35	39
SOUTH BOUND	LEFT	16	17
	THRU	533	576
	RIGHT	6	16
EAST BOUND	LEFT	8	26
	THRU	9	9
	RIGHT	17	47
WEST BOUND	LEFT	24	28
	THRU	4	4
	RIGHT	34	37

5. S.Associated Road at Imperial Highway

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	205	NORTHBOUND	
	THRU	247	IN ...	531
	RIGHT	80	OUT ...	625
SOUTH BOUND	LEFT	278	SOUTHBOUND	
	THRU	333	IN ...	758
	RIGHT	212	OUT ...	551
EAST BOUND	LEFT	240	EASTBOUND	
	THRU	1697	IN ...	2,171
	RIGHT	132	OUT ...	2,345
WEST BOUND	LEFT	167	WESTBOUND	
	THRU	1597	IN ...	2,330
	RIGHT	163	OUT ...	2,269

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	205	228
	THRU	247	267
	RIGHT	80	103
SOUTH BOUND	LEFT	278	302
	THRU	333	360
	RIGHT	212	234
EAST BOUND	LEFT	240	261
	THRU	1,697	1,878
	RIGHT	132	146
WEST BOUND	LEFT	167	210
	THRU	1,597	1,950
	RIGHT	163	176

6. Placentia Avenue at Imperial Highway

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	224	NORTHBOUND	
	THRU	45	IN ...	596
	RIGHT	253	OUT ...	515
SOUTH BOUND	LEFT	24	SOUTHBOUND	
	THRU	22	IN ...	59
	RIGHT	13	OUT ...	117
EAST BOUND	LEFT	18	EASTBOUND	
	THRU	1713	IN ...	2,208
	RIGHT	263	OUT ...	2,404
WEST BOUND	LEFT	219	WESTBOUND	
	THRU	1764	IN ...	2,383
	RIGHT	54	OUT ...	2,211

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	224	274
	THRU	45	48
	RIGHT	253	277
SOUTH BOUND	LEFT	24	26
	THRU	22	24
	RIGHT	13	14
EAST BOUND	LEFT	18	20
	THRU	1,713	1,910
	RIGHT	263	295
WEST BOUND	LEFT	219	237
	THRU	1,764	2,116
	RIGHT	54	59

APPENDIX F

INTERSECTION QUEUEING WORKSHEETS

APPENDIX F-I

YEAR 2024 CUMULATIVE TRAFFIC CONDITIONS

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	8	0	432	595	11
Future Vol, veh/h	0	8	0	432	595	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	8	0	455	626	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	319	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	677	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	677	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	677	-	-
HCM Lane V/C Ratio	-	0.012	-	-
HCM Control Delay (s)	-	10.4	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

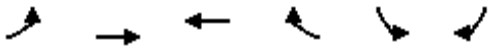
Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	21	11	422	593	10
Future Vol, veh/h	9	21	11	422	593	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	22	12	444	624	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	876	318	635	0	-	0
Stage 1	630	-	-	-	-	-
Stage 2	246	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	288	678	944	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	772	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	284	678	944	-	-	-
Mov Cap-2 Maneuver	284	-	-	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	772	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	0.2	0
HCM LOS	B		

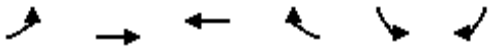
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	944	-	284	678	-	-
HCM Lane V/C Ratio	0.012	-	0.033	0.033	-	-
HCM Control Delay (s)	8.9	-	18.1	10.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-



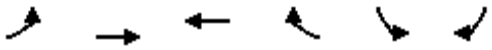
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2110	1906	9	0	9
Future Volume (Veh/h)	0	2110	1906	9	0	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	2221	2006	9	0	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		285	267			
pX, platoon unblocked	0.76				0.87	0.76
vC, conflicting volume	2015				2566	506
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	784				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	634				886	828

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	555	555	555	555	573	573	573	296	9
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	9	9
cSH	1700	1700	1700	1700	1700	1700	1700	1700	828
Volume to Capacity	0.33	0.33	0.33	0.33	0.34	0.34	0.34	0.17	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4
Lane LOS									A
Approach Delay (s)	0.0				0.0				9.4
Approach LOS									A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		



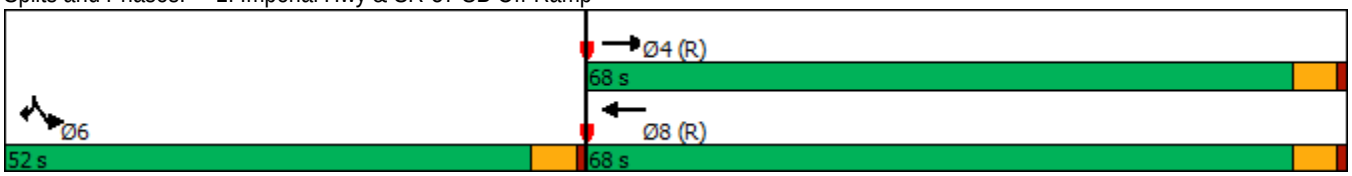
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1479	1921	0	577	501
Future Volume (vph)	0	1479	1921	0	577	501
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	260
Storage Lanes	0			0	2	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.967	0.850
Flt Protected					0.962	
Satd. Flow (prot)	0	5085	5085	0	3362	1441
Flt Permitted					0.962	
Satd. Flow (perm)	0	5085	5085	0	3362	1441
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					5	5
Link Speed (mph)		30	30		30	
Link Distance (ft)		420	362		866	
Travel Time (s)		9.5	8.2		19.7	
Peak Hour Factor	0.93	0.93	0.94	0.94	0.88	0.88
Adj. Flow (vph)	0	1590	2044	0	656	569
Shared Lane Traffic (%)						32%
Lane Group Flow (vph)	0	1590	2044	0	838	387
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		4	8		6	6
Permitted Phases						

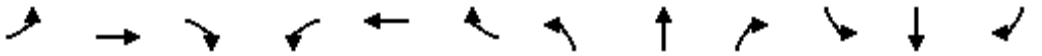


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		6.0	6.0		6.0	6.0
Minimum Split (s)		11.0	27.0		11.0	11.0
Total Split (s)		68.0	68.0		52.0	52.0
Total Split (%)		56.7%	56.7%		43.3%	43.3%
Maximum Green (s)		63.0	63.0		47.0	47.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		Max	Max
Walk Time (s)			7.0			
Flash Dont Walk (s)			15.0			
Pedestrian Calls (#/hr)			5			
Act Effct Green (s)		63.0	63.0		47.0	47.0
Actuated g/C Ratio		0.52	0.52		0.39	0.39
v/c Ratio		0.60	0.77		0.64	0.68
Control Delay		20.9	16.3		32.0	37.3
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		20.9	16.3		32.0	37.3
LOS		C	B		C	D
Approach Delay		20.9	16.3		33.7	
Approach LOS		C	B		C	
Queue Length 50th (ft)		300	418		265	267
Queue Length 95th (ft)		347	501		323	382
Internal Link Dist (ft)		340	282		786	
Turn Bay Length (ft)						260
Base Capacity (vph)		2669	2669		1319	567
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.60	0.77		0.64	0.68

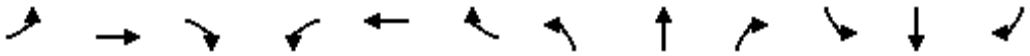
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 49 (41%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 22.2		Intersection LOS: C	
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Imperial Hwy & SR-57 SB Off-Ramp





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	1333	0	0	1474	19	1037	44	784	0	0	53
Future Volume (vph)	121	1333	0	0	1474	19	1037	44	784	0	0	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		350	0		0
Storage Lanes	1		0	0		0	2		1	0		2
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86	0.86	0.91	0.86	0.95	1.00	1.00	0.88
Frt					0.998			0.896	0.850			0.850
Flt Protected	0.950						0.950	0.989				
Satd. Flow (prot)	1770	5085	0	0	6395	0	3221	1420	1504	0	0	2787
Flt Permitted	0.950						0.950	0.989				
Satd. Flow (perm)	1770	5085	0	0	6395	0	3221	1420	1504	0	0	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					2			11	55			64
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		192			285			643			368	
Travel Time (s)		4.4			6.5			14.6			8.4	
Peak Hour Factor	0.88	0.88	0.88	0.89	0.89	0.89	0.91	0.91	0.91	0.68	0.68	0.68
Adj. Flow (vph)	138	1515	0	0	1656	21	1140	48	862	0	0	78
Shared Lane Traffic (%)							10%		42%			
Lane Group Flow (vph)	138	1515	0	0	1677	0	1026	524	500	0	0	78
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			1
Detector Template	Left	Thru			Thru		Left	Thru	Right			Right
Leading Detector (ft)	20	100			100		20	100	20			20
Trailing Detector (ft)	0	0			0		0	0	0			0
Detector 1 Position(ft)	0	0			0		0	0	0			0
Detector 1 Size(ft)	20	6			6		20	6	20			20
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Prot	NA			NA		Split	NA	Prot			Over
Protected Phases	7	4			8		2	2	2			7
Permitted Phases												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4			8		2	2	2			7
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0		6.0	6.0	6.0			6.0
Minimum Split (s)	10.0	34.0			31.0		11.0	11.0	11.0			10.0
Total Split (s)	17.0	59.0			42.0		61.0	61.0	61.0			17.0
Total Split (%)	14.2%	49.2%			35.0%		50.8%	50.8%	50.8%			14.2%
Maximum Green (s)	13.0	54.0			37.0		56.0	56.0	56.0			13.0
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0			3.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0	1.0			1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Total Lost Time (s)	4.0	5.0			5.0		5.0	5.0	5.0			4.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Recall Mode	None	C-Max			C-Max		Max	Max	Max			None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		22.0			19.0							
Pedestrian Calls (#/hr)		5			5							
Act Effct Green (s)	12.3	54.0			37.7		56.0	56.0	56.0			12.3
Actuated g/C Ratio	0.10	0.45			0.31		0.47	0.47	0.47			0.10
v/c Ratio	0.77	0.66			0.83		0.68	0.78	0.68			0.23
Control Delay	70.1	27.4			17.2		28.0	36.4	27.9			17.7
Queue Delay	0.0	0.1			0.0		0.0	0.0	0.0			0.0
Total Delay	70.1	27.5			17.2		28.0	36.4	27.9			17.7
LOS	E	C			B		C	D	C			B
Approach Delay		31.0			17.2			30.1			17.7	
Approach LOS		C			B			C			B	
Queue Length 50th (ft)	108	340			84		333	380	278			5
Queue Length 95th (ft)	#194	401			m118		414	562	416			17
Internal Link Dist (ft)		112			205			563			288	
Turn Bay Length (ft)									350			
Base Capacity (vph)	191	2288			2011		1503	668	731			358
Starvation Cap Reductn	0	0			0		0	0	0			0
Spillback Cap Reductn	0	90			0		0	0	0			0
Storage Cap Reductn	0	0			0		0	0	0			0
Reduced v/c Ratio	0.72	0.69			0.83		0.68	0.78	0.68			0.22

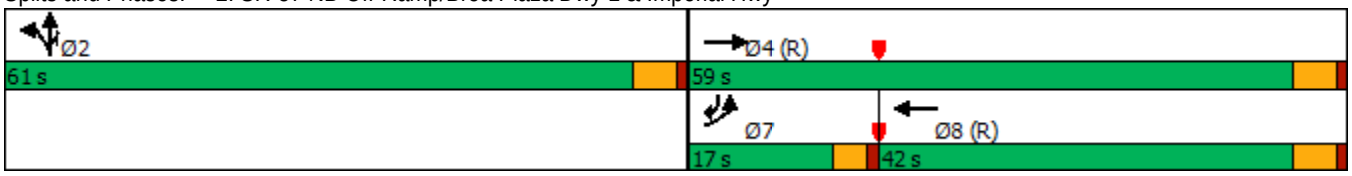
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 10 (8%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 26.2		Intersection LOS: C	
Intersection Capacity Utilization 66.5%		ICU Level of Service C	
Analysis Period (min) 15			

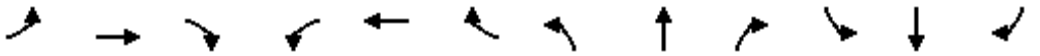
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

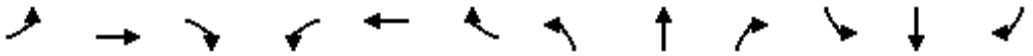
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR-57 NB Off-Ramp/Brea Plaza Dwy 1 & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	937	303	342	763	10	235	6	307	55	29	8
Future Volume (vph)	2	937	303	342	763	10	235	6	307	55	29	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	220		0	225		230	100		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.963			0.998				0.850		0.967	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3408	0	3433	3532	0	3433	1863	1583	1770	1801	0
Flt Permitted	0.950			0.950			0.950			0.753		
Satd. Flow (perm)	1770	3408	0	3433	3532	0	3433	1863	1583	1403	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			1				55		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		664			723			1874			318	
Travel Time (s)		15.1			16.4			42.6			7.2	
Peak Hour Factor	0.86	0.86	0.86	0.91	0.91	0.91	0.82	0.82	0.82	0.74	0.74	0.74
Adj. Flow (vph)	2	1090	352	376	838	11	287	7	374	74	39	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	1442	0	376	849	0	287	7	374	74	50	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8		5	2	3		6	
Permitted Phases									2	6		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	3	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	39.0		10.0	38.0		10.0	38.0	10.0	38.0	38.0	
Total Split (s)	10.0	51.0		17.0	58.0		14.0	52.0	17.0	38.0	38.0	
Total Split (%)	8.3%	42.5%		14.2%	48.3%		11.7%	43.3%	14.2%	31.7%	31.7%	
Maximum Green (s)	6.0	46.0		13.0	53.0		10.0	47.0	13.0	33.0	33.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0	4.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	None	Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		27.0			26.0			26.0		26.0	26.0	
Pedestrian Calls (#/hr)		5			5			5		5	5	
Act Effct Green (s)	6.0	46.0		13.0	61.0		10.0	47.0	65.0	33.0	33.0	
Actuated g/C Ratio	0.05	0.38		0.11	0.51		0.08	0.39	0.54	0.28	0.28	
v/c Ratio	0.02	1.08		1.01	0.47		1.00	0.01	0.42	0.19	0.10	
Control Delay	55.0	85.1		103.2	20.7		101.3	17.7	10.4	35.0	27.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	55.0	85.1		103.2	20.7		101.3	17.7	10.4	35.0	27.4	
LOS	D	F		F	C		F	B	B	C	C	
Approach Delay		85.1			46.0			49.5			31.9	
Approach LOS		F			D			D			C	
Queue Length 50th (ft)	2	~648		~154	208		~115	3	108	44	22	
Queue Length 95th (ft)	10	#727		#257	311		#178	11	167	68	43	
Internal Link Dist (ft)		584			643			1794			238	
Turn Bay Length (ft)	150			220			225		230	100		
Base Capacity (vph)	88	1332		371	1795		286	729	882	385	503	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.02	1.08		1.01	0.47		1.00	0.01	0.42	0.19	0.10	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 77 (64%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 62.5		Intersection LOS: E	
Intersection Capacity Utilization 71.3%		ICU Level of Service C	
Analysis Period (min) 15			

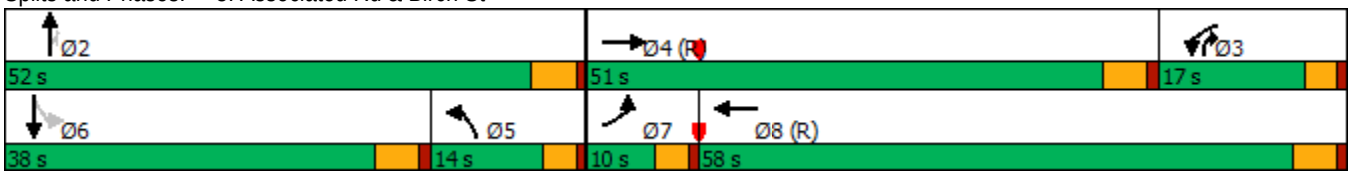
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

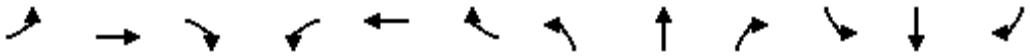
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: Associated Rd & Birch St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1	32	42	8	40	39	392	15	19	460	13
Future Volume (vph)	6	1	32	42	8	40	39	392	15	19	460	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	110		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.888			0.940			0.995			0.996	
Flt Protected		0.992			0.977		0.950			0.950		
Satd. Flow (prot)	0	1641	0	0	1711	0	1770	3522	0	1770	3525	0
Flt Permitted		0.952			0.844		0.467			0.470		
Satd. Flow (perm)	0	1575	0	0	1478	0	870	3522	0	875	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48			39			5			4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		496			521			383			1874	
Travel Time (s)		11.3			11.8			8.7			42.6	
Peak Hour Factor	0.67	0.67	0.67	0.61	0.61	0.61	0.82	0.82	0.82	0.94	0.94	0.94
Adj. Flow (vph)	9	1	48	69	13	66	48	478	18	20	489	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	0	0	148	0	48	496	0	20	503	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

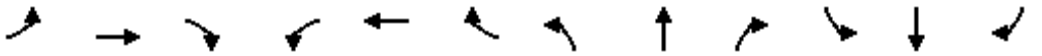


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		25.0	25.0		25.0	25.0	
Total Split (s)	50.0	50.0		50.0	50.0		70.0	70.0		70.0	70.0	
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	
Maximum Green (s)	45.0	45.0		45.0	45.0		65.0	65.0		65.0	65.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0		25.0	25.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		16.6			16.6		93.4	93.4		93.4	93.4	
Actuated g/C Ratio		0.14			0.14		0.78	0.78		0.78	0.78	
v/c Ratio		0.22			0.62		0.07	0.18		0.03	0.18	
Control Delay		15.8			45.3		2.8	2.3		1.0	0.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		15.8			45.3		2.8	2.3		1.0	0.7	
LOS		B			D		A	A		A	A	
Approach Delay		15.8			45.3			2.4			0.7	
Approach LOS		B			D			A			A	
Queue Length 50th (ft)		7			82		4	20		0	1	
Queue Length 95th (ft)		22			73		m10	34		m2	m32	
Internal Link Dist (ft)		416			441			303			1794	
Turn Bay Length (ft)							100			110		
Base Capacity (vph)		620			578		677	2742		681	2744	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.09			0.26		0.07	0.18		0.03	0.18	

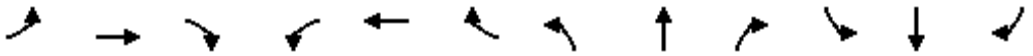
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 21 (18%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 7.3		Intersection LOS: A	
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Associated Rd & Greenbriar Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	1859	101	91	1621	82	148	204	70	146	323	146
Future Volume (vph)	147	1859	101	91	1621	82	148	204	70	146	323	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	170		0	210		0
Storage Lanes	1		0	1		0	2		0	2		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	0.97	0.95	0.95	0.97	1.00	1.00
Frt		0.992			0.993			0.962				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5045	0	1770	6363	0	3433	3405	0	3433	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	5045	0	1770	6363	0	3433	3405	0	3433	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			9			40				157
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			331			892			545	
Travel Time (s)		6.1			7.5			20.3			12.4	
Peak Hour Factor	0.91	0.91	0.91	0.96	0.96	0.96	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	162	2043	111	95	1689	85	166	229	79	157	347	157
Shared Lane Traffic (%)												
Lane Group Flow (vph)	162	2154	0	95	1774	0	166	308	0	157	347	157
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	10.0	38.0		10.0	37.0		10.0	40.0		10.0	41.0	41.0
Total Split (s)	23.0	58.0		11.0	46.0		10.0	40.0		11.0	41.0	41.0
Total Split (%)	19.2%	48.3%		9.2%	38.3%		8.3%	33.3%		9.2%	34.2%	34.2%
Maximum Green (s)	19.0	53.0		7.0	41.0		6.0	35.0		7.0	36.0	36.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		26.0			25.0			28.0			29.0	29.0
Pedestrian Calls (#/hr)		5			5			5			5	5
Act Effct Green (s)	15.6	53.0		7.0	44.4		6.0	35.0		7.0	36.0	36.0
Actuated g/C Ratio	0.13	0.44		0.06	0.37		0.05	0.29		0.06	0.30	0.30
v/c Ratio	0.71	0.96		0.92	0.75		0.97	0.30		0.79	0.62	0.27
Control Delay	71.1	34.8		111.2	26.6		118.7	29.5		66.8	22.8	2.4
Queue Delay	0.0	3.9		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	71.1	38.7		111.2	26.6		118.7	29.5		66.8	22.8	2.4
LOS	E	D		F	C		F	C		E	C	A
Approach Delay		41.0			30.9			60.7			28.4	
Approach LOS		D			C			E			C	
Queue Length 50th (ft)	130	368		75	204		67	84		64	147	2
Queue Length 95th (ft)	m188	#689		#181	219		#137	122		#120	219	30
Internal Link Dist (ft)		187			251			812			465	
Turn Bay Length (ft)				200			170			210		
Base Capacity (vph)	280	2233		103	2362		171	1021		200	558	584
Starvation Cap Reductn	0	62		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.58	0.99		0.92	0.75		0.97	0.30		0.79	0.62	0.27

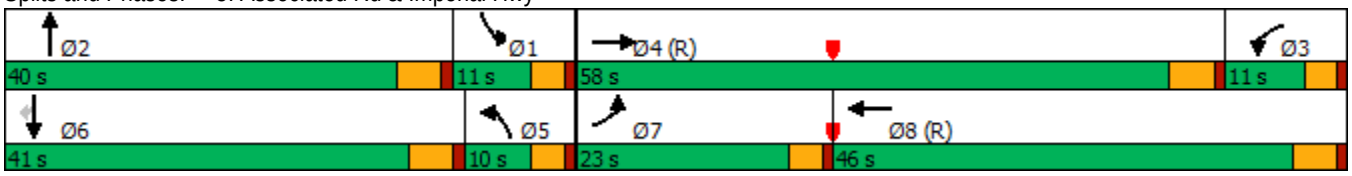
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 37.6		Intersection LOS: D	
Intersection Capacity Utilization 80.2%		ICU Level of Service D	
Analysis Period (min) 15			

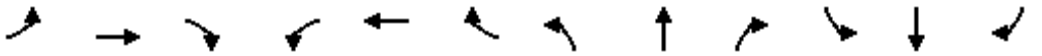
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

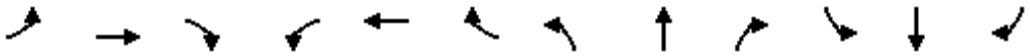
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Associated Rd & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	1814	358	172	1478	32	179	11	142	25	28	13
Future Volume (vph)	12	1814	358	172	1478	32	179	11	142	25	28	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140		200	225		0	195		0	85		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.997				0.850		0.953	
Flt Protected	0.950			0.950			0.950	0.958		0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5070	0	1681	1695	1583	1770	1775	0
Flt Permitted	0.950			0.950			0.950	0.958		0.950		
Satd. Flow (perm)	1770	5085	1583	1770	5070	0	1681	1695	1583	1770	1775	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			265		4				171		14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1111			1324			560			455	
Travel Time (s)		25.3			30.1			12.7			10.3	
Peak Hour Factor	0.95	0.95	0.95	0.89	0.89	0.89	0.83	0.83	0.83	0.67	0.67	0.67
Adj. Flow (vph)	13	1909	377	193	1661	36	216	13	171	37	42	19
Shared Lane Traffic (%)							47%					
Lane Group Flow (vph)	13	1909	377	193	1697	0	114	115	171	37	61	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	33.0	33.0	10.0	26.0		27.0	27.0	27.0	11.0	11.0	
Total Split (s)	10.0	59.0	59.0	23.0	72.0		27.0	27.0	27.0	11.0	11.0	
Total Split (%)	8.3%	49.2%	49.2%	19.2%	60.0%		22.5%	22.5%	22.5%	9.2%	9.2%	
Maximum Green (s)	6.0	54.0	54.0	19.0	67.0		22.0	22.0	22.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0			
Flash Dont Walk (s)		21.0	21.0		14.0		15.0	15.0	15.0			
Pedestrian Calls (#/hr)		5	5		5		5	5	5			
Act Effct Green (s)	6.0	56.2	56.2	16.8	73.0		22.0	22.0	22.0	6.0	6.0	
Actuated g/C Ratio	0.05	0.47	0.47	0.14	0.61		0.18	0.18	0.18	0.05	0.05	
v/c Ratio	0.15	0.80	0.43	0.78	0.55		0.37	0.37	0.40	0.42	0.60	
Control Delay	33.5	9.4	1.2	70.8	15.2		47.0	47.0	9.2	70.0	68.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	33.5	9.4	1.2	70.8	15.2		47.0	47.0	9.2	70.0	68.3	
LOS	C	A	A	E	B		D	D	A	E	E	
Approach Delay		8.2			20.9			30.8			68.9	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	9	116	0	144	239		82	83	0	28	36	
Queue Length 95th (ft)	m9	m124	m0	#225	344		130	131	46	48	58	
Internal Link Dist (ft)		1031			1244			480			375	
Turn Bay Length (ft)	140		200	225			195			85		
Base Capacity (vph)	88	2380	882	280	3085		308	310	429	88	102	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.15	0.80	0.43	0.69	0.55		0.37	0.37	0.40	0.42	0.60	

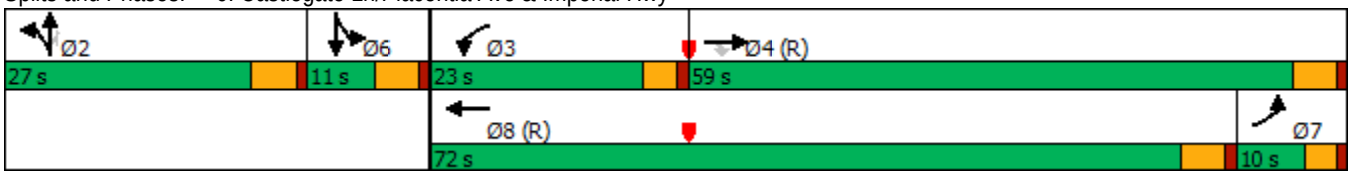
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 3 (3%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 16.5		Intersection LOS: B	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			

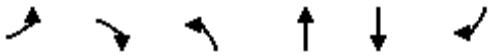
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

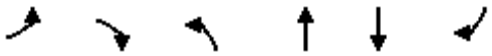
Splits and Phases: 6: Castlegate Ln/Placentia Ave & Imperial Hwy





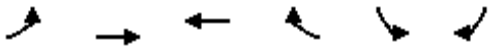
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	8	0	432	595	11
Future Volume (vph)	0	8	0	432	595	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.865			0.997	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3529	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3529	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	540			324	383	
Travel Time (s)	12.3			7.4	8.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	8	0	455	626	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	8	0	455	638	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.8%		ICU Level of Service A	
Analysis Period (min) 15			



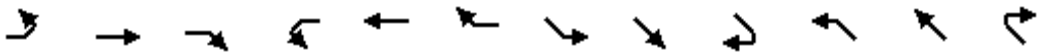
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	21	11	422	593	10
Future Volume (vph)	9	21	11	422	593	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	90			0
Storage Lanes	1	1	1			0
Taper Length (ft)	60		60			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.997	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3529	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3529	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	192			545	324	
Travel Time (s)	4.4			12.4	7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	22	12	444	624	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	22	12	444	635	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.7%		ICU Level of Service A	
Analysis Period (min) 15			



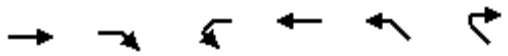
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2110	1906	9	0	9
Future Volume (vph)	0	2110	1906	9	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6401	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6401	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		285	267		252	
Travel Time (s)		6.5	6.1		5.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2221	2006	9	0	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2221	2015	0	0	9
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.8%		ICU Level of Service A	
Analysis Period (min) 15			



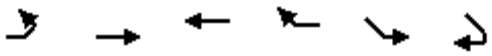
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	1454	548	0	2101	463	0	0	0	0	0	0
Future Volume (vph)	0	1454	548	0	2101	463	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.959				0.850						
Flt Protected												
Satd. Flow (prot)	0	6145	0	0	5085	1583	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	6145	0	0	5085	1583	0	0	0	0	0	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		563			192			626			545	
Travel Time (s)		12.8			4.4			14.2			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1454	548	0	2101	463	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2002	0	0	2101	463	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.9%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	1479	796	0	2422	0	0
Future Volume (vph)	1479	796	0	2422	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	5085	1583	0	5085	0	0
Flt Permitted						
Satd. Flow (perm)	5085	1583	0	5085	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	355			420	859	
Travel Time (s)	8.1			9.5	19.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1479	796	0	2422	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1479	796	0	2422	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.6%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	2056	1921	180	0	0
Future Volume (vph)	0	2056	1921	180	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.987			
Flt Protected						
Satd. Flow (prot)	0	5085	5019	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	5085	5019	0	0	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		362	563		627	
Travel Time (s)		8.2	12.8		14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2056	1921	180	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2056	2101	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	41	0	696	714	9
Future Vol, veh/h	0	41	0	696	714	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	43	0	733	752	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	381	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	617	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	617	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	617	-	-
HCM Lane V/C Ratio	-	0.07	-	-
HCM Control Delay (s)	-	11.3	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

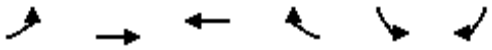
Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	41	128	15	655	722	33
Future Vol, veh/h	41	128	15	655	722	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	135	16	689	760	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1155	398	795	0	-	0
Stage 1	778	-	-	-	-	-
Stage 2	377	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	190	601	822	-	-	-
Stage 1	413	-	-	-	-	-
Stage 2	663	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	186	601	822	-	-	-
Mov Cap-2 Maneuver	186	-	-	-	-	-
Stage 1	405	-	-	-	-	-
Stage 2	663	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	0.2	0
HCM LOS	C		

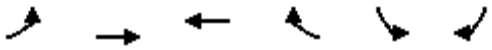
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	822	-	186	601	-	-
HCM Lane V/C Ratio	0.019	-	0.232	0.224	-	-
HCM Control Delay (s)	9.5	-	30.1	12.7	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	0.9	-	-



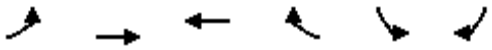
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2207	2126	36	0	49
Future Volume (Veh/h)	0	2207	2126	36	0	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	2323	2238	38	0	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		285	267			
pX, platoon unblocked	0.71				0.82	0.71
vC, conflicting volume	2276				2838	578
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	721				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	93
cM capacity (veh/h)	618				835	765

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	581	581	581	581	639	639	639	358	52
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	38	52
cSH	1700	1700	1700	1700	1700	1700	1700	1700	765
Volume to Capacity	0.34	0.34	0.34	0.34	0.38	0.38	0.38	0.21	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Lane LOS									B
Approach Delay (s)	0.0				0.0				10.0
Approach LOS									B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1701	2442	0	653	548
Future Volume (vph)	0	1701	2442	0	653	548
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	260
Storage Lanes	0			0	2	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.969	0.850
Flt Protected					0.962	
Satd. Flow (prot)	0	5085	5085	0	3369	1441
Flt Permitted					0.962	
Satd. Flow (perm)	0	5085	5085	0	3369	1441
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					2	2
Link Speed (mph)		30	30		30	
Link Distance (ft)		420	362		866	
Travel Time (s)		9.5	8.2		19.7	
Peak Hour Factor	0.95	0.95	0.97	0.97	0.94	0.94
Adj. Flow (vph)	0	1791	2518	0	695	583
Shared Lane Traffic (%)						31%
Lane Group Flow (vph)	0	1791	2518	0	876	402
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		4	8		6	6
Permitted Phases						



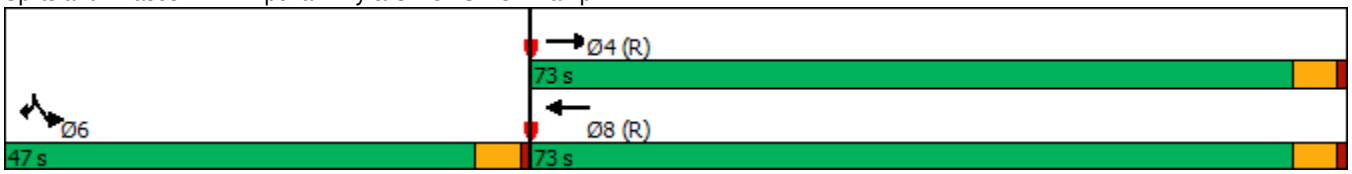
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		6.0	6.0		6.0	6.0
Minimum Split (s)		11.0	27.0		11.0	11.0
Total Split (s)		73.0	73.0		47.0	47.0
Total Split (%)		60.8%	60.8%		39.2%	39.2%
Maximum Green (s)		68.0	68.0		42.0	42.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		Max	Max
Walk Time (s)			7.0			
Flash Dont Walk (s)			15.0			
Pedestrian Calls (#/hr)			5			
Act Effct Green (s)		68.0	68.0		42.0	42.0
Actuated g/C Ratio		0.57	0.57		0.35	0.35
v/c Ratio		0.62	0.87		0.74	0.80
Control Delay		18.6	16.9		38.8	48.3
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		18.6	16.9		38.8	48.3
LOS		B	B		D	D
Approach Delay		18.6	16.9		41.8	
Approach LOS		B	B		D	
Queue Length 50th (ft)		323	299		304	304
Queue Length 95th (ft)		371	319		381	#481
Internal Link Dist (ft)		340	282		786	
Turn Bay Length (ft)						260
Base Capacity (vph)		2881	2881		1180	505
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.62	0.87		0.74	0.80

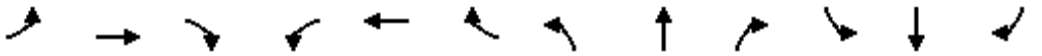
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 5 (4%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 23.1		Intersection LOS: C	
Intersection Capacity Utilization 79.9%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.

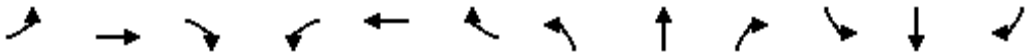
Queue shown is maximum after two cycles.

Splits and Phases: 1: Imperial Hwy & SR-57 SB Off-Ramp





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	1796	0	0	2340	47	1089	74	409	0	0	239
Future Volume (vph)	213	1796	0	0	2340	47	1089	74	409	0	0	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		350	0		0
Storage Lanes	1		0	0		0	2		1	0		2
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86	0.86	0.91	0.86	0.95	1.00	1.00	0.88
Frt					0.997			0.983	0.850			0.850
Flt Protected	0.950						0.950	0.966				
Satd. Flow (prot)	1770	5085	0	0	6389	0	3221	1521	1504	0	0	2787
Flt Permitted	0.950						0.950	0.966				
Satd. Flow (perm)	1770	5085	0	0	6389	0	3221	1521	1504	0	0	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4			6	55			64
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		192			285			643			368	
Travel Time (s)		4.4			6.5			14.6			8.4	
Peak Hour Factor	0.95	0.95	0.95	0.98	0.98	0.98	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	224	1891	0	0	2388	48	1146	78	431	0	0	272
Shared Lane Traffic (%)							26%		11%			
Lane Group Flow (vph)	224	1891	0	0	2436	0	848	423	384	0	0	272
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			1
Detector Template	Left	Thru			Thru		Left	Thru	Right			Right
Leading Detector (ft)	20	100			100		20	100	20			20
Trailing Detector (ft)	0	0			0		0	0	0			0
Detector 1 Position(ft)	0	0			0		0	0	0			0
Detector 1 Size(ft)	20	6			6		20	6	20			20
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Prot	NA			NA		Split	NA	Prot			Over
Protected Phases	7	4			8		2	2	2			7
Permitted Phases												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4			8		2	2	2			7
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0		6.0	6.0	6.0			6.0
Minimum Split (s)	10.0	34.0			31.0		11.0	11.0	11.0			10.0
Total Split (s)	21.0	76.0			55.0		44.0	44.0	44.0			21.0
Total Split (%)	17.5%	63.3%			45.8%		36.7%	36.7%	36.7%			17.5%
Maximum Green (s)	17.0	71.0			50.0		39.0	39.0	39.0			17.0
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0			3.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0	1.0			1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Total Lost Time (s)	4.0	5.0			5.0		5.0	5.0	5.0			4.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Recall Mode	None	C-Max			C-Max		Max	Max	Max			None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		22.0			19.0							
Pedestrian Calls (#/hr)		5			5							
Act Effct Green (s)	16.7	71.0			50.3		39.0	39.0	39.0			16.7
Actuated g/C Ratio	0.14	0.59			0.42		0.32	0.32	0.32			0.14
v/c Ratio	0.91	0.63			0.91		0.81	0.85	0.73			0.61
Control Delay	85.8	17.5			12.5		44.4	54.5	40.0			43.4
Queue Delay	0.0	0.2			0.4		0.0	0.0	0.0			0.0
Total Delay	85.8	17.7			12.8		44.4	54.5	40.0			43.4
LOS	F	B			B		D	D	D			D
Approach Delay		24.9			12.8			46.0			43.4	
Approach LOS		C			B			D			D	
Queue Length 50th (ft)	172	292			139		329	350	238			86
Queue Length 95th (ft)	m#313	355			m144		414	#555	367			133
Internal Link Dist (ft)		112			205			563			288	
Turn Bay Length (ft)									350			
Base Capacity (vph)	250	3008			2678		1046	498	525			449
Starvation Cap Reductn	0	0			38		0	0	0			0
Spillback Cap Reductn	0	332			0		0	0	2			0
Storage Cap Reductn	0	0			0		0	0	0			0
Reduced v/c Ratio	0.90	0.71			0.92		0.81	0.85	0.73			0.61

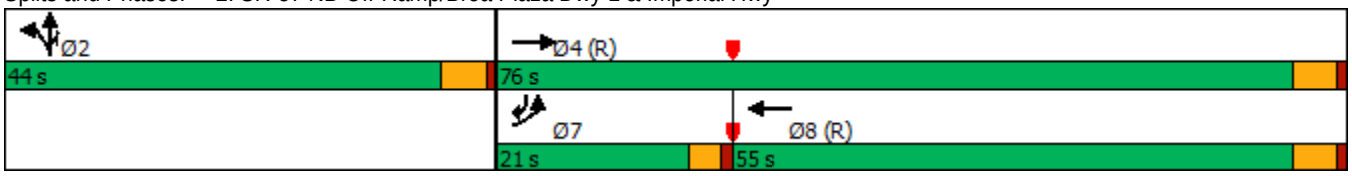
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 119 (99%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 26.5		Intersection LOS: C	
Intersection Capacity Utilization 82.3%		ICU Level of Service E	
Analysis Period (min) 15			

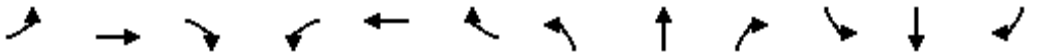
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

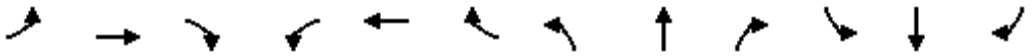
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR-57 NB Off-Ramp/Brea Plaza Dwy 1 & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	874	286	283	1241	16	460	32	343	10	20	6
Future Volume (vph)	12	874	286	283	1241	16	460	32	343	10	20	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	220		0	225		230	100		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.963			0.998				0.850		0.966	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3408	0	3433	3532	0	3433	1863	1583	1770	1799	0
Flt Permitted	0.950			0.950			0.950			0.735		
Satd. Flow (perm)	1770	3408	0	3433	3532	0	3433	1863	1583	1369	1799	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			1				55		7	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		664			723			1874			318	
Travel Time (s)		15.1			16.4			42.6			7.2	
Peak Hour Factor	0.99	0.99	0.99	0.94	0.94	0.94	0.94	0.94	0.94	0.85	0.85	0.85
Adj. Flow (vph)	12	883	289	301	1320	17	489	34	365	12	24	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1172	0	301	1337	0	489	34	365	12	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8		5	2	3		6	
Permitted Phases									2	6		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	3	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	39.0		10.0	38.0		10.0	38.0	10.0	38.0	38.0	
Total Split (s)	10.0	45.0		15.0	50.0		22.0	60.0	15.0	38.0	38.0	
Total Split (%)	8.3%	37.5%		12.5%	41.7%		18.3%	50.0%	12.5%	31.7%	31.7%	
Maximum Green (s)	6.0	40.0		11.0	45.0		18.0	55.0	11.0	33.0	33.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0	4.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	None	Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		27.0			26.0			26.0		26.0	26.0	
Pedestrian Calls (#/hr)		5			5			5		5	5	
Act Effct Green (s)	6.0	40.0		11.0	51.0		18.0	55.0	71.0	33.0	33.0	
Actuated g/C Ratio	0.05	0.33		0.09	0.42		0.15	0.46	0.59	0.28	0.28	
v/c Ratio	0.14	1.01		0.96	0.89		0.95	0.04	0.38	0.03	0.06	
Control Delay	58.2	67.2		95.8	41.4		75.3	16.5	10.1	32.3	27.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	58.2	67.2		95.8	41.4		75.3	16.5	10.1	32.3	27.0	
LOS	E	E		F	D		E	B	B	C	C	
Approach Delay		67.1			51.4			46.2			28.5	
Approach LOS		E			D			D			C	
Queue Length 50th (ft)	9	~472		121	463		183	15	126	7	14	
Queue Length 95th (ft)	30	#627		#210	#711		#291	35	187	21	36	
Internal Link Dist (ft)		584			643			1794			238	
Turn Bay Length (ft)	150			220			225		230	100		
Base Capacity (vph)	88	1162		314	1501		514	853	959	376	499	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.14	1.01		0.96	0.89		0.95	0.04	0.38	0.03	0.06	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 81 (68%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 54.9		Intersection LOS: D	
Intersection Capacity Utilization 72.8%		ICU Level of Service C	
Analysis Period (min) 15			

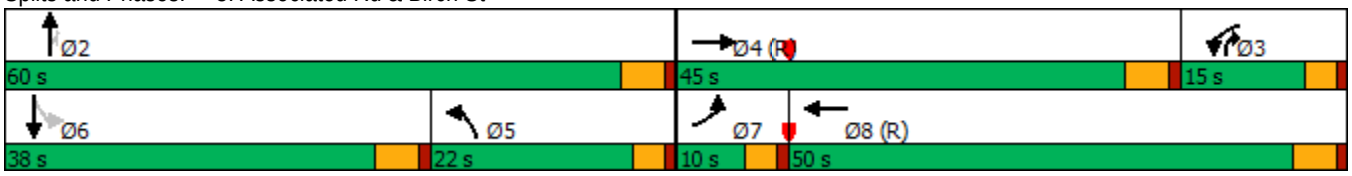
~ Volume exceeds capacity, queue is theoretically infinite.

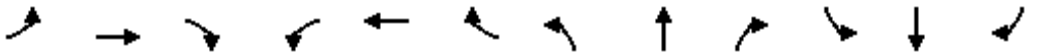
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

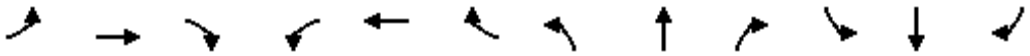
Queue shown is maximum after two cycles.

Splits and Phases: 3: Associated Rd & Birch St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	9	45	27	4	35	39	526	37	16	549	8
Future Volume (vph)	19	9	45	27	4	35	39	526	37	16	549	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	110		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.917			0.928			0.990			0.998	
Flt Protected		0.987			0.980		0.950			0.950		
Satd. Flow (prot)	0	1686	0	0	1694	0	1770	3504	0	1770	3532	0
Flt Permitted		0.892			0.794		0.420			0.423		
Satd. Flow (perm)	0	1524	0	0	1373	0	782	3504	0	788	3532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50			43			9			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		496			521			383			1874	
Travel Time (s)		11.3			11.8			8.7			42.6	
Peak Hour Factor	0.90	0.90	0.90	0.81	0.81	0.81	0.93	0.93	0.93	0.91	0.91	0.91
Adj. Flow (vph)	21	10	50	33	5	43	42	566	40	18	603	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	81	0	42	606	0	18	612	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

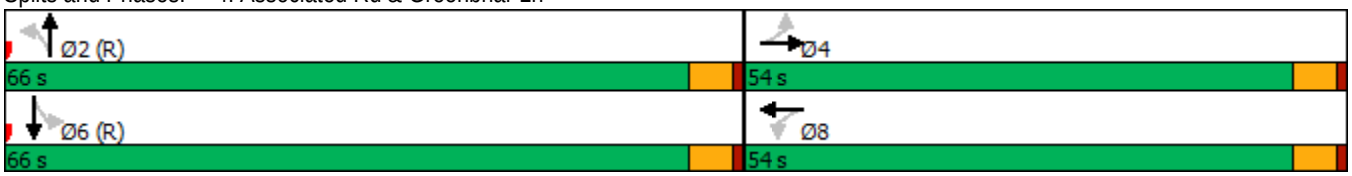


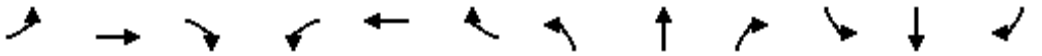
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		25.0	25.0		25.0	25.0	
Total Split (s)	54.0	54.0		54.0	54.0		66.0	66.0		66.0	66.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		55.0%	55.0%		55.0%	55.0%	
Maximum Green (s)	49.0	49.0		49.0	49.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0		25.0	25.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.7			12.7		100.5	100.5		100.5	100.5	
Actuated g/C Ratio		0.11			0.11		0.84	0.84		0.84	0.84	
v/c Ratio		0.39			0.44		0.06	0.21		0.03	0.21	
Control Delay		25.6			31.2		1.7	1.4		1.2	1.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		25.6			31.2		1.7	1.4		1.2	1.1	
LOS		C			C		A	A		A	A	
Approach Delay		25.6			31.2			1.4			1.1	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		23			29		2	12		0	1	
Queue Length 95th (ft)		58			54		m5	m40		m3	m55	
Internal Link Dist (ft)		416			441			303			1794	
Turn Bay Length (ft)							100			110		
Base Capacity (vph)		651			586		655	2936		660	2958	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.12			0.14		0.06	0.21		0.03	0.21	

Intersection Summary

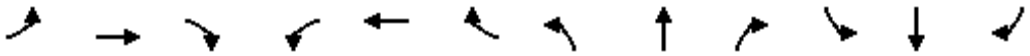
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 29 (24%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.44
Intersection Signal Delay: 4.3 Intersection LOS: A
Intersection Capacity Utilization 39.5% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Associated Rd & Greenbriar Ln





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	249	1817	139	172	1721	168	217	254	82	286	343	223
Future Volume (vph)	249	1817	139	172	1721	168	217	254	82	286	343	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	170		0	210		0
Storage Lanes	1		0	1		0	2		0	2		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	0.97	0.95	0.95	0.97	1.00	1.00
Frt		0.989			0.987			0.963				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5029	0	1770	6325	0	3433	3408	0	3433	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	5029	0	1770	6325	0	3433	3408	0	3433	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			19			37				269
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			331			892			545	
Travel Time (s)		6.1			7.5			20.3			12.4	
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.91	0.91	0.91	0.83	0.83	0.83
Adj. Flow (vph)	262	1913	146	183	1831	179	238	279	90	345	413	269
Shared Lane Traffic (%)												
Lane Group Flow (vph)	262	2059	0	183	2010	0	238	369	0	345	413	269
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	10.0	38.0		10.0	37.0		10.0	40.0		10.0	41.0	41.0
Total Split (s)	23.0	49.0		16.0	42.0		14.0	40.0		15.0	41.0	41.0
Total Split (%)	19.2%	40.8%		13.3%	35.0%		11.7%	33.3%		12.5%	34.2%	34.2%
Maximum Green (s)	19.0	44.0		12.0	37.0		10.0	35.0		11.0	36.0	36.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		26.0			25.0			28.0			29.0	29.0
Pedestrian Calls (#/hr)		5			5			5			5	5
Act Effct Green (s)	19.0	44.0		12.0	37.0		10.0	35.0		11.0	36.0	36.0
Actuated g/C Ratio	0.16	0.37		0.10	0.31		0.08	0.29		0.09	0.30	0.30
v/c Ratio	0.94	1.11		1.03	1.02		0.83	0.36		1.10	0.74	0.41
Control Delay	95.4	84.5		115.0	57.9		78.2	31.3		120.4	30.6	2.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	95.4	84.5		115.0	57.9		78.2	31.3		120.4	30.6	2.3
LOS	F	F		F	E		E	C		F	C	A
Approach Delay		85.7			62.7			49.7			53.4	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)	196	~671		~141	~380		95	106		~159	196	5
Queue Length 95th (ft)	m#354	#747		#296	#542		#162	151		#228	281	0
Internal Link Dist (ft)		187			251			812			465	
Turn Bay Length (ft)				200			170			210		
Base Capacity (vph)	280	1850		177	1964		286	1020		314	558	663
Starvation Cap Reductn	0	21		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.94	1.13		1.03	1.02		0.83	0.36		1.10	0.74	0.41

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 68.5		Intersection LOS: E	
Intersection Capacity Utilization 87.0%		ICU Level of Service E	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.

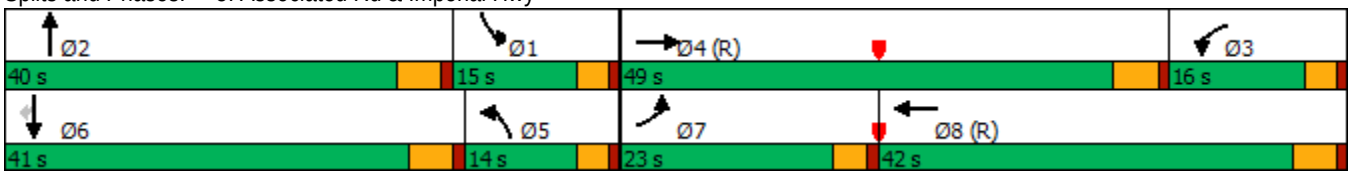
Queue shown is maximum after two cycles.

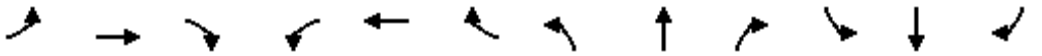
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

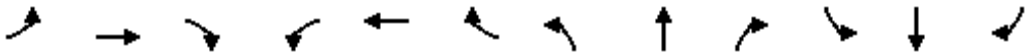
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Associated Rd & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1826	281	226	1875	56	250	46	261	25	23	13
Future Volume (vph)	19	1826	281	226	1875	56	250	46	261	25	23	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140		200	225		0	195		0	85		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.996				0.850		0.945	
Flt Protected	0.950			0.950			0.950	0.967		0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5065	0	1681	1711	1583	1770	1760	0
Flt Permitted	0.950			0.950			0.950	0.967		0.950		
Satd. Flow (perm)	1770	5085	1583	1770	5065	0	1681	1711	1583	1770	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			200		6				303		18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1111			1324			560			455	
Travel Time (s)		25.3			30.1			12.7			10.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.65	0.65	0.65
Adj. Flow (vph)	20	1922	296	238	1974	59	291	53	303	38	35	20
Shared Lane Traffic (%)							41%					
Lane Group Flow (vph)	20	1922	296	238	2033	0	172	172	303	38	55	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	33.0	33.0	10.0	26.0		27.0	27.0	27.0	11.0	11.0	
Total Split (s)	10.0	57.0	57.0	25.0	72.0		27.0	27.0	27.0	11.0	11.0	
Total Split (%)	8.3%	47.5%	47.5%	20.8%	60.0%		22.5%	22.5%	22.5%	9.2%	9.2%	
Maximum Green (s)	6.0	52.0	52.0	21.0	67.0		22.0	22.0	22.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0			
Flash Dont Walk (s)		21.0	21.0		14.0		15.0	15.0	15.0			
Pedestrian Calls (#/hr)		5	5		5		5	5	5			
Act Effct Green (s)	6.0	53.7	53.7	19.3	73.0		22.0	22.0	22.0	6.0	6.0	
Actuated g/C Ratio	0.05	0.45	0.45	0.16	0.61		0.18	0.18	0.18	0.05	0.05	
v/c Ratio	0.23	0.85	0.36	0.84	0.66		0.56	0.55	0.56	0.43	0.52	
Control Delay	25.7	3.8	0.3	73.3	17.3		52.4	52.0	9.2	70.7	58.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	25.7	3.8	0.3	73.3	17.3		52.4	52.0	9.2	70.7	58.3	
LOS	C	A	A	E	B		D	D	A	E	E	
Approach Delay		3.5			23.2			32.1			63.4	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	13	86	1	178	318		128	128	0	29	28	
Queue Length 95th (ft)	m13	m69	m0	#297	462		196	195	63	47	47	
Internal Link Dist (ft)		1031			1244			480			375	
Turn Bay Length (ft)	140		200	225			195			85		
Base Capacity (vph)	88	2274	818	309	3083		308	313	537	88	105	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.23	0.85	0.36	0.77	0.66		0.56	0.55	0.56	0.43	0.52	

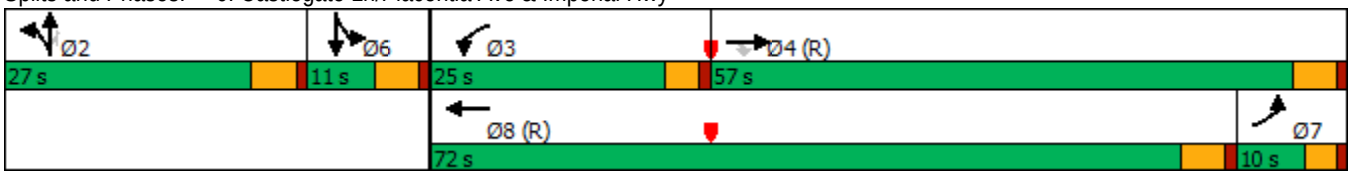
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 1 (1%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 74.3%		ICU Level of Service D	
Analysis Period (min) 15			

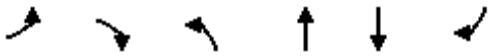
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

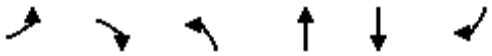
Splits and Phases: 6: Castlegate Ln/Placentia Ave & Imperial Hwy





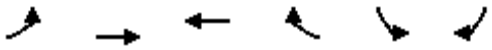
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	41	0	696	714	9
Future Volume (vph)	0	41	0	696	714	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.865			0.998	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3532	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3532	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	540			324	383	
Travel Time (s)	12.3			7.4	8.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	43	0	733	752	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	0	733	761	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.0%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	41	128	15	655	722	33
Future Volume (vph)	41	128	15	655	722	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	90			0
Storage Lanes	1	1	1			0
Taper Length (ft)	60		60			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.993	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3514	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3514	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	192			545	324	
Travel Time (s)	4.4			12.4	7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	43	135	16	689	760	35
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	135	16	689	795	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.6%		ICU Level of Service A	
Analysis Period (min) 15			

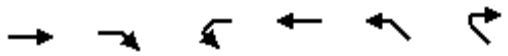


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2207	2126	36	0	49
Future Volume (vph)	0	2207	2126	36	0	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.997			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6389	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6389	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		285	267		252	
Travel Time (s)		6.5	6.1		5.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2323	2238	38	0	52
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2323	2276	0	0	52
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.4%		ICU Level of Service A	
Analysis Period (min) 15			

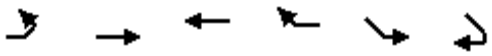
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	2009	371	0	2830	838	0	0	0	0	0	0
Future Volume (vph)	0	2009	371	0	2830	838	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.977				0.850						
Flt Protected												
Satd. Flow (prot)	0	6260	0	0	5085	1583	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	6260	0	0	5085	1583	0	0	0	0	0	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		563			192			626			545	
Travel Time (s)		12.8			4.4			14.2			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2009	371	0	2830	838	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2380	0	0	2830	838	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	1701	1051	0	2990	0	0
Future Volume (vph)	1701	1051	0	2990	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	5085	1583	0	5085	0	0
Flt Permitted						
Satd. Flow (perm)	5085	1583	0	5085	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	355			420	859	
Travel Time (s)	8.1			9.5	19.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1701	1051	0	2990	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1701	1051	0	2990	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 68.4%		ICU Level of Service C	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	2354	2442	388	0	0
Future Volume (vph)	0	2354	2442	388	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.979			
Flt Protected						
Satd. Flow (prot)	0	5085	4979	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	5085	4979	0	0	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		362	563		627	
Travel Time (s)		8.2	12.8		14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2354	2442	388	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2354	2830	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 79.9%		ICU Level of Service D	
Analysis Period (min) 15			

APPENDIX F-II

YEAR 2024 CUMULATIVE PLUS PROJECT
TRAFFIC CONDITIONS

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	12	0	510	611	3
Future Vol, veh/h	0	12	0	510	611	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	13	0	537	643	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	323	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	673	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	673	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	673	-	-
HCM Lane V/C Ratio	-	0.019	-	-
HCM Control Delay (s)	-	10.5	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

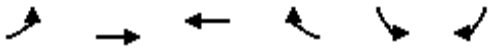
Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	25	12	493	607	16
Future Vol, veh/h	16	25	12	493	607	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	26	13	519	639	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	934	328	656	0	-	0
Stage 1	648	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	264	668	927	-	-	-
Stage 1	483	-	-	-	-	-
Stage 2	737	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	260	668	927	-	-	-
Mov Cap-2 Maneuver	260	-	-	-	-	-
Stage 1	476	-	-	-	-	-
Stage 2	737	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.2	0.2	0
HCM LOS	B		

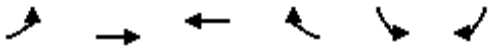
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	927	-	260	668	-	-
HCM Lane V/C Ratio	0.014	-	0.065	0.039	-	-
HCM Control Delay (s)	8.9	-	19.8	10.6	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.1	-	-



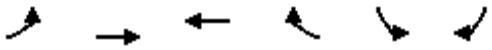
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2170	1909	10	0	9
Future Volume (Veh/h)	0	2170	1909	10	0	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	2284	2009	11	0	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		285	267			
pX, platoon unblocked	0.76				0.86	0.76
vC, conflicting volume	2020				2586	508
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	729				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	657				882	819

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	571	571	571	571	574	574	574	298	9
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	11	9
cSH	1700	1700	1700	1700	1700	1700	1700	1700	819
Volume to Capacity	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.18	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4
Lane LOS									A
Approach Delay (s)	0.0				0.0				9.4
Approach LOS									A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		



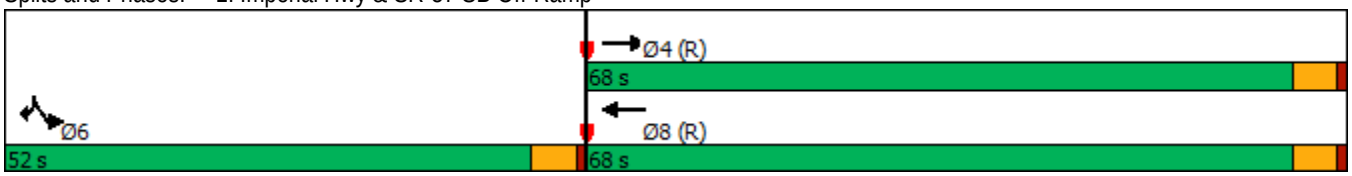
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1494	1949	0	580	501
Future Volume (vph)	0	1494	1949	0	580	501
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	260
Storage Lanes	0			0	2	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.968	0.850
Flt Protected					0.962	
Satd. Flow (prot)	0	5085	5085	0	3365	1441
Flt Permitted					0.962	
Satd. Flow (perm)	0	5085	5085	0	3365	1441
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					5	5
Link Speed (mph)		30	30		30	
Link Distance (ft)		420	362		866	
Travel Time (s)		9.5	8.2		19.7	
Peak Hour Factor	0.93	0.93	0.94	0.94	0.88	0.88
Adj. Flow (vph)	0	1606	2073	0	659	569
Shared Lane Traffic (%)						32%
Lane Group Flow (vph)	0	1606	2073	0	841	387
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		4	8		6	6
Permitted Phases						

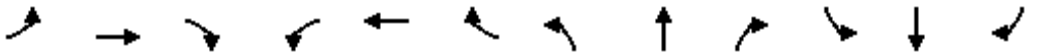


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		6.0	6.0		6.0	6.0
Minimum Split (s)		11.0	27.0		11.0	11.0
Total Split (s)		68.0	68.0		52.0	52.0
Total Split (%)		56.7%	56.7%		43.3%	43.3%
Maximum Green (s)		63.0	63.0		47.0	47.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		Max	Max
Walk Time (s)			7.0			
Flash Dont Walk (s)			15.0			
Pedestrian Calls (#/hr)			5			
Act Effct Green (s)		63.0	63.0		47.0	47.0
Actuated g/C Ratio		0.52	0.52		0.39	0.39
v/c Ratio		0.60	0.78		0.64	0.68
Control Delay		21.0	17.3		32.1	37.3
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		21.0	17.3		32.1	37.3
LOS		C	B		C	D
Approach Delay		21.0	17.3		33.7	
Approach LOS		C	B		C	
Queue Length 50th (ft)		304	428		267	267
Queue Length 95th (ft)		352	519		325	382
Internal Link Dist (ft)		340	282		786	
Turn Bay Length (ft)						260
Base Capacity (vph)		2669	2669		1321	567
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.60	0.78		0.64	0.68

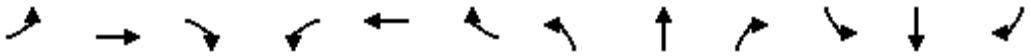
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 49 (41%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 22.6		Intersection LOS: C	
Intersection Capacity Utilization 67.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Imperial Hwy & SR-57 SB Off-Ramp





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	1373	0	0	1482	14	1037	31	804	0	0	87
Future Volume (vph)	100	1373	0	0	1482	14	1037	31	804	0	0	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		350	0		0
Storage Lanes	1		0	0		0	2		1	0		2
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86	0.86	0.91	0.86	0.95	1.00	1.00	0.88
Frt					0.999			0.892	0.850			0.850
Flt Protected	0.950						0.950	0.989				
Satd. Flow (prot)	1770	5085	0	0	6401	0	3221	1413	1504	0	0	2787
Flt Permitted	0.950						0.950	0.989				
Satd. Flow (perm)	1770	5085	0	0	6401	0	3221	1413	1504	0	0	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			9	55			64
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		192			285			643			368	
Travel Time (s)		4.4			6.5			14.6			8.4	
Peak Hour Factor	0.88	0.88	0.88	0.89	0.89	0.89	0.91	0.91	0.91	0.68	0.68	0.68
Adj. Flow (vph)	114	1560	0	0	1665	16	1140	34	884	0	0	128
Shared Lane Traffic (%)							10%		43%			
Lane Group Flow (vph)	114	1560	0	0	1681	0	1026	528	504	0	0	128
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			1
Detector Template	Left	Thru			Thru		Left	Thru	Right			Right
Leading Detector (ft)	20	100			100		20	100	20			20
Trailing Detector (ft)	0	0			0		0	0	0			0
Detector 1 Position(ft)	0	0			0		0	0	0			0
Detector 1 Size(ft)	20	6			6		20	6	20			20
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Prot	NA			NA		Split	NA	Prot			Over
Protected Phases	7	4			8		2	2	2			7
Permitted Phases												

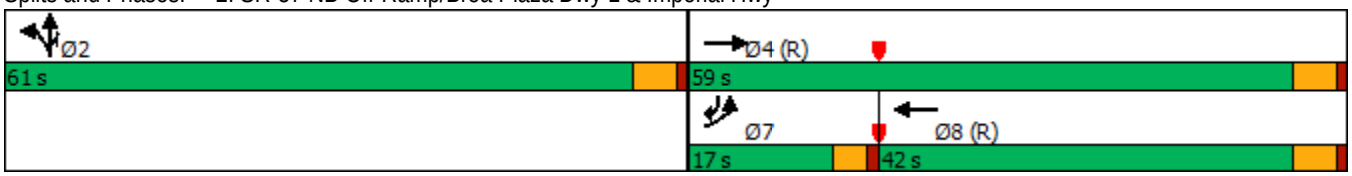


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4			8		2	2	2			7
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0		6.0	6.0	6.0			6.0
Minimum Split (s)	10.0	34.0			31.0		11.0	11.0	11.0			10.0
Total Split (s)	17.0	59.0			42.0		61.0	61.0	61.0			17.0
Total Split (%)	14.2%	49.2%			35.0%		50.8%	50.8%	50.8%			14.2%
Maximum Green (s)	13.0	54.0			37.0		56.0	56.0	56.0			13.0
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0			3.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0	1.0			1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Total Lost Time (s)	4.0	5.0			5.0		5.0	5.0	5.0			4.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Recall Mode	None	C-Max			C-Max		Max	Max	Max			None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		22.0			19.0							
Pedestrian Calls (#/hr)		5			5							
Act Effct Green (s)	11.6	54.0			38.4		56.0	56.0	56.0			11.6
Actuated g/C Ratio	0.10	0.45			0.32		0.47	0.47	0.47			0.10
v/c Ratio	0.67	0.68			0.82		0.68	0.80	0.69			0.39
Control Delay	62.7	27.8			15.7		28.0	37.3	28.1			29.6
Queue Delay	0.0	0.1			0.0		0.0	0.0	0.0			0.0
Total Delay	62.7	27.9			15.7		28.0	37.3	28.1			29.6
LOS	E	C			B		C	D	C			C
Approach Delay		30.3			15.7			30.4			29.6	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	88	354			77		333	388	283			26
Queue Length 95th (ft)	m146	413			m125		414	575	421			38
Internal Link Dist (ft)		112			205			563			288	
Turn Bay Length (ft)									350			
Base Capacity (vph)	191	2288			2050		1503	664	731			358
Starvation Cap Reductn	0	0			0		0	0	0			0
Spillback Cap Reductn	0	96			0		0	0	1			0
Storage Cap Reductn	0	0			0		0	0	0			0
Reduced v/c Ratio	0.60	0.71			0.82		0.68	0.80	0.69			0.36

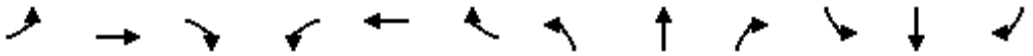
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 10 (8%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 25.9		Intersection LOS: C	
Intersection Capacity Utilization 68.1%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR-57 NB Off-Ramp/Brea Plaza Dwy 1 & Imperial Hwy



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	937	306	344	763	10	239	6	311	55	29	8
Future Volume (vph)	2	937	306	344	763	10	239	6	311	55	29	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	220		0	225		230	100		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.963			0.998				0.850		0.967	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3408	0	3433	3532	0	3433	1863	1583	1770	1801	0
Flt Permitted	0.950			0.950			0.950			0.753		
Satd. Flow (perm)	1770	3408	0	3433	3532	0	3433	1863	1583	1403	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43			1				55		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		664			723			1874			318	
Travel Time (s)		15.1			16.4			42.6			7.2	
Peak Hour Factor	0.86	0.86	0.86	0.91	0.91	0.91	0.82	0.82	0.82	0.74	0.74	0.74
Adj. Flow (vph)	2	1090	356	378	838	11	291	7	379	74	39	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	1446	0	378	849	0	291	7	379	74	50	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8		5	2	3		6	
Permitted Phases									2	6		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	3	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	39.0		10.0	38.0		10.0	38.0	10.0	38.0	38.0	
Total Split (s)	10.0	51.0		17.0	58.0		14.0	52.0	17.0	38.0	38.0	
Total Split (%)	8.3%	42.5%		14.2%	48.3%		11.7%	43.3%	14.2%	31.7%	31.7%	
Maximum Green (s)	6.0	46.0		13.0	53.0		10.0	47.0	13.0	33.0	33.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0	4.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	None	Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		27.0			26.0			26.0		26.0	26.0	
Pedestrian Calls (#/hr)		5			5			5		5	5	
Act Effct Green (s)	6.0	46.0		13.0	61.0		10.0	47.0	65.0	33.0	33.0	
Actuated g/C Ratio	0.05	0.38		0.11	0.51		0.08	0.39	0.54	0.28	0.28	
v/c Ratio	0.02	1.09		1.02	0.47		1.02	0.01	0.43	0.19	0.10	
Control Delay	55.0	86.2		104.4	20.7		104.1	19.8	11.3	35.0	27.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	55.0	86.2		104.4	20.7		104.1	19.8	11.3	35.0	27.4	
LOS	D	F		F	C		F	B	B	C	C	
Approach Delay		86.1			46.5			51.3			31.9	
Approach LOS		F			D			D			C	
Queue Length 50th (ft)	2	~651		~156	208		~111	3	98	44	22	
Queue Length 95th (ft)	10	#731		#259	311		#180	10	170	68	43	
Internal Link Dist (ft)		584			643			1794			238	
Turn Bay Length (ft)	150			220			225		230	100		
Base Capacity (vph)	88	1332		371	1795		286	729	882	385	503	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.02	1.09		1.02	0.47		1.02	0.01	0.43	0.19	0.10	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 77 (64%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 63.4		Intersection LOS: E	
Intersection Capacity Utilization 71.6%		ICU Level of Service C	
Analysis Period (min) 15			

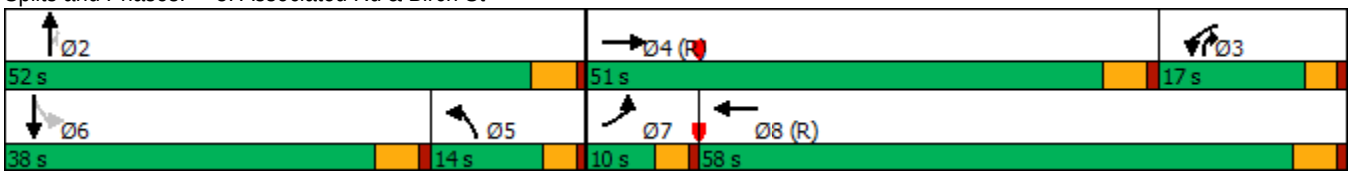
~ Volume exceeds capacity, queue is theoretically infinite.

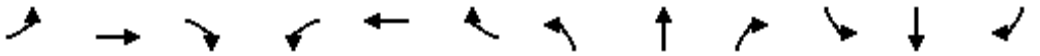
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

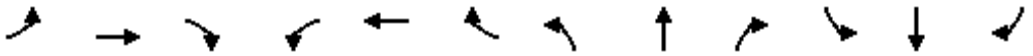
Queue shown is maximum after two cycles.

Splits and Phases: 3: Associated Rd & Birch St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1	42	42	8	40	110	399	15	19	459	20
Future Volume (vph)	7	1	42	42	8	40	110	399	15	19	459	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	110		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.885			0.940			0.995			0.994	
Flt Protected		0.993			0.977		0.950			0.950		
Satd. Flow (prot)	0	1637	0	0	1711	0	1770	3522	0	1770	3518	0
Flt Permitted		0.955			0.807		0.465			0.466		
Satd. Flow (perm)	0	1574	0	0	1413	0	866	3522	0	868	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63			39			5			6	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		496			521			383			1874	
Travel Time (s)		11.3			11.8			8.7			42.6	
Peak Hour Factor	0.67	0.67	0.67	0.61	0.61	0.61	0.82	0.82	0.82	0.94	0.94	0.94
Adj. Flow (vph)	10	1	63	69	13	66	134	487	18	20	488	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	74	0	0	148	0	134	505	0	20	509	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

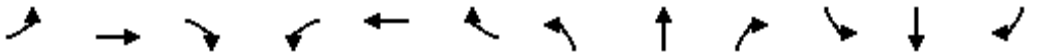


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		25.0	25.0		25.0	25.0	
Total Split (s)	50.0	50.0		50.0	50.0		70.0	70.0		70.0	70.0	
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	
Maximum Green (s)	45.0	45.0		45.0	45.0		65.0	65.0		65.0	65.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0		25.0	25.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		16.6			16.6		93.4	93.4		93.4	93.4	
Actuated g/C Ratio		0.14			0.14		0.78	0.78		0.78	0.78	
v/c Ratio		0.27			0.65		0.20	0.18		0.03	0.19	
Control Delay		14.7			46.9		3.0	2.2		1.0	0.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		14.7			46.9		3.0	2.2		1.0	0.7	
LOS		B			D		A	A		A	A	
Approach Delay		14.7			46.9			2.3			0.7	
Approach LOS		B			D			A			A	
Queue Length 50th (ft)		8			82		10	19		0	1	
Queue Length 95th (ft)		23			74		m20	32		m2	m32	
Internal Link Dist (ft)		416			441			303			1794	
Turn Bay Length (ft)							100			110		
Base Capacity (vph)		629			554		673	2741		675	2738	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.12			0.27		0.20	0.18		0.03	0.19	

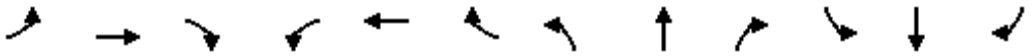
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 21 (18%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 43.8%		ICU Level of Service A	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Associated Rd & Greenbriar Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	1859	101	91	1616	94	148	205	70	155	325	154
Future Volume (vph)	207	1859	101	91	1616	94	148	205	70	155	325	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	170		0	210		0
Storage Lanes	1		0	1		0	2		0	2		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	0.97	0.95	0.95	0.97	1.00	1.00
Frt		0.992			0.992			0.962				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5045	0	1770	6357	0	3433	3405	0	3433	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	5045	0	1770	6357	0	3433	3405	0	3433	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			11			40				166
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			331			892			545	
Travel Time (s)		6.1			7.5			20.3			12.4	
Peak Hour Factor	0.91	0.91	0.91	0.96	0.96	0.96	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	227	2043	111	95	1683	98	166	230	79	167	349	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	227	2154	0	95	1781	0	166	309	0	167	349	166
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	10.0	38.0		10.0	37.0		10.0	40.0		10.0	41.0	41.0
Total Split (s)	23.0	58.0		11.0	46.0		10.0	40.0		11.0	41.0	41.0
Total Split (%)	19.2%	48.3%		9.2%	38.3%		8.3%	33.3%		9.2%	34.2%	34.2%
Maximum Green (s)	19.0	53.0		7.0	41.0		6.0	35.0		7.0	36.0	36.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		26.0			25.0			28.0			29.0	29.0
Pedestrian Calls (#/hr)		5			5			5			5	5
Act Effct Green (s)	18.0	53.0		7.0	42.0		6.0	35.0		7.0	36.0	36.0
Actuated g/C Ratio	0.15	0.44		0.06	0.35		0.05	0.29		0.06	0.30	0.30
v/c Ratio	0.86	0.96		0.92	0.80		0.97	0.30		0.83	0.63	0.28
Control Delay	81.0	35.5		111.2	28.5		118.7	29.5		73.8	23.5	2.5
Queue Delay	0.0	5.3		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	81.0	40.7		111.2	28.5		118.7	29.5		73.8	23.5	2.5
LOS	F	D		F	C		F	C		E	C	A
Approach Delay		44.6			32.7			60.7			30.7	
Approach LOS		D			C			E			C	
Queue Length 50th (ft)	183	378		75	205		67	84		69	151	3
Queue Length 95th (ft)	m#296	#689		#181	221		#137	122		#131	225	31
Internal Link Dist (ft)		187			251			812			465	
Turn Bay Length (ft)				200			170			210		
Base Capacity (vph)	280	2233		103	2232		171	1021		200	558	591
Starvation Cap Reductn	0	76		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.81	1.00		0.92	0.80		0.97	0.30		0.83	0.63	0.28

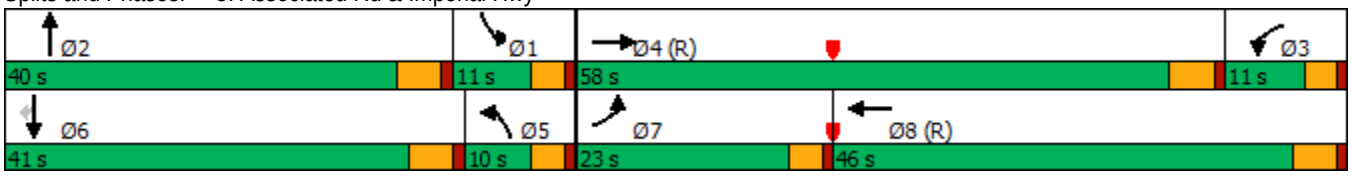
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 40.1		Intersection LOS: D	
Intersection Capacity Utilization 80.3%		ICU Level of Service D	
Analysis Period (min) 15			

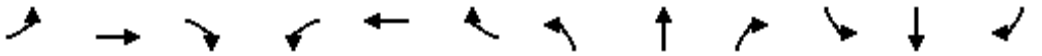
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

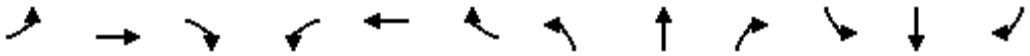
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Associated Rd & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	1823	359	172	1484	32	179	11	142	25	28	13
Future Volume (vph)	12	1823	359	172	1484	32	179	11	142	25	28	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140		200	225		0	195		0	85		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.997				0.850		0.953	
Flt Protected	0.950			0.950			0.950	0.958		0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5070	0	1681	1695	1583	1770	1775	0
Flt Permitted	0.950			0.950			0.950	0.958		0.950		
Satd. Flow (perm)	1770	5085	1583	1770	5070	0	1681	1695	1583	1770	1775	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			264		4				171		14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1111			1324			560			455	
Travel Time (s)		25.3			30.1			12.7			10.3	
Peak Hour Factor	0.95	0.95	0.95	0.89	0.89	0.89	0.83	0.83	0.83	0.67	0.67	0.67
Adj. Flow (vph)	13	1919	378	193	1667	36	216	13	171	37	42	19
Shared Lane Traffic (%)							47%					
Lane Group Flow (vph)	13	1919	378	193	1703	0	114	115	171	37	61	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	33.0	33.0	10.0	26.0		27.0	27.0	27.0	11.0	11.0	
Total Split (s)	10.0	59.0	59.0	23.0	72.0		27.0	27.0	27.0	11.0	11.0	
Total Split (%)	8.3%	49.2%	49.2%	19.2%	60.0%		22.5%	22.5%	22.5%	9.2%	9.2%	
Maximum Green (s)	6.0	54.0	54.0	19.0	67.0		22.0	22.0	22.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0			
Flash Dont Walk (s)		21.0	21.0		14.0		15.0	15.0	15.0			
Pedestrian Calls (#/hr)		5	5		5		5	5	5			
Act Effct Green (s)	6.0	56.2	56.2	16.8	73.0		22.0	22.0	22.0	6.0	6.0	
Actuated g/C Ratio	0.05	0.47	0.47	0.14	0.61		0.18	0.18	0.18	0.05	0.05	
v/c Ratio	0.15	0.81	0.43	0.78	0.55		0.37	0.37	0.40	0.42	0.60	
Control Delay	33.1	9.5	1.2	70.8	15.3		47.0	47.0	9.2	70.0	68.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	33.1	9.5	1.2	70.8	15.3		47.0	47.0	9.2	70.0	68.3	
LOS	C	A	A	E	B		D	D	A	E	E	
Approach Delay		8.2			20.9			30.8			68.9	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	9	117	0	144	240		82	83	0	28	36	
Queue Length 95th (ft)	m9	m127	m0	#225	346		130	131	46	48	58	
Internal Link Dist (ft)		1031			1244			480			375	
Turn Bay Length (ft)	140		200	225			195			85		
Base Capacity (vph)	88	2380	881	280	3085		308	310	429	88	102	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.15	0.81	0.43	0.69	0.55		0.37	0.37	0.40	0.42	0.60	

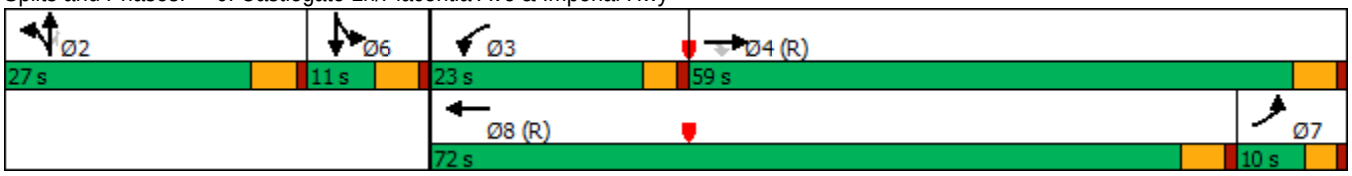
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 3 (3%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 16.5		Intersection LOS: B	
Intersection Capacity Utilization 68.3%		ICU Level of Service C	
Analysis Period (min) 15			

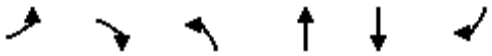
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

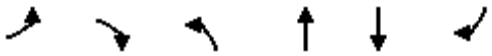
Splits and Phases: 6: Castlegate Ln/Placentia Ave & Imperial Hwy





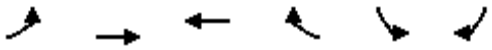
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	12	0	510	611	3
Future Volume (vph)	0	12	0	510	611	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.865			0.999	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3536	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3536	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	540			324	383	
Travel Time (s)	12.3			7.4	8.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	13	0	537	643	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	13	0	537	646	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.0%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	25	12	493	607	16
Future Volume (vph)	16	25	12	493	607	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	90			0
Storage Lanes	1	1	1			0
Taper Length (ft)	60		60			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.996	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3525	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3525	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	192			545	324	
Travel Time (s)	4.4			12.4	7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	26	13	519	639	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	26	13	519	656	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.3%		ICU Level of Service A	
Analysis Period (min) 15			

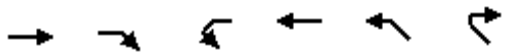


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2170	1909	10	0	9
Future Volume (vph)	0	2170	1909	10	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6401	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6401	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		285	267		252	
Travel Time (s)		6.5	6.1		5.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2284	2009	11	0	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2284	2020	0	0	9
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.8%		ICU Level of Service A	
Analysis Period (min) 15			

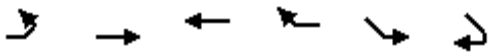
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	1473	548	0	2138	468	0	0	0	0	0	0
Future Volume (vph)	0	1473	548	0	2138	468	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.959				0.850						
Flt Protected												
Satd. Flow (prot)	0	6145	0	0	5085	1583	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	6145	0	0	5085	1583	0	0	0	0	0	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		563			192			626			545	
Travel Time (s)		12.8			4.4			14.2			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1473	548	0	2138	468	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2021	0	0	2138	468	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.6%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	1494	796	0	2450	0	0
Future Volume (vph)	1494	796	0	2450	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	5085	1583	0	5085	0	0
Flt Permitted						
Satd. Flow (perm)	5085	1583	0	5085	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	355			420	859	
Travel Time (s)	8.1			9.5	19.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1494	796	0	2450	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1494	796	0	2450	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.6%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	2074	1949	189	0	0
Future Volume (vph)	0	2074	1949	189	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.987			
Flt Protected						
Satd. Flow (prot)	0	5085	5019	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	5085	5019	0	0	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		362	563		627	
Travel Time (s)		8.2	12.8		14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2074	1949	189	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2074	2138	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.8%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	0	704	774	5
Future Vol, veh/h	0	5	0	704	774	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	0	741	815	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	410	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	591	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	591	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	591	-	-
HCM Lane V/C Ratio	-	0.009	-	-
HCM Control Delay (s)	-	11.1	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

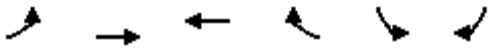
Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	121	18	668	745	34
Future Vol, veh/h	36	121	18	668	745	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	127	19	703	784	36

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1192	410	820	0	-	0
Stage 1	802	-	-	-	-	-
Stage 2	390	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	180	591	805	-	-	-
Stage 1	402	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	176	591	805	-	-	-
Mov Cap-2 Maneuver	176	-	-	-	-	-
Stage 1	392	-	-	-	-	-
Stage 2	653	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0.3	0
HCM LOS	C		

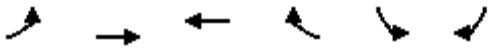
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	805	-	176	591	-	-
HCM Lane V/C Ratio	0.024	-	0.215	0.216	-	-
HCM Control Delay (s)	9.6	-	31	12.8	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	0.8	-	-



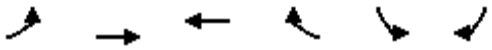
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2221	2149	31	0	44
Future Volume (Veh/h)	0	2221	2149	31	0	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	2338	2262	33	0	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		285	267			
pX, platoon unblocked	0.71				0.82	0.71
vC, conflicting volume	2295				2863	582
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	750				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	603				836	765

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	584	584	584	584	646	646	646	356	46
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	33	46
cSH	1700	1700	1700	1700	1700	1700	1700	1700	765
Volume to Capacity	0.34	0.34	0.34	0.34	0.38	0.38	0.38	0.21	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Lane LOS									B
Approach Delay (s)	0.0				0.0				10.0
Approach LOS									B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1682	2424	0	651	548
Future Volume (vph)	0	1682	2424	0	651	548
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	260
Storage Lanes	0			0	2	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.969	0.850
Flt Protected					0.962	
Satd. Flow (prot)	0	5085	5085	0	3369	1441
Flt Permitted					0.962	
Satd. Flow (perm)	0	5085	5085	0	3369	1441
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					2	2
Link Speed (mph)		30	30		30	
Link Distance (ft)		420	362		866	
Travel Time (s)		9.5	8.2		19.7	
Peak Hour Factor	0.95	0.95	0.97	0.97	0.94	0.94
Adj. Flow (vph)	0	1771	2499	0	693	583
Shared Lane Traffic (%)						31%
Lane Group Flow (vph)	0	1771	2499	0	874	402
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		4	8		6	6
Permitted Phases						



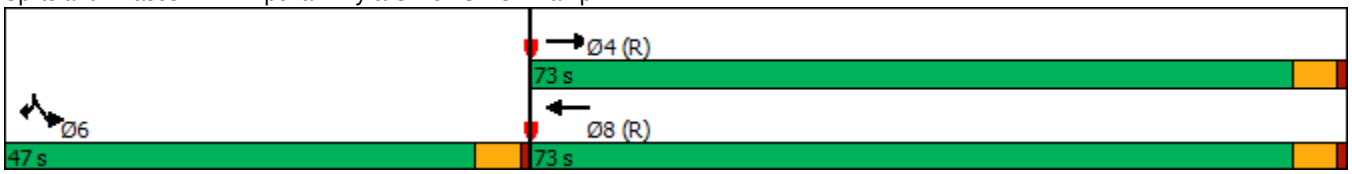
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		6.0	6.0		6.0	6.0
Minimum Split (s)		11.0	27.0		11.0	11.0
Total Split (s)		73.0	73.0		47.0	47.0
Total Split (%)		60.8%	60.8%		39.2%	39.2%
Maximum Green (s)		68.0	68.0		42.0	42.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		Max	Max
Walk Time (s)			7.0			
Flash Dont Walk (s)			15.0			
Pedestrian Calls (#/hr)			5			
Act Effct Green (s)		68.0	68.0		42.0	42.0
Actuated g/C Ratio		0.57	0.57		0.35	0.35
v/c Ratio		0.61	0.87		0.74	0.80
Control Delay		18.5	16.6		38.7	48.3
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		18.5	16.6		38.7	48.3
LOS		B	B		D	D
Approach Delay		18.5	16.6		41.7	
Approach LOS		B	B		D	
Queue Length 50th (ft)		317	288		303	304
Queue Length 95th (ft)		365	309		379	#481
Internal Link Dist (ft)		340	282		786	
Turn Bay Length (ft)						260
Base Capacity (vph)		2881	2881		1180	505
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.61	0.87		0.74	0.80

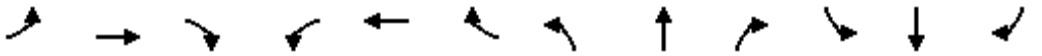
Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 5 (4%), Referenced to phase 4:EBT and 8:WBT, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 23.0	Intersection LOS: C
Intersection Capacity Utilization 79.5%	ICU Level of Service D
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.

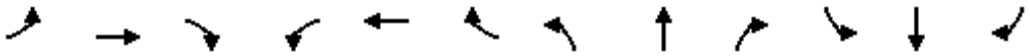
Queue shown is maximum after two cycles.

Splits and Phases: 1: Imperial Hwy & SR-57 SB Off-Ramp





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	1805	0	0	2363	38	1090	64	413	0	0	192
Future Volume (vph)	182	1805	0	0	2363	38	1090	64	413	0	0	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		350	0		0
Storage Lanes	1		0	0		0	2		1	0		2
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86	0.86	0.91	0.86	0.95	1.00	1.00	0.88
Frt					0.998			0.980	0.850			0.850
Flt Protected	0.950						0.950	0.966				
Satd. Flow (prot)	1770	5085	0	0	6395	0	3221	1517	1504	0	0	2787
Flt Permitted	0.950						0.950	0.966				
Satd. Flow (perm)	1770	5085	0	0	6395	0	3221	1517	1504	0	0	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			7	55			64
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		192			285			643			368	
Travel Time (s)		4.4			6.5			14.6			8.4	
Peak Hour Factor	0.95	0.95	0.95	0.98	0.98	0.98	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	192	1900	0	0	2411	39	1147	67	435	0	0	218
Shared Lane Traffic (%)							26%		13%			
Lane Group Flow (vph)	192	1900	0	0	2450	0	849	422	378	0	0	218
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			1
Detector Template	Left	Thru			Thru		Left	Thru	Right			Right
Leading Detector (ft)	20	100			100		20	100	20			20
Trailing Detector (ft)	0	0			0		0	0	0			0
Detector 1 Position(ft)	0	0			0		0	0	0			0
Detector 1 Size(ft)	20	6			6		20	6	20			20
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Prot	NA			NA		Split	NA	Prot			Over
Protected Phases	7	4			8		2	2	2			7
Permitted Phases												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4			8		2	2	2			7
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0		6.0	6.0	6.0			6.0
Minimum Split (s)	10.0	34.0			31.0		11.0	11.0	11.0			10.0
Total Split (s)	21.0	76.0			55.0		44.0	44.0	44.0			21.0
Total Split (%)	17.5%	63.3%			45.8%		36.7%	36.7%	36.7%			17.5%
Maximum Green (s)	17.0	71.0			50.0		39.0	39.0	39.0			17.0
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0			3.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0	1.0			1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Total Lost Time (s)	4.0	5.0			5.0		5.0	5.0	5.0			4.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Recall Mode	None	C-Max			C-Max		Max	Max	Max			None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		22.0			19.0							
Pedestrian Calls (#/hr)		5			5							
Act Effct Green (s)	15.9	71.0			51.1		39.0	39.0	39.0			15.9
Actuated g/C Ratio	0.13	0.59			0.43		0.32	0.32	0.32			0.13
v/c Ratio	0.82	0.63			0.90		0.81	0.85	0.72			0.51
Control Delay	75.3	17.3			12.2		44.5	54.4	39.3			38.2
Queue Delay	0.0	0.2			0.3		0.0	0.0	0.1			0.0
Total Delay	75.3	17.5			12.5		44.5	54.4	39.3			38.2
LOS	E	B			B		D	D	D			D
Approach Delay		22.8			12.5			45.8			38.2	
Approach LOS		C			B			D			D	
Queue Length 50th (ft)	144	291			143		330	347	233			62
Queue Length 95th (ft)	m#248	355			m147		415	#553	358			103
Internal Link Dist (ft)		112			205			563			288	
Turn Bay Length (ft)									350			
Base Capacity (vph)	250	3008			2723		1046	497	525			449
Starvation Cap Reductn	0	0			38		0	0	0			0
Spillback Cap Reductn	0	336			0		0	0	3			0
Storage Cap Reductn	0	0			0		0	0	0			0
Reduced v/c Ratio	0.77	0.71			0.91		0.81	0.85	0.72			0.49

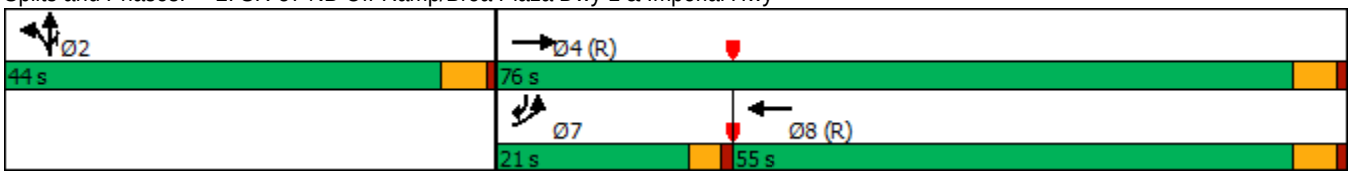
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 119 (99%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 25.3		Intersection LOS: C	
Intersection Capacity Utilization 80.7%		ICU Level of Service D	
Analysis Period (min) 15			

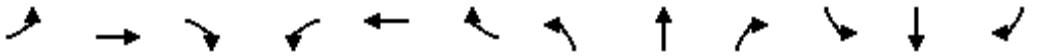
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

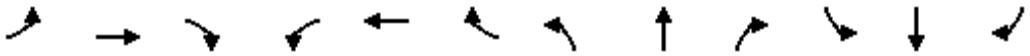
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR-57 NB Off-Ramp/Brea Plaza Dwy 1 & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	874	286	283	1241	16	460	32	342	10	20	6
Future Volume (vph)	12	874	286	283	1241	16	460	32	342	10	20	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	220		0	225		230	100		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.963			0.998				0.850		0.966	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3408	0	3433	3532	0	3433	1863	1583	1770	1799	0
Flt Permitted	0.950			0.950			0.950			0.735		
Satd. Flow (perm)	1770	3408	0	3433	3532	0	3433	1863	1583	1369	1799	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			1				55		7	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		664			723			1874			318	
Travel Time (s)		15.1			16.4			42.6			7.2	
Peak Hour Factor	0.99	0.99	0.99	0.94	0.94	0.94	0.94	0.94	0.94	0.85	0.85	0.85
Adj. Flow (vph)	12	883	289	301	1320	17	489	34	364	12	24	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1172	0	301	1337	0	489	34	364	12	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8		5	2	3		6	
Permitted Phases									2	6		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	3	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	39.0		10.0	38.0		10.0	38.0	10.0	38.0	38.0	
Total Split (s)	10.0	45.0		15.0	50.0		22.0	60.0	15.0	38.0	38.0	
Total Split (%)	8.3%	37.5%		12.5%	41.7%		18.3%	50.0%	12.5%	31.7%	31.7%	
Maximum Green (s)	6.0	40.0		11.0	45.0		18.0	55.0	11.0	33.0	33.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0	4.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	None	Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		27.0			26.0			26.0		26.0	26.0	
Pedestrian Calls (#/hr)		5			5			5		5	5	
Act Effct Green (s)	6.0	40.0		11.0	51.0		18.0	55.0	71.0	33.0	33.0	
Actuated g/C Ratio	0.05	0.33		0.09	0.42		0.15	0.46	0.59	0.28	0.28	
v/c Ratio	0.14	1.01		0.96	0.89		0.95	0.04	0.38	0.03	0.06	
Control Delay	58.2	67.2		95.8	41.4		74.9	16.4	10.0	32.3	27.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	58.2	67.2		95.8	41.4		74.9	16.4	10.0	32.3	27.0	
LOS	E	E		F	D		E	B	B	C	C	
Approach Delay		67.1			51.4			46.1			28.5	
Approach LOS		E			D			D			C	
Queue Length 50th (ft)	9	~472		121	463		181	15	123	7	14	
Queue Length 95th (ft)	30	#627		#210	#711		#290	34	184	21	36	
Internal Link Dist (ft)		584			643			1794			238	
Turn Bay Length (ft)	150			220			225		230	100		
Base Capacity (vph)	88	1162		314	1501		514	853	959	376	499	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.14	1.01		0.96	0.89		0.95	0.04	0.38	0.03	0.06	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 81 (68%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 54.8		Intersection LOS: D	
Intersection Capacity Utilization 72.8%		ICU Level of Service C	
Analysis Period (min) 15			

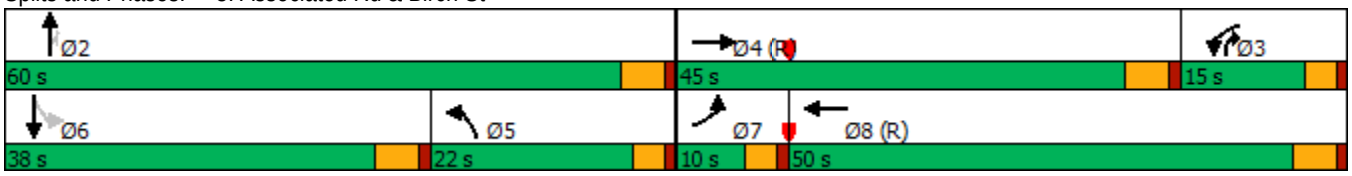
~ Volume exceeds capacity, queue is theoretically infinite.

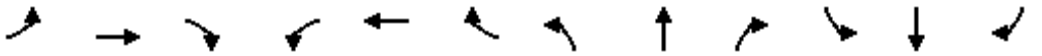
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

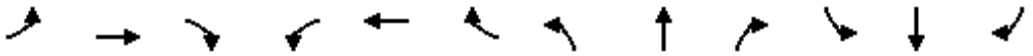
Queue shown is maximum after two cycles.

Splits and Phases: 3: Associated Rd & Birch St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	9	102	27	4	35	51	522	37	16	547	9
Future Volume (vph)	24	9	102	27	4	35	51	522	37	16	547	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	110		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.898			0.928			0.990			0.998	
Flt Protected		0.991			0.980		0.950			0.950		
Satd. Flow (prot)	0	1658	0	0	1694	0	1770	3504	0	1770	3532	0
Flt Permitted		0.923			0.577		0.421			0.425		
Satd. Flow (perm)	0	1544	0	0	997	0	784	3504	0	792	3532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		113			43			9			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		496			521			383			1874	
Travel Time (s)		11.3			11.8			8.7			42.6	
Peak Hour Factor	0.90	0.90	0.90	0.81	0.81	0.81	0.93	0.93	0.93	0.91	0.91	0.91
Adj. Flow (vph)	27	10	113	33	5	43	55	561	40	18	601	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	81	0	55	601	0	18	611	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

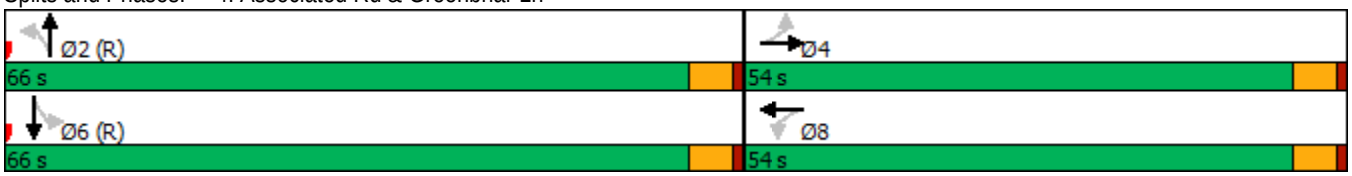


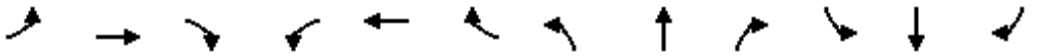
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		25.0	25.0		25.0	25.0	
Total Split (s)	54.0	54.0		54.0	54.0		66.0	66.0		66.0	66.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		55.0%	55.0%		55.0%	55.0%	
Maximum Green (s)	49.0	49.0		49.0	49.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0		25.0	25.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.9			12.9		97.1	97.1		97.1	97.1	
Actuated g/C Ratio		0.11			0.11		0.81	0.81		0.81	0.81	
v/c Ratio		0.56			0.56		0.09	0.21		0.03	0.21	
Control Delay		21.9			38.8		1.7	1.4		1.2	1.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		21.9			38.8		1.7	1.4		1.2	1.1	
LOS		C			D		A	A		A	A	
Approach Delay		21.9			38.8			1.4			1.1	
Approach LOS		C			D			A			A	
Queue Length 50th (ft)		28			29		2	12		0	1	
Queue Length 95th (ft)		76			56		m7	m37		m2	m55	
Internal Link Dist (ft)		416			441			303			1794	
Turn Bay Length (ft)							100			110		
Base Capacity (vph)		697			432		634	2838		641	2859	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.22			0.19		0.09	0.21		0.03	0.21	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 29 (24%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 5.3		Intersection LOS: A	
Intersection Capacity Utilization 41.8%		ICU Level of Service A	
Analysis Period (min) 15			

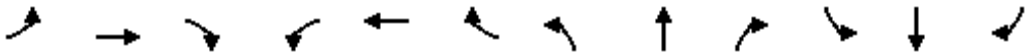
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Associated Rd & Greenbriar Ln





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	1820	139	172	1712	173	216	254	82	278	343	249
Future Volume (vph)	260	1820	139	172	1712	173	216	254	82	278	343	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	170		0	210		0
Storage Lanes	1		0	1		0	2		0	2		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	0.97	0.95	0.95	0.97	1.00	1.00
Frt		0.989			0.986			0.963				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5029	0	1770	6318	0	3433	3408	0	3433	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	5029	0	1770	6318	0	3433	3408	0	3433	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			20			37				300
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			331			892			545	
Travel Time (s)		6.1			7.5			20.3			12.4	
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.91	0.91	0.91	0.83	0.83	0.83
Adj. Flow (vph)	274	1916	146	183	1821	184	237	279	90	335	413	300
Shared Lane Traffic (%)												
Lane Group Flow (vph)	274	2062	0	183	2005	0	237	369	0	335	413	300
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	10.0	38.0		10.0	37.0		10.0	40.0		10.0	41.0	41.0
Total Split (s)	23.0	49.0		16.0	42.0		14.0	40.0		15.0	41.0	41.0
Total Split (%)	19.2%	40.8%		13.3%	35.0%		11.7%	33.3%		12.5%	34.2%	34.2%
Maximum Green (s)	19.0	44.0		12.0	37.0		10.0	35.0		11.0	36.0	36.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		26.0			25.0			28.0			29.0	29.0
Pedestrian Calls (#/hr)		5			5			5			5	5
Act Effct Green (s)	19.0	44.0		12.0	37.0		10.0	35.0		11.0	36.0	36.0
Actuated g/C Ratio	0.16	0.37		0.10	0.31		0.08	0.29		0.09	0.30	0.30
v/c Ratio	0.98	1.11		1.03	1.02		0.83	0.36		1.07	0.74	0.44
Control Delay	103.7	85.3		115.1	57.6		77.9	31.3		111.4	30.9	2.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	103.7	85.3		115.1	57.6		77.9	31.3		111.4	30.9	2.6
LOS	F	F		F	E		E	C		F	C	A
Approach Delay		87.5			62.4			49.5			48.5	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)	205	~673		~142	~374		94	106		~150	198	5
Queue Length 95th (ft)	m#380	#748		#297	#539		#161	151		#219	283	3
Internal Link Dist (ft)		187			251			812			465	
Turn Bay Length (ft)				200			170			210		
Base Capacity (vph)	280	1850		177	1961		286	1020		314	558	684
Starvation Cap Reductn	0	22		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.98	1.13		1.03	1.02		0.83	0.36		1.07	0.74	0.44

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 68.3		Intersection LOS: E	
Intersection Capacity Utilization 87.0%		ICU Level of Service E	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.

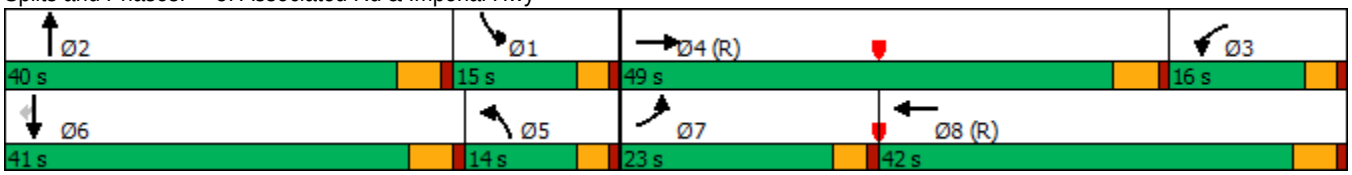
Queue shown is maximum after two cycles.

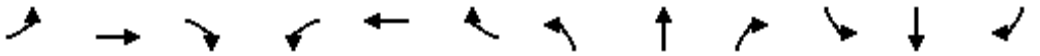
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

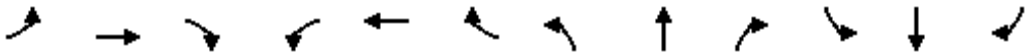
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Associated Rd & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1825	277	226	1873	56	248	46	261	25	23	13
Future Volume (vph)	19	1825	277	226	1873	56	248	46	261	25	23	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140		200	225		0	195		0	85		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.996				0.850		0.945	
Flt Protected	0.950			0.950			0.950	0.967		0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5065	0	1681	1711	1583	1770	1760	0
Flt Permitted	0.950			0.950			0.950	0.967		0.950		
Satd. Flow (perm)	1770	5085	1583	1770	5065	0	1681	1711	1583	1770	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			198		6				303		18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1111			1324			560			455	
Travel Time (s)		25.3			30.1			12.7			10.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.65	0.65	0.65
Adj. Flow (vph)	20	1921	292	238	1972	59	288	53	303	38	35	20
Shared Lane Traffic (%)							41%					
Lane Group Flow (vph)	20	1921	292	238	2031	0	170	171	303	38	55	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	33.0	33.0	10.0	26.0		27.0	27.0	27.0	11.0	11.0	
Total Split (s)	10.0	57.0	57.0	25.0	72.0		27.0	27.0	27.0	11.0	11.0	
Total Split (%)	8.3%	47.5%	47.5%	20.8%	60.0%		22.5%	22.5%	22.5%	9.2%	9.2%	
Maximum Green (s)	6.0	52.0	52.0	21.0	67.0		22.0	22.0	22.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0			
Flash Dont Walk (s)		21.0	21.0		14.0		15.0	15.0	15.0			
Pedestrian Calls (#/hr)		5	5		5		5	5	5			
Act Effct Green (s)	6.0	53.7	53.7	19.3	73.0		22.0	22.0	22.0	6.0	6.0	
Actuated g/C Ratio	0.05	0.45	0.45	0.16	0.61		0.18	0.18	0.18	0.05	0.05	
v/c Ratio	0.23	0.84	0.36	0.84	0.66		0.55	0.55	0.56	0.43	0.52	
Control Delay	25.5	3.8	0.3	73.3	17.3		52.2	51.9	9.2	70.7	58.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	25.5	3.8	0.3	73.3	17.3		52.2	51.9	9.2	70.7	58.3	
LOS	C	A	A	E	B		D	D	A	E	E	
Approach Delay		3.5			23.2			31.9			63.4	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	13	83	1	178	317		127	127	0	29	28	
Queue Length 95th (ft)	m13	m68	m0	#297	461		194	195	63	47	47	
Internal Link Dist (ft)		1031			1244			480			375	
Turn Bay Length (ft)	140		200	225			195			85		
Base Capacity (vph)	88	2274	817	309	3083		308	313	537	88	105	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.23	0.84	0.36	0.77	0.66		0.55	0.55	0.56	0.43	0.52	

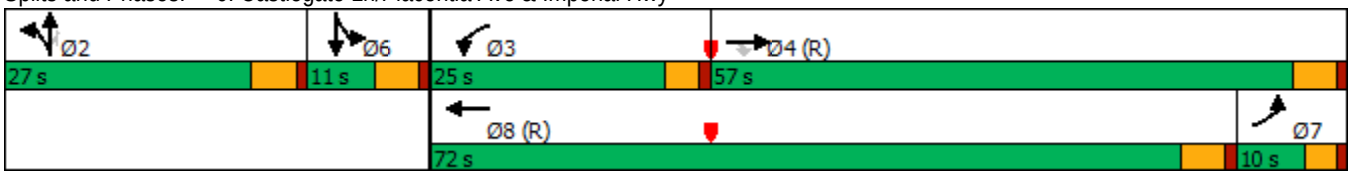
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 1 (1%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 74.2%		ICU Level of Service D	
Analysis Period (min) 15			

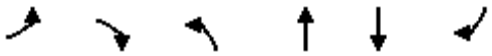
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

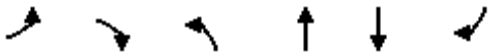
Splits and Phases: 6: Castlegate Ln/Placentia Ave & Imperial Hwy





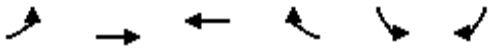
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	5	0	704	774	5
Future Volume (vph)	0	5	0	704	774	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.865			0.999	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3536	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3536	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	540			324	383	
Travel Time (s)	12.3			7.4	8.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	5	0	741	815	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	5	0	741	820	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.6%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	121	18	668	745	34
Future Volume (vph)	36	121	18	668	745	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	90			0
Storage Lanes	1	1	1			0
Taper Length (ft)	60		60			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.993	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3514	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3514	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	192			545	324	
Travel Time (s)	4.4			12.4	7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	127	19	703	784	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	127	19	703	820	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.8%		ICU Level of Service A	
Analysis Period (min) 15			

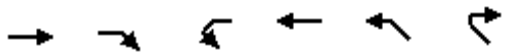


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2221	2149	31	0	44
Future Volume (vph)	0	2221	2149	31	0	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6395	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6395	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		285	267		252	
Travel Time (s)		6.5	6.1		5.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2338	2262	33	0	46
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2338	2295	0	0	46
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.7%		ICU Level of Service A	
Analysis Period (min) 15			

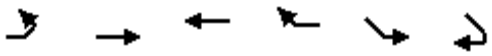
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	1987	371	0	2808	837	0	0	0	0	0	0
Future Volume (vph)	0	1987	371	0	2808	837	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976				0.850						
Flt Protected												
Satd. Flow (prot)	0	6254	0	0	5085	1583	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	6254	0	0	5085	1583	0	0	0	0	0	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		563			192			626			545	
Travel Time (s)		12.8			4.4			14.2			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1987	371	0	2808	837	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2358	0	0	2808	837	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	1682	1051	0	2972	0	0
Future Volume (vph)	1682	1051	0	2972	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	5085	1583	0	5085	0	0
Flt Permitted						
Satd. Flow (perm)	5085	1583	0	5085	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	355			420	859	
Travel Time (s)	8.1			9.5	19.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1682	1051	0	2972	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1682	1051	0	2972	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 68.4%		ICU Level of Service C	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	2333	2424	384	0	0
Future Volume (vph)	0	2333	2424	384	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.979			
Flt Protected						
Satd. Flow (prot)	0	5085	4979	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	5085	4979	0	0	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		362	563		627	
Travel Time (s)		8.2	12.8		14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2333	2424	384	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2333	2808	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 79.5%		ICU Level of Service D	
Analysis Period (min) 15			

APPENDIX F-III

YEAR 2045 GENERAL PLAN BUILDOUT TRAFFIC CONDITIONS

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	8	0	453	636	11
Future Vol, veh/h	0	8	0	453	636	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	8	0	453	636	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	324	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	672	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	672	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	672	-	-
HCM Lane V/C Ratio	-	0.012	-	-
HCM Control Delay (s)	-	10.4	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

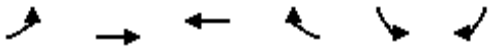
Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	20	11	446	631	13
Future Vol, veh/h	11	20	11	446	631	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	20	11	446	631	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	883	322	644	0	-	0
Stage 1	638	-	-	-	-	-
Stage 2	245	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	285	674	937	-	-	-
Stage 1	488	-	-	-	-	-
Stage 2	773	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	282	674	937	-	-	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	482	-	-	-	-	-
Stage 2	773	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	0.2	0
HCM LOS	B		

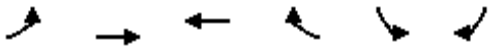
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	937	-	282	674	-	-
HCM Lane V/C Ratio	0.012	-	0.039	0.03	-	-
HCM Control Delay (s)	8.9	-	18.3	10.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-



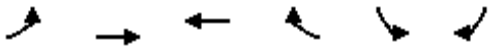
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2426	2088	9	0	9
Future Volume (Veh/h)	0	2426	2088	9	0	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	2426	2088	9	0	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		285	267			
pX, platoon unblocked	0.74				0.85	0.74
vC, conflicting volume	2097				2699	526
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	761				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	631				871	808

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	606	606	606	606	597	597	597	307	9
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	9	9
cSH	1700	1700	1700	1700	1700	1700	1700	1700	808
Volume to Capacity	0.36	0.36	0.36	0.36	0.35	0.35	0.35	0.18	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5
Lane LOS									A
Approach Delay (s)	0.0				0.0				9.5
Approach LOS									A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		



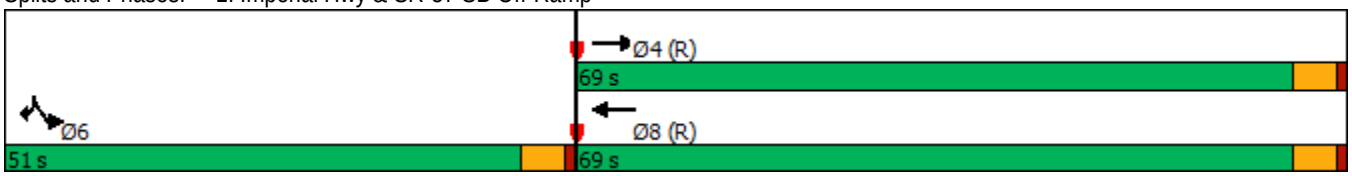
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1697	2020	0	606	562
Future Volume (vph)	0	1697	2020	0	606	562
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	260
Storage Lanes	0			0	2	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.963	0.850
Flt Protected					0.964	
Satd. Flow (prot)	0	5085	5085	0	3355	1441
Flt Permitted					0.964	
Satd. Flow (perm)	0	5085	5085	0	3355	1441
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					6	6
Link Speed (mph)		30	30		30	
Link Distance (ft)		420	362		866	
Travel Time (s)		9.5	8.2		19.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1697	2020	0	606	562
Shared Lane Traffic (%)						35%
Lane Group Flow (vph)	0	1697	2020	0	803	365
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		4	8		6	6
Permitted Phases						

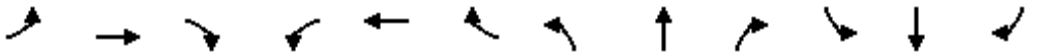


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		6.0	6.0		6.0	6.0
Minimum Split (s)		11.0	27.0		11.0	11.0
Total Split (s)		69.0	69.0		51.0	51.0
Total Split (%)		57.5%	57.5%		42.5%	42.5%
Maximum Green (s)		64.0	64.0		46.0	46.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		Max	Max
Walk Time (s)			7.0			
Flash Dont Walk (s)			15.0			
Pedestrian Calls (#/hr)			5			
Act Effct Green (s)		64.0	64.0		46.0	46.0
Actuated g/C Ratio		0.53	0.53		0.38	0.38
v/c Ratio		0.63	0.74		0.62	0.66
Control Delay		20.9	15.7		32.3	36.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		20.9	15.7		32.3	36.8
LOS		C	B		C	D
Approach Delay		20.9	15.7		33.7	
Approach LOS		C	B		C	
Queue Length 50th (ft)		323	408		255	249
Queue Length 95th (ft)		373	469		321	372
Internal Link Dist (ft)		340	282		786	
Turn Bay Length (ft)						260
Base Capacity (vph)		2712	2712		1289	556
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.63	0.74		0.62	0.66

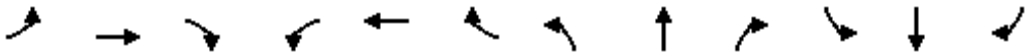
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 46 (38%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 21.8		Intersection LOS: C	
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Imperial Hwy & SR-57 SB Off-Ramp





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	1520	0	0	1615	18	1089	43	811	0	0	50
Future Volume (vph)	116	1520	0	0	1615	18	1089	43	811	0	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		350	0		0
Storage Lanes	1		0	0		0	2		1	0		2
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86	0.86	0.91	0.86	0.95	1.00	1.00	0.88
Frt					0.998			0.896	0.850			0.850
Flt Protected	0.950						0.950	0.989				
Satd. Flow (prot)	1770	5085	0	0	6395	0	3221	1420	1504	0	0	2787
Flt Permitted	0.950						0.950	0.989				
Satd. Flow (perm)	1770	5085	0	0	6395	0	3221	1420	1504	0	0	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					2			11	55			64
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		192			285			643			368	
Travel Time (s)		4.4			6.5			14.6			8.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	116	1520	0	0	1615	18	1089	43	811	0	0	50
Shared Lane Traffic (%)							10%		42%			
Lane Group Flow (vph)	116	1520	0	0	1633	0	980	493	470	0	0	50
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			1
Detector Template	Left	Thru			Thru		Left	Thru	Right			Right
Leading Detector (ft)	20	100			100		20	100	20			20
Trailing Detector (ft)	0	0			0		0	0	0			0
Detector 1 Position(ft)	0	0			0		0	0	0			0
Detector 1 Size(ft)	20	6			6		20	6	20			20
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Prot	NA			NA		Split	NA	Prot			Over
Protected Phases	7	4			8		2	2	2			7
Permitted Phases												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4			8		2	2	2			7
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0		6.0	6.0	6.0			6.0
Minimum Split (s)	10.0	34.0			31.0		11.0	11.0	11.0			10.0
Total Split (s)	15.0	59.0			44.0		61.0	61.0	61.0			15.0
Total Split (%)	12.5%	49.2%			36.7%		50.8%	50.8%	50.8%			12.5%
Maximum Green (s)	11.0	54.0			39.0		56.0	56.0	56.0			11.0
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0			3.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0	1.0			1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Total Lost Time (s)	4.0	5.0			5.0		5.0	5.0	5.0			4.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Recall Mode	None	C-Max			C-Max		Max	Max	Max			None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		22.0			19.0							
Pedestrian Calls (#/hr)		5			5							
Act Effct Green (s)	10.5	54.0			39.5		56.0	56.0	56.0			10.5
Actuated g/C Ratio	0.09	0.45			0.33		0.47	0.47	0.47			0.09
v/c Ratio	0.75	0.66			0.78		0.65	0.74	0.64			0.17
Control Delay	68.2	27.1			15.2		27.1	33.5	26.2			9.6
Queue Delay	0.0	0.1			0.0		0.0	0.0	0.0			0.0
Total Delay	68.2	27.2			15.2		27.1	33.5	26.2			9.6
LOS	E	C			B		C	C	C			A
Approach Delay		30.1			15.2			28.5			9.6	
Approach LOS		C			B			C			A	
Queue Length 50th (ft)	91	353			74		311	345	252			0
Queue Length 95th (ft)	m#171	428			120		388	511	380			15
Internal Link Dist (ft)		112			205			563			288	
Turn Bay Length (ft)									350			
Base Capacity (vph)	162	2288			2105		1503	668	731			313
Starvation Cap Reductn	0	0			0		0	0	0			0
Spillback Cap Reductn	0	135			0		0	0	1			0
Storage Cap Reductn	0	0			0		0	0	0			0
Reduced v/c Ratio	0.72	0.71			0.78		0.65	0.74	0.64			0.16

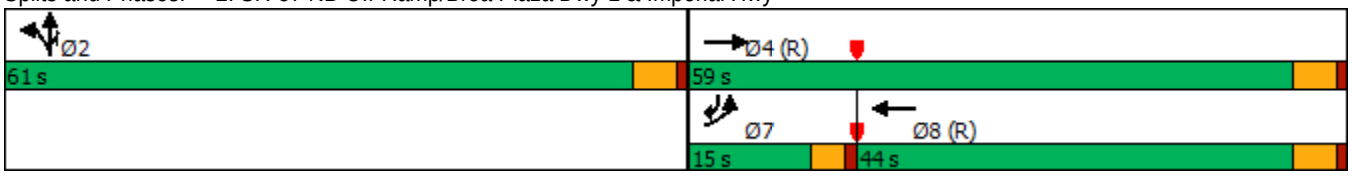
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 4 (3%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 24.7		Intersection LOS: C	
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

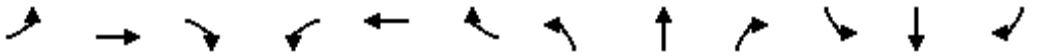
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

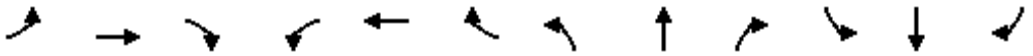
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR-57 NB Off-Ramp/Brea Plaza Dwy 1 & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	950	318	368	814	11	247	6	323	58	30	8
Future Volume (vph)	2	950	318	368	814	11	247	6	323	58	30	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	220		0	225		230	100		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.998				0.850		0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3405	0	3433	3532	0	3433	1863	1583	1770	1803	0
Flt Permitted	0.950			0.950			0.950			0.754		
Satd. Flow (perm)	1770	3405	0	3433	3532	0	3433	1863	1583	1405	1803	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		44			1				55		8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		664			723			1874			318	
Travel Time (s)		15.1			16.4			42.6			7.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	950	318	368	814	11	247	6	323	58	30	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	1268	0	368	825	0	247	6	323	58	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8		5	2	3		6	
Permitted Phases									2	6		



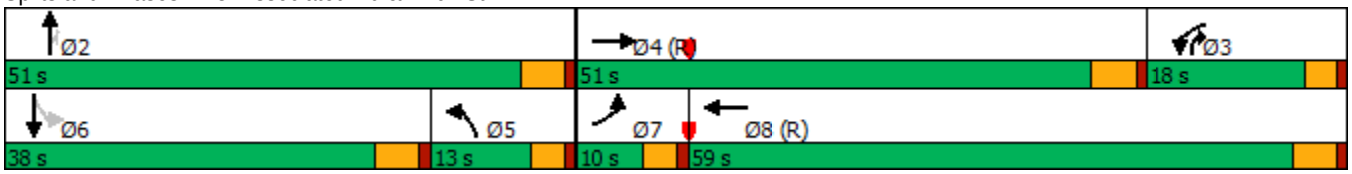
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	3	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	39.0		10.0	38.0		10.0	38.0	10.0	38.0	38.0	
Total Split (s)	10.0	51.0		18.0	59.0		13.0	51.0	18.0	38.0	38.0	
Total Split (%)	8.3%	42.5%		15.0%	49.2%		10.8%	42.5%	15.0%	31.7%	31.7%	
Maximum Green (s)	6.0	46.0		14.0	54.0		9.0	46.0	14.0	33.0	33.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0	4.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	None	Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		27.0			26.0			26.0		26.0	26.0	
Pedestrian Calls (#/hr)		5			5			5		5	5	
Act Effct Green (s)	6.0	46.0		14.0	62.0		9.0	46.0	65.0	33.0	33.0	
Actuated g/C Ratio	0.05	0.38		0.12	0.52		0.08	0.38	0.54	0.28	0.28	
v/c Ratio	0.02	0.95		0.92	0.45		0.96	0.01	0.37	0.15	0.08	
Control Delay	55.0	50.6		81.5	19.8		94.9	18.0	9.4	34.3	27.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	55.0	50.6		81.5	19.8		94.9	18.0	9.4	34.3	27.4	
LOS	D	D		F	B		F	B	A	C	C	
Approach Delay		50.6			38.8			46.1			31.6	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	2	483		147	196		98	2	55	34	17	
Queue Length 95th (ft)	11	#637		#238	295		#181	11	153	70	45	
Internal Link Dist (ft)		584			643			1794			238	
Turn Bay Length (ft)	150			220			225		230	100		
Base Capacity (vph)	88	1332		400	1825		257	714	882	386	501	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.02	0.95		0.92	0.45		0.96	0.01	0.37	0.15	0.08	

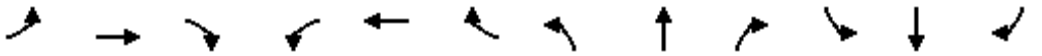
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 74 (62%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 44.7		Intersection LOS: D	
Intersection Capacity Utilization 73.1%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.

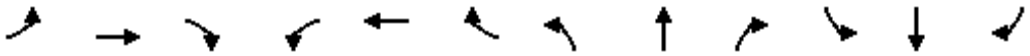
Queue shown is maximum after two cycles.

Splits and Phases: 3: Associated Rd & Birch St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1	38	44	8	42	56	413	16	20	492	22
Future Volume (vph)	19	1	38	44	8	42	56	413	16	20	492	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	110		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.912			0.940			0.994			0.994	
Flt Protected		0.984			0.977		0.950			0.950		
Satd. Flow (prot)	0	1672	0	0	1711	0	1770	3518	0	1770	3518	0
Flt Permitted		0.886			0.845		0.462			0.502		
Satd. Flow (perm)	0	1505	0	0	1480	0	861	3518	0	935	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			37			5			6	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		496			521			383			1874	
Travel Time (s)		11.3			11.8			8.7			42.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	19	1	38	44	8	42	56	413	16	20	492	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	0	0	94	0	56	429	0	20	514	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		



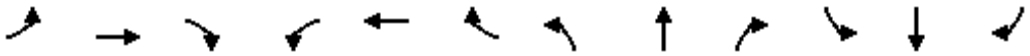
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		25.0	25.0		25.0	25.0	
Total Split (s)	47.0	47.0		47.0	47.0		73.0	73.0		73.0	73.0	
Total Split (%)	39.2%	39.2%		39.2%	39.2%		60.8%	60.8%		60.8%	60.8%	
Maximum Green (s)	42.0	42.0		42.0	42.0		68.0	68.0		68.0	68.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0		25.0	25.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		13.6			13.6		96.4	96.4		96.4	96.4	
Actuated g/C Ratio		0.11			0.11		0.80	0.80		0.80	0.80	
v/c Ratio		0.28			0.47		0.08	0.15		0.03	0.18	
Control Delay		22.7			36.1		2.3	1.7		0.9	0.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		22.7			36.1		2.3	1.7		0.9	0.7	
LOS		C			D		A	A		A	A	
Approach Delay		22.7			36.1			1.8			0.7	
Approach LOS		C			D			A			A	
Queue Length 50th (ft)		15			43		3	12		0	1	
Queue Length 95th (ft)		46			79		m10	m28		m2	m35	
Internal Link Dist (ft)		416			441			303			1794	
Turn Bay Length (ft)							100			110		
Base Capacity (vph)		551			542		691	2826		751	2826	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.11			0.17		0.08	0.15		0.03	0.18	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 15 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 5.1 Intersection LOS: A
Intersection Capacity Utilization 40.1% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Associated Rd & Greenbriar Ln

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	2166	106	96	1794	86	150	217	93	153	345	153
Future Volume (vph)	154	2166	106	96	1794	86	150	217	93	153	345	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	170		0	210		0
Storage Lanes	1		0	1		0	2		0	2		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	0.97	0.95	0.95	0.97	1.00	1.00
Frt		0.993			0.993			0.955				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5050	0	1770	6363	0	3433	3380	0	3433	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	5050	0	1770	6363	0	3433	3380	0	3433	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			9			56				153
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			331			892			545	
Travel Time (s)		6.1			7.5			20.3			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	154	2166	106	96	1794	86	150	217	93	153	345	153
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	2272	0	96	1880	0	150	310	0	153	345	153
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	10.0	38.0		10.0	37.0		10.0	40.0		10.0	41.0	41.0
Total Split (s)	22.0	58.0		11.0	47.0		10.0	40.0		11.0	41.0	41.0
Total Split (%)	18.3%	48.3%		9.2%	39.2%		8.3%	33.3%		9.2%	34.2%	34.2%
Maximum Green (s)	18.0	53.0		7.0	42.0		6.0	35.0		7.0	36.0	36.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		26.0			25.0			28.0			29.0	29.0
Pedestrian Calls (#/hr)		5			5			5			5	5
Act Effct Green (s)	15.0	53.0		7.0	45.0		6.0	35.0		7.0	36.0	36.0
Actuated g/C Ratio	0.12	0.44		0.06	0.38		0.05	0.29		0.06	0.30	0.30
v/c Ratio	0.70	1.02		0.93	0.79		0.88	0.30		0.77	0.62	0.26
Control Delay	72.8	45.6		114.9	27.2		99.4	27.7		63.4	23.0	2.1
Queue Delay	0.0	3.3		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	72.8	48.9		114.9	27.2		99.4	27.7		63.4	23.0	2.1
LOS	E	D		F	C		F	C		E	C	A
Approach Delay		50.4			31.5			51.1			27.6	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	123	~385		76	220		60	79		63	142	2
Queue Length 95th (ft)	m183	#756		#180	235		#123	119		#117	217	29
Internal Link Dist (ft)		187			251			812			465	
Turn Bay Length (ft)				200			170			210		
Base Capacity (vph)	265	2234		103	2392		171	1025		200	558	582
Starvation Cap Reductn	0	22		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.58	1.03		0.93	0.79		0.88	0.30		0.77	0.62	0.26

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 116 (97%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 41.0 Intersection LOS: D
Intersection Capacity Utilization 87.7% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

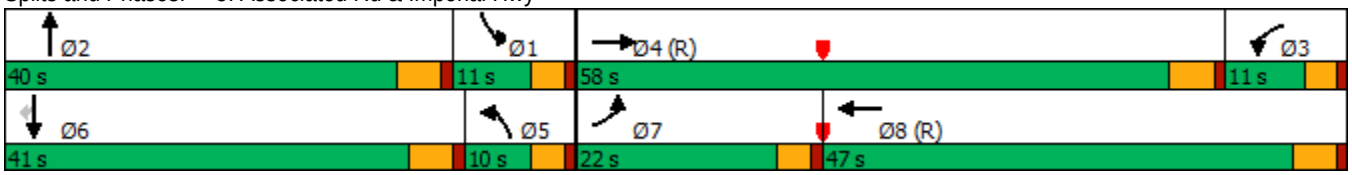
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

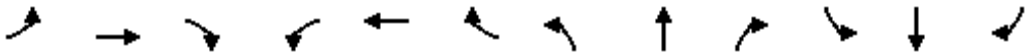
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Associated Rd & Imperial Hwy



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	2000	478	201	1643	34	191	12	149	26	29	14
Future Volume (vph)	14	2000	478	201	1643	34	191	12	149	26	29	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140		200	225		0	195		0	85		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.997				0.850		0.951	
Flt Protected	0.950			0.950			0.950	0.958		0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5070	0	1681	1695	1583	1770	1771	0
Flt Permitted	0.950			0.950			0.950	0.958		0.950		
Satd. Flow (perm)	1770	5085	1583	1770	5070	0	1681	1695	1583	1770	1771	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			320		4				149		14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1111			1324			560			455	
Travel Time (s)		25.3			30.1			12.7			10.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	2000	478	201	1643	34	191	12	149	26	29	14
Shared Lane Traffic (%)							47%					
Lane Group Flow (vph)	14	2000	478	201	1677	0	101	102	149	26	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	33.0	33.0	10.0	26.0		27.0	27.0	27.0	11.0	11.0	
Total Split (s)	10.0	59.0	59.0	23.0	72.0		27.0	27.0	27.0	11.0	11.0	
Total Split (%)	8.3%	49.2%	49.2%	19.2%	60.0%		22.5%	22.5%	22.5%	9.2%	9.2%	
Maximum Green (s)	6.0	54.0	54.0	19.0	67.0		22.0	22.0	22.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0			
Flash Dont Walk (s)		21.0	21.0		14.0		15.0	15.0	15.0			
Pedestrian Calls (#/hr)		5	5		5		5	5	5			
Act Effct Green (s)	6.0	55.8	55.8	17.2	73.0		22.0	22.0	22.0	6.0	6.0	
Actuated g/C Ratio	0.05	0.46	0.46	0.14	0.61		0.18	0.18	0.18	0.05	0.05	
v/c Ratio	0.16	0.85	0.53	0.79	0.54		0.33	0.33	0.36	0.30	0.43	
Control Delay	33.9	10.6	1.4	71.9	15.1		46.0	46.0	9.3	63.9	54.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	33.9	10.6	1.4	71.9	15.1		46.0	46.0	9.3	63.9	54.1	
LOS	C	B	A	E	B		D	D	A	E	D	
Approach Delay		9.0			21.2			30.5			57.8	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	9	128	0	150	235		72	72	0	20	22	
Queue Length 95th (ft)	m11	m128	m0	#251	344		129	130	57	51	61	
Internal Link Dist (ft)		1031			1244			480			375	
Turn Bay Length (ft)	140		200	225			195			85		
Base Capacity (vph)	88	2365	907	280	3085		308	310	411	88	101	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.16	0.85	0.53	0.72	0.54		0.33	0.33	0.36	0.30	0.43	

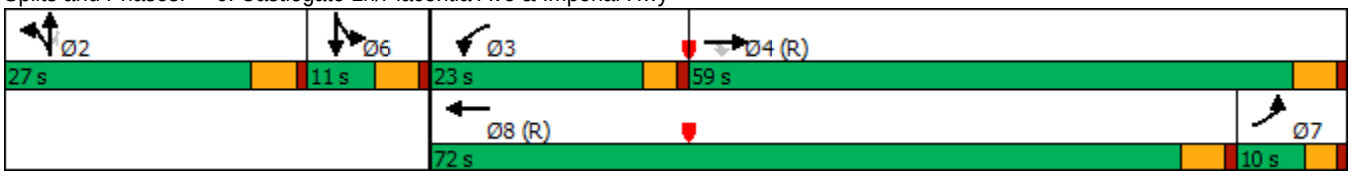
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 73.7%		ICU Level of Service D	
Analysis Period (min) 15			

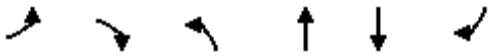
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

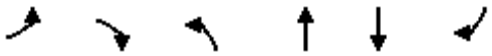
Splits and Phases: 6: Castlegate Ln/Placentia Ave & Imperial Hwy





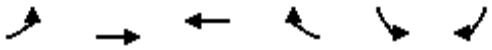
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	8	0	453	636	11
Future Volume (vph)	0	8	0	453	636	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.865			0.997	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3529	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3529	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	540			324	383	
Travel Time (s)	12.3			7.4	8.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	8	0	453	636	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	8	0	453	647	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.9%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	20	11	446	631	13
Future Volume (vph)	11	20	11	446	631	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	90			0
Storage Lanes	1	1	1			0
Taper Length (ft)	60		60			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.997	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3529	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3529	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	192			545	324	
Travel Time (s)	4.4			12.4	7.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	11	20	11	446	631	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	20	11	446	644	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.9%		ICU Level of Service A	
Analysis Period (min) 15			

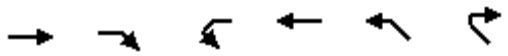


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2426	2088	9	0	9
Future Volume (vph)	0	2426	2088	9	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6401	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6401	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		285	267		252	
Travel Time (s)		6.5	6.1		5.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2426	2088	9	0	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2426	2097	0	0	9
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.4%		ICU Level of Service A	
Analysis Period (min) 15			

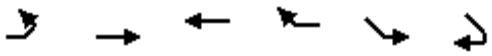
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	1636	575	0	2209	545	0	0	0	0	0	0
Future Volume (vph)	0	1636	575	0	2209	545	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961				0.850						
Flt Protected												
Satd. Flow (prot)	0	6158	0	0	5085	1583	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	6158	0	0	5085	1583	0	0	0	0	0	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		563			192			626			545	
Travel Time (s)		12.8			4.4			14.2			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1636	575	0	2209	545	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2211	0	0	2209	545	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.0%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	1697	836	0	2582	0	0
Future Volume (vph)	1697	836	0	2582	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	5085	1583	0	5085	0	0
Flt Permitted						
Satd. Flow (perm)	5085	1583	0	5085	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	355			420	859	
Travel Time (s)	8.1			9.5	19.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1697	836	0	2582	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1697	836	0	2582	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 55.1%		ICU Level of Service B	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	2303	2020	189	0	0
Future Volume (vph)	0	2303	2020	189	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.987			
Flt Protected						
Satd. Flow (prot)	0	5085	5019	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	5085	5019	0	0	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		362	563		627	
Travel Time (s)		8.2	12.8		14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2303	2020	189	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2303	2209	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	40	0	737	767	9
Future Vol, veh/h	0	40	0	737	767	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	40	0	737	767	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	388	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	611	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	611	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	611	-	-
HCM Lane V/C Ratio	-	0.065	-	-
HCM Control Delay (s)	-	11.3	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

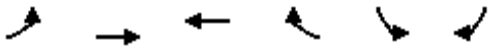
Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	41	124	15	694	775	33
Future Vol, veh/h	41	124	15	694	775	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	124	15	694	775	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1169	404	808	0	-	0
Stage 1	792	-	-	-	-	-
Stage 2	377	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	186	596	813	-	-	-
Stage 1	407	-	-	-	-	-
Stage 2	663	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	183	596	813	-	-	-
Mov Cap-2 Maneuver	183	-	-	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	663	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0.2	0
HCM LOS	C		

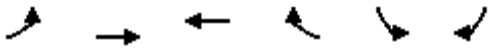
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	813	-	183	596	-	-
HCM Lane V/C Ratio	0.018	-	0.224	0.208	-	-
HCM Control Delay (s)	9.5	-	30.3	12.6	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	0.8	-	-



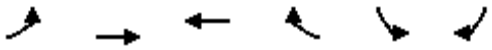
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2286	2377	35	0	48
Future Volume (Veh/h)	0	2286	2377	35	0	48
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	2286	2377	35	0	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		285	267			
pX, platoon unblocked	0.68				0.78	0.68
vC, conflicting volume	2412				2966	612
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	722				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	93
cM capacity (veh/h)	596				799	737

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	572	572	572	572	679	679	679	375	48
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	35	48
cSH	1700	1700	1700	1700	1700	1700	1700	1700	737
Volume to Capacity	0.34	0.34	0.34	0.34	0.40	0.40	0.40	0.22	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2
Lane LOS									B
Approach Delay (s)	0.0				0.0				10.2
Approach LOS									B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↰↰	↱
Traffic Volume (vph)	0	1889	2565	0	683	601
Future Volume (vph)	0	1889	2565	0	683	601
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	260
Storage Lanes	0			0	2	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.966	0.850
Flt Protected					0.963	
Satd. Flow (prot)	0	5085	5085	0	3362	1441
Flt Permitted					0.963	
Satd. Flow (perm)	0	5085	5085	0	3362	1441
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					2	2
Link Speed (mph)		30	30		30	
Link Distance (ft)		420	362		866	
Travel Time (s)		9.5	8.2		19.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1889	2565	0	683	601
Shared Lane Traffic (%)						33%
Lane Group Flow (vph)	0	1889	2565	0	881	403
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		4	8		6	6
Permitted Phases						



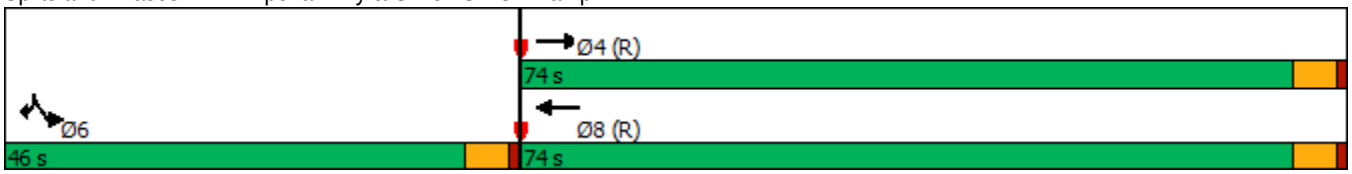
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		6.0	6.0		6.0	6.0
Minimum Split (s)		11.0	27.0		11.0	11.0
Total Split (s)		74.0	74.0		46.0	46.0
Total Split (%)		61.7%	61.7%		38.3%	38.3%
Maximum Green (s)		69.0	69.0		41.0	41.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		Max	Max
Walk Time (s)			7.0			
Flash Dont Walk (s)			15.0			
Pedestrian Calls (#/hr)			5			
Act Effct Green (s)		69.0	69.0		41.0	41.0
Actuated g/C Ratio		0.58	0.58		0.34	0.34
v/c Ratio		0.65	0.88		0.77	0.82
Control Delay		18.5	15.3		40.5	50.9
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		18.5	15.3		40.5	50.9
LOS		B	B		D	D
Approach Delay		18.5	15.3		43.7	
Approach LOS		B	B		D	
Queue Length 50th (ft)		344	274		311	309
Queue Length 95th (ft)		394	292		389	#494
Internal Link Dist (ft)		340	282		786	
Turn Bay Length (ft)						260
Base Capacity (vph)		2923	2923		1150	493
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.65	0.88		0.77	0.82

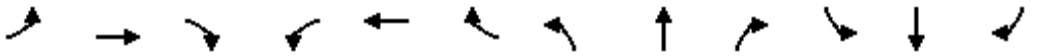
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 8 (7%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 22.7		Intersection LOS: C	
Intersection Capacity Utilization 83.7%		ICU Level of Service E	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.

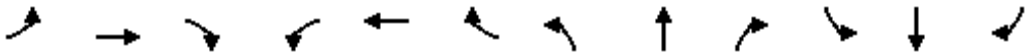
Queue shown is maximum after two cycles.

Splits and Phases: 1: Imperial Hwy & SR-57 SB Off-Ramp





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1799	0	0	2526	46	1143	72	430	0	0	231
Future Volume (vph)	206	1799	0	0	2526	46	1143	72	430	0	0	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		350	0		0
Storage Lanes	1		0	0		0	2		1	0		2
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86	0.86	0.91	0.86	0.95	1.00	1.00	0.88
Frt					0.997			0.981	0.850			0.850
Flt Protected	0.950						0.950	0.966				
Satd. Flow (prot)	1770	5085	0	0	6389	0	3221	1518	1504	0	0	2787
Flt Permitted	0.950						0.950	0.966				
Satd. Flow (perm)	1770	5085	0	0	6389	0	3221	1518	1504	0	0	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			6	55			64
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		192			285			643			368	
Travel Time (s)		4.4			6.5			14.6			8.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	206	1799	0	0	2526	46	1143	72	430	0	0	231
Shared Lane Traffic (%)							26%		12%			
Lane Group Flow (vph)	206	1799	0	0	2572	0	846	421	378	0	0	231
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			1
Detector Template	Left	Thru			Thru		Left	Thru	Right			Right
Leading Detector (ft)	20	100			100		20	100	20			20
Trailing Detector (ft)	0	0			0		0	0	0			0
Detector 1 Position(ft)	0	0			0		0	0	0			0
Detector 1 Size(ft)	20	6			6		20	6	20			20
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Prot	NA			NA		Split	NA	Prot			Over
Protected Phases	7	4			8		2	2	2			7
Permitted Phases												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4			8		2	2	2			7
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0		6.0	6.0	6.0			6.0
Minimum Split (s)	10.0	34.0			31.0		11.0	11.0	11.0			10.0
Total Split (s)	19.0	76.0			57.0		44.0	44.0	44.0			19.0
Total Split (%)	15.8%	63.3%			47.5%		36.7%	36.7%	36.7%			15.8%
Maximum Green (s)	15.0	71.0			52.0		39.0	39.0	39.0			15.0
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0			3.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0	1.0			1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Total Lost Time (s)	4.0	5.0			5.0		5.0	5.0	5.0			4.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Recall Mode	None	C-Max			C-Max		Max	Max	Max			None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		22.0			19.0							
Pedestrian Calls (#/hr)		5			5							
Act Effct Green (s)	15.0	71.0			52.0		39.0	39.0	39.0			15.0
Actuated g/C Ratio	0.12	0.59			0.43		0.32	0.32	0.32			0.12
v/c Ratio	0.93	0.60			0.93		0.81	0.85	0.72			0.57
Control Delay	91.4	18.0			12.0		44.3	54.3	39.3			41.6
Queue Delay	0.0	0.1			0.4		0.0	0.0	0.0			0.0
Total Delay	91.4	18.1			12.4		44.3	54.3	39.3			41.6
LOS	F	B			B		D	D	D			D
Approach Delay		25.7			12.4			45.7			41.6	
Approach LOS		C			B			D			D	
Queue Length 50th (ft)	160	277			134		328	347	233			69
Queue Length 95th (ft)	m#297	339			m135		413	#553	358			116
Internal Link Dist (ft)		112			205			563			288	
Turn Bay Length (ft)									350			
Base Capacity (vph)	221	3008			2770		1046	497	525			404
Starvation Cap Reductn	0	0			31		0	0	0			0
Spillback Cap Reductn	0	311			0		0	0	2			0
Storage Cap Reductn	0	0			0		0	0	0			0
Reduced v/c Ratio	0.93	0.67			0.94		0.81	0.85	0.72			0.57

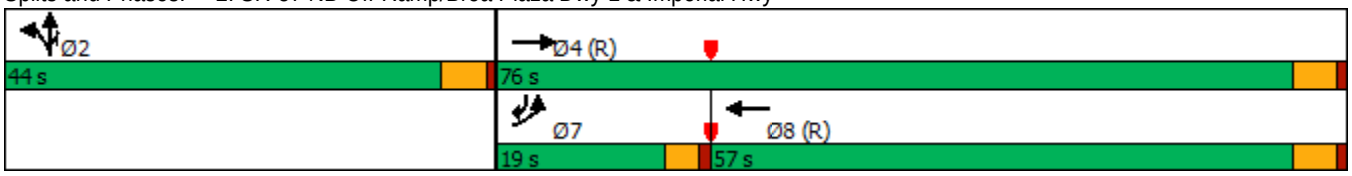
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 26.1		Intersection LOS: C	
Intersection Capacity Utilization 85.7%		ICU Level of Service E	
Analysis Period (min) 15			

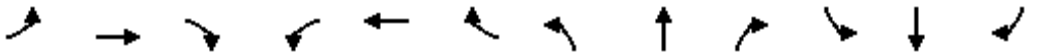
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

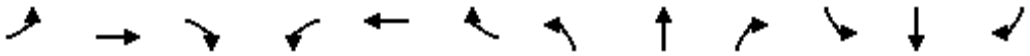
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR-57 NB Off-Ramp/Brea Plaza Dwy 1 & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	889	300	300	1248	17	483	34	368	11	21	6
Future Volume (vph)	12	889	300	300	1248	17	483	34	368	11	21	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	220		0	225		230	100		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.998				0.850		0.967	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3405	0	3433	3532	0	3433	1863	1583	1770	1801	0
Flt Permitted	0.950			0.950			0.950			0.735		
Satd. Flow (perm)	1770	3405	0	3433	3532	0	3433	1863	1583	1369	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			1				55		6	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		664			723			1874			318	
Travel Time (s)		15.1			16.4			42.6			7.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	12	889	300	300	1248	17	483	34	368	11	21	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1189	0	300	1265	0	483	34	368	11	27	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8		5	2	3		6	
Permitted Phases									2	6		



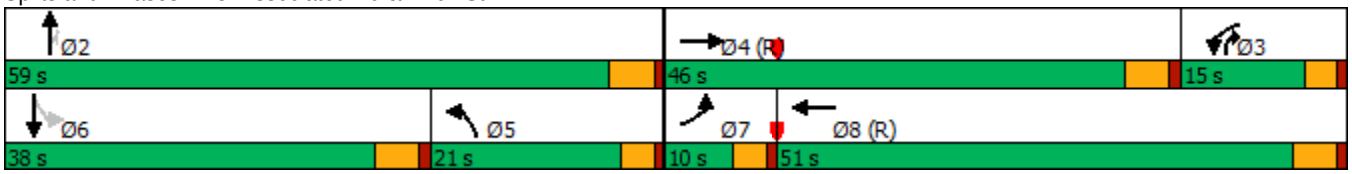
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	3	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	39.0		10.0	38.0		10.0	38.0	10.0	38.0	38.0	
Total Split (s)	10.0	46.0		15.0	51.0		21.0	59.0	15.0	38.0	38.0	
Total Split (%)	8.3%	38.3%		12.5%	42.5%		17.5%	49.2%	12.5%	31.7%	31.7%	
Maximum Green (s)	6.0	41.0		11.0	46.0		17.0	54.0	11.0	33.0	33.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0	4.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	None	Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		27.0			26.0			26.0		26.0	26.0	
Pedestrian Calls (#/hr)		5			5			5		5	5	
Act Effct Green (s)	6.0	41.0		11.0	52.0		17.0	54.0	70.0	33.0	33.0	
Actuated g/C Ratio	0.05	0.34		0.09	0.43		0.14	0.45	0.58	0.28	0.28	
v/c Ratio	0.14	1.00		0.96	0.83		0.99	0.04	0.39	0.03	0.05	
Control Delay	58.2	64.0		95.1	36.5		86.5	16.4	10.7	32.3	27.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	58.2	64.0		95.1	36.5		86.5	16.4	10.7	32.3	27.1	
LOS	E	E		F	D		F	B	B	C	C	
Approach Delay		64.0			47.8			52.3			28.6	
Approach LOS		E			D			D			C	
Queue Length 50th (ft)	9	468		121	417		197	14	113	6	12	
Queue Length 95th (ft)	30	#630		#209	#636		#315	29	148	21	36	
Internal Link Dist (ft)		584			643			1794			238	
Turn Bay Length (ft)	150			220			225		230	100		
Base Capacity (vph)	88	1191		314	1530		486	838	946	376	499	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.14	1.00		0.96	0.83		0.99	0.04	0.39	0.03	0.05	

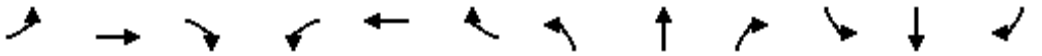
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 86 (72%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 53.9		Intersection LOS: D	
Intersection Capacity Utilization 74.8%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.

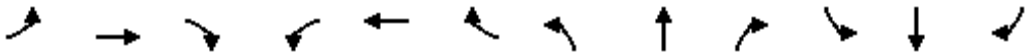
Queue shown is maximum after two cycles.

Splits and Phases: 3: Associated Rd & Birch St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	9	42	28	4	37	44	560	39	17	579	18
Future Volume (vph)	36	9	42	28	4	37	44	560	39	17	579	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	110		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.935			0.928			0.990			0.995	
Flt Protected		0.980			0.980		0.950			0.950		
Satd. Flow (prot)	0	1707	0	0	1694	0	1770	3504	0	1770	3522	0
Flt Permitted		0.839			0.829		0.426			0.426		
Satd. Flow (perm)	0	1461	0	0	1433	0	794	3504	0	794	3522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			37			9			4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		496			521			383			1874	
Travel Time (s)		11.3			11.8			8.7			42.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	36	9	42	28	4	37	44	560	39	17	579	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	87	0	0	69	0	44	599	0	17	597	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

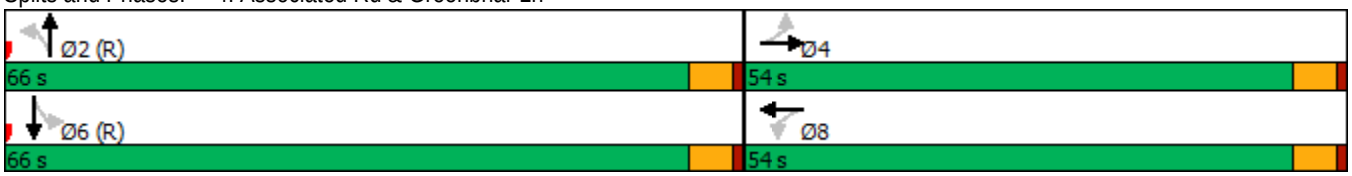


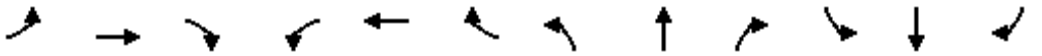
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		25.0	25.0		25.0	25.0	
Total Split (s)	54.0	54.0		54.0	54.0		66.0	66.0		66.0	66.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		55.0%	55.0%		55.0%	55.0%	
Maximum Green (s)	49.0	49.0		49.0	49.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0		25.0	25.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		13.0			13.0		97.0	97.0		97.0	97.0	
Actuated g/C Ratio		0.11			0.11		0.81	0.81		0.81	0.81	
v/c Ratio		0.45			0.37		0.07	0.21		0.03	0.21	
Control Delay		32.3			28.9		4.6	3.5		0.2	0.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		32.3			28.9		4.6	3.5		0.2	0.3	
LOS		C			C		A	A		A	A	
Approach Delay		32.3			28.9			3.6			0.3	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		34			24		4	31		0	1	
Queue Length 95th (ft)		69			57		m12	m64		m0	m2	
Internal Link Dist (ft)		416			441			303			1794	
Turn Bay Length (ft)							100			110		
Base Capacity (vph)		621			607		641	2833		641	2846	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.14			0.11		0.07	0.21		0.03	0.21	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 19 (16%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 5.2		Intersection LOS: A	
Intersection Capacity Utilization 40.8%		ICU Level of Service A	
Analysis Period (min) 15			

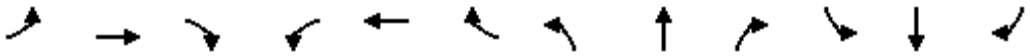
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Associated Rd & Greenbriar Ln





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	261	1879	146	210	1950	176	228	272	103	302	363	234
Future Volume (vph)	261	1879	146	210	1950	176	228	272	103	302	363	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	170		0	210		0
Storage Lanes	1		0	1		0	2		0	2		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	0.97	0.95	0.95	0.97	1.00	1.00
Frt		0.989			0.988			0.959				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5029	0	1770	6331	0	3433	3394	0	3433	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	5029	0	1770	6331	0	3433	3394	0	3433	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			18			46				234
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			331			892			545	
Travel Time (s)		6.1			7.5			20.3			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	261	1879	146	210	1950	176	228	272	103	302	363	234
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	2025	0	210	2126	0	228	375	0	302	363	234
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	10.0	38.0		10.0	37.0		10.0	40.0		10.0	41.0	41.0
Total Split (s)	21.0	49.0		17.0	45.0		13.0	40.0		14.0	41.0	41.0
Total Split (%)	17.5%	40.8%		14.2%	37.5%		10.8%	33.3%		11.7%	34.2%	34.2%
Maximum Green (s)	17.0	44.0		13.0	40.0		9.0	35.0		10.0	36.0	36.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		26.0			25.0			28.0			29.0	29.0
Pedestrian Calls (#/hr)		5			5			5			5	5
Act Effct Green (s)	17.0	44.0		13.0	40.0		9.0	35.0		10.0	36.0	36.0
Actuated g/C Ratio	0.14	0.37		0.11	0.33		0.08	0.29		0.08	0.30	0.30
v/c Ratio	1.04	1.09		1.10	1.00		0.89	0.37		1.06	0.65	0.37
Control Delay	125.5	77.0		129.2	50.8		88.5	30.6		108.7	30.8	3.4
Queue Delay	0.0	2.6		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	125.5	79.5		129.2	50.8		88.5	30.6		108.7	30.8	3.4
LOS	F	E		F	D		F	C		F	C	A
Approach Delay		84.8			57.9			52.5			49.8	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)	~215	~652		~178	~255		91	105		~135	178	4
Queue Length 95th (ft)	m#385	#725		m#325	#476		#165	150		#228	285	19
Internal Link Dist (ft)		187			251			812			465	
Turn Bay Length (ft)				200			170			210		
Base Capacity (vph)	250	1851		191	2122		257	1022		286	558	638
Starvation Cap Reductn	0	19		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.04	1.11		1.10	1.00		0.89	0.37		1.06	0.65	0.37

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 66.2		Intersection LOS: E	
Intersection Capacity Utilization 91.8%		ICU Level of Service F	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.

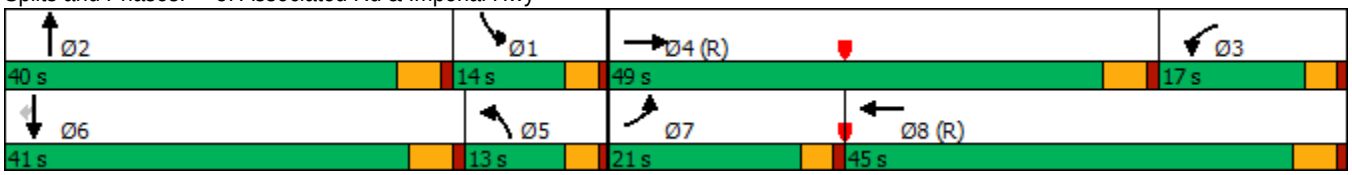
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

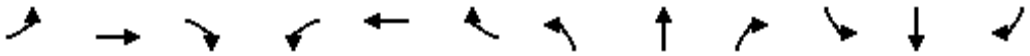
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Associated Rd & Imperial Hwy



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1910	295	237	2116	59	274	48	277	26	24	14
Future Volume (vph)	20	1910	295	237	2116	59	274	48	277	26	24	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140		200	225		0	195		0	85		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.996				0.850		0.945	
Flt Protected	0.950			0.950			0.950	0.966		0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5065	0	1681	1709	1583	1770	1760	0
Flt Permitted	0.950			0.950			0.950	0.966		0.950		
Satd. Flow (perm)	1770	5085	1583	1770	5065	0	1681	1709	1583	1770	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			198		5				277		14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1111			1324			560			455	
Travel Time (s)		25.3			30.1			12.7			10.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	1910	295	237	2116	59	274	48	277	26	24	14
Shared Lane Traffic (%)							42%					
Lane Group Flow (vph)	20	1910	295	237	2175	0	159	163	277	26	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	33.0	33.0	10.0	26.0		27.0	27.0	27.0	11.0	11.0	
Total Split (s)	10.0	56.0	56.0	26.0	72.0		27.0	27.0	27.0	11.0	11.0	
Total Split (%)	8.3%	46.7%	46.7%	21.7%	60.0%		22.5%	22.5%	22.5%	9.2%	9.2%	
Maximum Green (s)	6.0	51.0	51.0	22.0	67.0		22.0	22.0	22.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0			
Flash Dont Walk (s)		21.0	21.0		14.0		15.0	15.0	15.0			
Pedestrian Calls (#/hr)		5	5		5		5	5	5			
Act Effct Green (s)	6.0	53.3	53.3	19.7	73.0		22.0	22.0	22.0	6.0	6.0	
Actuated g/C Ratio	0.05	0.44	0.44	0.16	0.61		0.18	0.18	0.18	0.05	0.05	
v/c Ratio	0.23	0.85	0.36	0.82	0.71		0.52	0.52	0.54	0.30	0.38	
Control Delay	25.6	4.2	0.3	70.2	18.4		51.0	51.0	9.1	63.9	50.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	25.6	4.2	0.3	70.2	18.4		51.0	51.0	9.1	63.9	50.1	
LOS	C	A	A	E	B		D	D	A	E	D	
Approach Delay		3.9			23.5			31.6			55.7	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	13	82	0	176	357		117	121	0	20	18	
Queue Length 95th (ft)	m13	m78	m0	#283	517		193	196	75	51	56	
Internal Link Dist (ft)		1031			1244			480			375	
Turn Bay Length (ft)	140		200	225			195			85		
Base Capacity (vph)	88	2258	813	324	3083		308	313	516	88	101	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.23	0.85	0.36	0.73	0.71		0.52	0.52	0.54	0.30	0.38	

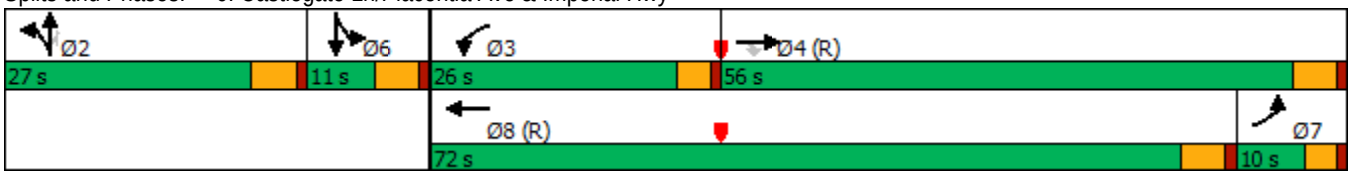
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 4 (3%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 77.2%		ICU Level of Service D	
Analysis Period (min) 15			

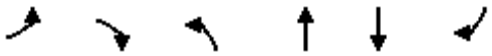
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

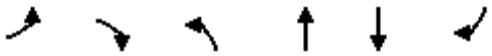
Splits and Phases: 6: Castlegate Ln/Placentia Ave & Imperial Hwy





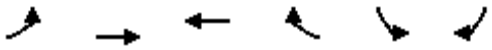
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	40	0	737	767	9
Future Volume (vph)	0	40	0	737	767	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.865			0.998	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3532	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3532	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	540			324	383	
Travel Time (s)	12.3			7.4	8.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	40	0	737	767	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	40	0	737	776	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.5%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	41	124	15	694	775	33
Future Volume (vph)	41	124	15	694	775	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	90			0
Storage Lanes	1	1	1			0
Taper Length (ft)	60		60			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.994	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3518	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3518	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	192			545	324	
Travel Time (s)	4.4			12.4	7.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	41	124	15	694	775	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	124	15	694	808	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.8%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2286	2377	35	0	48
Future Volume (vph)	0	2286	2377	35	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6395	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6395	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		285	267		252	
Travel Time (s)		6.5	6.1		5.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2286	2377	35	0	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2286	2412	0	0	48
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

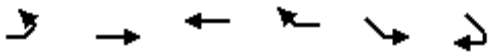
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.0%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	2005	390	0	2968	932	0	0	0	0	0	0
Future Volume (vph)	0	2005	390	0	2968	932	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976				0.850						
Flt Protected												
Satd. Flow (prot)	0	6254	0	0	5085	1583	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	6254	0	0	5085	1583	0	0	0	0	0	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		563			192			626			545	
Travel Time (s)		12.8			4.4			14.2			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2005	390	0	2968	932	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2395	0	0	2968	932	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 61.0%		ICU Level of Service B	
Analysis Period (min) 15			

Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	1889	1104	0	3166	0	0
Future Volume (vph)	1889	1104	0	3166	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	5085	1583	0	5085	0	0
Flt Permitted						
Satd. Flow (perm)	5085	1583	0	5085	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	355			420	859	
Travel Time (s)	8.1			9.5	19.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1889	1104	0	3166	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1889	1104	0	3166	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	2572	2565	403	0	0
Future Volume (vph)	0	2572	2565	403	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.980			
Flt Protected						
Satd. Flow (prot)	0	5085	4984	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	5085	4984	0	0	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		362	563		627	
Travel Time (s)		8.2	12.8		14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2572	2565	403	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2572	2968	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 83.7%		ICU Level of Service E	
Analysis Period (min) 15			

APPENDIX F-IV

YEAR 2045 GENERAL PLAN BUILDOUT PLUS PROJECT TRAFFIC CONDITIONS

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	12	0	531	652	3
Future Vol, veh/h	0	12	0	531	652	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	0	531	652	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	328	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	668	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	668	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	668	-	-
HCM Lane V/C Ratio	-	0.018	-	-
HCM Control Delay (s)	-	10.5	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

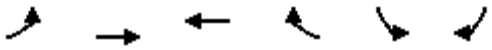
Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	24	12	517	645	19
Future Vol, veh/h	18	24	12	517	645	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	24	12	517	645	19

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	938	332	664	0	-	0
Stage 1	655	-	-	-	-	-
Stage 2	283	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	263	664	921	-	-	-
Stage 1	479	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	260	664	921	-	-	-
Mov Cap-2 Maneuver	260	-	-	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	740	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0.2	0
HCM LOS	B		

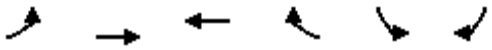
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	921	-	260	664	-	-
HCM Lane V/C Ratio	0.013	-	0.069	0.036	-	-
HCM Control Delay (s)	9	-	19.9	10.6	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.1	-	-



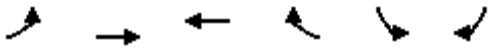
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2486	2091	10	0	9
Future Volume (Veh/h)	0	2486	2091	10	0	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	2486	2091	10	0	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		285	267			
pX, platoon unblocked	0.74				0.85	0.74
vC, conflicting volume	2101				2718	528
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	704				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	655				867	798

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	622	622	622	622	597	597	597	309	9
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	10	9
cSH	1700	1700	1700	1700	1700	1700	1700	1700	798
Volume to Capacity	0.37	0.37	0.37	0.37	0.35	0.35	0.35	0.18	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6
Lane LOS									A
Approach Delay (s)	0.0				0.0				9.6
Approach LOS									A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		



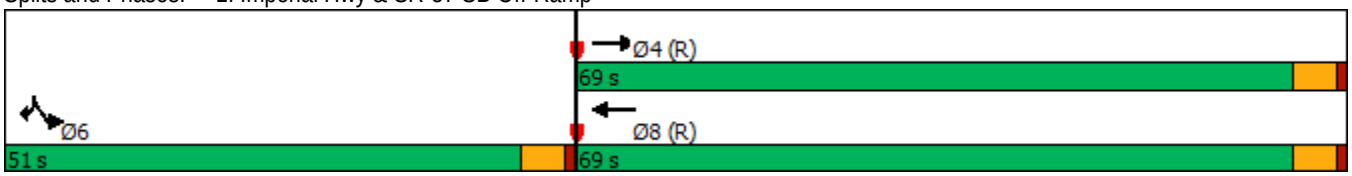
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1712	2048	0	609	562
Future Volume (vph)	0	1712	2048	0	609	562
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	260
Storage Lanes	0			0	2	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.964	0.850
Flt Protected					0.963	
Satd. Flow (prot)	0	5085	5085	0	3355	1441
Flt Permitted					0.963	
Satd. Flow (perm)	0	5085	5085	0	3355	1441
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					5	5
Link Speed (mph)		30	30		30	
Link Distance (ft)		420	362		866	
Travel Time (s)		9.5	8.2		19.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1712	2048	0	609	562
Shared Lane Traffic (%)						34%
Lane Group Flow (vph)	0	1712	2048	0	800	371
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		4	8		6	6
Permitted Phases						

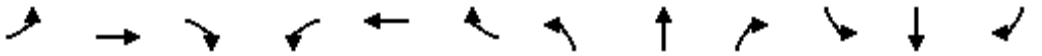


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		6.0	6.0		6.0	6.0
Minimum Split (s)		11.0	27.0		11.0	11.0
Total Split (s)		69.0	69.0		51.0	51.0
Total Split (%)		57.5%	57.5%		42.5%	42.5%
Maximum Green (s)		64.0	64.0		46.0	46.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		Max	Max
Walk Time (s)			7.0			
Flash Dont Walk (s)			15.0			
Pedestrian Calls (#/hr)			5			
Act Effct Green (s)		64.0	64.0		46.0	46.0
Actuated g/C Ratio		0.53	0.53		0.38	0.38
v/c Ratio		0.63	0.76		0.62	0.67
Control Delay		21.0	16.1		32.3	37.4
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		21.0	16.1		32.3	37.4
LOS		C	B		C	D
Approach Delay		21.0	16.1		33.9	
Approach LOS		C	B		C	
Queue Length 50th (ft)		328	416		254	256
Queue Length 95th (ft)		378	485		321	382
Internal Link Dist (ft)		340	282		786	
Turn Bay Length (ft)						260
Base Capacity (vph)		2712	2712		1289	555
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.63	0.76		0.62	0.67

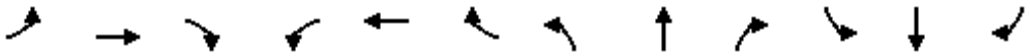
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 46 (38%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 22.1		Intersection LOS: C	
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Imperial Hwy & SR-57 SB Off-Ramp





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	1560	0	0	1623	13	1089	30	831	0	0	84
Future Volume (vph)	95	1560	0	0	1623	13	1089	30	831	0	0	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		350	0		0
Storage Lanes	1		0	0		0	2		1	0		2
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86	0.86	0.91	0.86	0.95	1.00	1.00	0.88
Frt					0.999			0.892	0.850			0.850
Flt Protected	0.950						0.950	0.989				
Satd. Flow (prot)	1770	5085	0	0	6401	0	3221	1413	1504	0	0	2787
Flt Permitted	0.950						0.950	0.989				
Satd. Flow (perm)	1770	5085	0	0	6401	0	3221	1413	1504	0	0	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			9	55			64
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		192			285			643			368	
Travel Time (s)		4.4			6.5			14.6			8.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	1560	0	0	1623	13	1089	30	831	0	0	84
Shared Lane Traffic (%)							10%		43%			
Lane Group Flow (vph)	95	1560	0	0	1636	0	980	496	474	0	0	84
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			1
Detector Template	Left	Thru			Thru		Left	Thru	Right			Right
Leading Detector (ft)	20	100			100		20	100	20			20
Trailing Detector (ft)	0	0			0		0	0	0			0
Detector 1 Position(ft)	0	0			0		0	0	0			0
Detector 1 Size(ft)	20	6			6		20	6	20			20
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Prot	NA			NA		Split	NA	Prot			Over
Protected Phases	7	4			8		2	2	2			7
Permitted Phases												

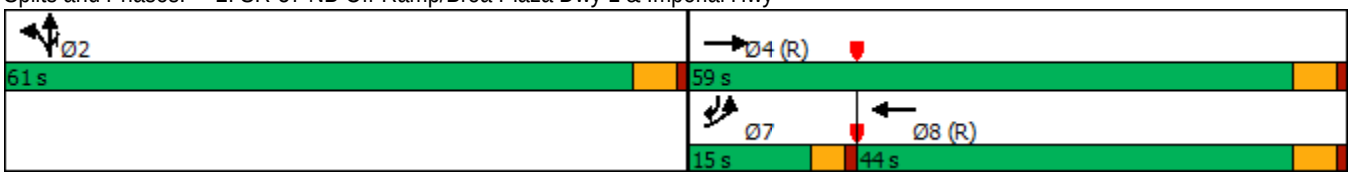


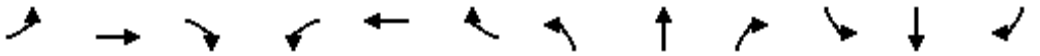
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4			8		2	2	2			7
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0		6.0	6.0	6.0			6.0
Minimum Split (s)	10.0	34.0			31.0		11.0	11.0	11.0			10.0
Total Split (s)	15.0	59.0			44.0		61.0	61.0	61.0			15.0
Total Split (%)	12.5%	49.2%			36.7%		50.8%	50.8%	50.8%			12.5%
Maximum Green (s)	11.0	54.0			39.0		56.0	56.0	56.0			11.0
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0			3.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0	1.0			1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Total Lost Time (s)	4.0	5.0			5.0		5.0	5.0	5.0			4.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Recall Mode	None	C-Max			C-Max		Max	Max	Max			None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		22.0			19.0							
Pedestrian Calls (#/hr)		5			5							
Act Effct Green (s)	10.0	54.0			40.0		56.0	56.0	56.0			10.0
Actuated g/C Ratio	0.08	0.45			0.33		0.47	0.47	0.47			0.08
v/c Ratio	0.64	0.68			0.77		0.65	0.75	0.65			0.29
Control Delay	60.1	27.4			14.5		27.1	34.2	26.4			20.6
Queue Delay	0.0	0.2			0.0		0.0	0.0	0.0			0.0
Total Delay	60.1	27.6			14.5		27.1	34.2	26.4			20.6
LOS	E	C			B		C	C	C			C
Approach Delay		29.4			14.5			28.7			20.6	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	74	365			76		311	351	255			7
Queue Length 95th (ft)	m120	438			122		388	519	384			35
Internal Link Dist (ft)		112			205			563			288	
Turn Bay Length (ft)									350			
Base Capacity (vph)	162	2288			2132		1503	664	731			313
Starvation Cap Reductn	0	0			0		0	0	0			0
Spillback Cap Reductn	0	149			0		0	0	1			0
Storage Cap Reductn	0	0			0		0	0	0			0
Reduced v/c Ratio	0.59	0.73			0.77		0.65	0.75	0.65			0.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 4 (3%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 24.5		Intersection LOS: C	
Intersection Capacity Utilization 72.8%		ICU Level of Service C	
Analysis Period (min) 15			

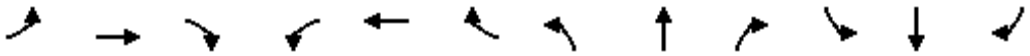
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR-57 NB Off-Ramp/Brea Plaza Dwy 1 & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	950	321	370	814	11	251	6	327	58	30	8
Future Volume (vph)	2	950	321	370	814	11	251	6	327	58	30	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	220		0	225		230	100		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.998				0.850		0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3405	0	3433	3532	0	3433	1863	1583	1770	1803	0
Flt Permitted	0.950			0.950			0.950			0.754		
Satd. Flow (perm)	1770	3405	0	3433	3532	0	3433	1863	1583	1405	1803	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			1				55		8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		664			723			1874			318	
Travel Time (s)		15.1			16.4			42.6			7.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	950	321	370	814	11	251	6	327	58	30	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	1271	0	370	825	0	251	6	327	58	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8		5	2	3		6	
Permitted Phases									2	6		



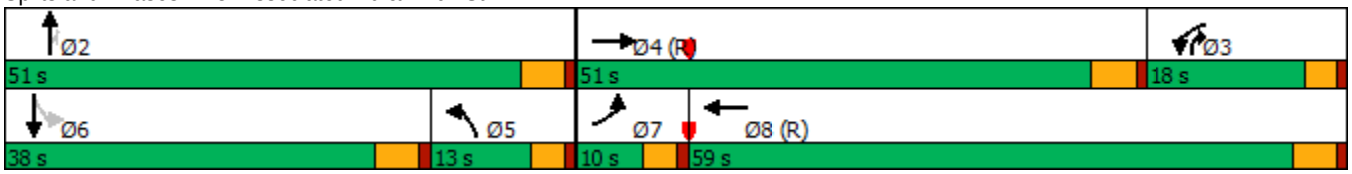
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	3	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	39.0		10.0	38.0		10.0	38.0	10.0	38.0	38.0	
Total Split (s)	10.0	51.0		18.0	59.0		13.0	51.0	18.0	38.0	38.0	
Total Split (%)	8.3%	42.5%		15.0%	49.2%		10.8%	42.5%	15.0%	31.7%	31.7%	
Maximum Green (s)	6.0	46.0		14.0	54.0		9.0	46.0	14.0	33.0	33.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0	4.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	None	Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		27.0			26.0			26.0		26.0	26.0	
Pedestrian Calls (#/hr)		5			5			5		5	5	
Act Effct Green (s)	6.0	46.0		14.0	62.0		9.0	46.0	65.0	33.0	33.0	
Actuated g/C Ratio	0.05	0.38		0.12	0.52		0.08	0.38	0.54	0.28	0.28	
v/c Ratio	0.02	0.95		0.93	0.45		0.98	0.01	0.37	0.15	0.08	
Control Delay	55.0	50.9		82.3	19.8		97.7	19.2	10.0	34.3	27.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	55.0	50.9		82.3	19.8		97.7	19.2	10.0	34.3	27.4	
LOS	D	D		F	B		F	B	A	C	C	
Approach Delay		50.9			39.2			47.8			31.6	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	2	485		148	196		91	2	54	34	17	
Queue Length 95th (ft)	11	#639		#239	295		#184	11	157	70	45	
Internal Link Dist (ft)		584			643			1794			238	
Turn Bay Length (ft)	150			220			225		230	100		
Base Capacity (vph)	88	1333		400	1825		257	714	882	386	501	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.02	0.95		0.93	0.45		0.98	0.01	0.37	0.15	0.08	

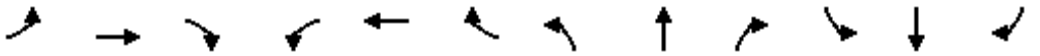
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 74 (62%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 45.3		Intersection LOS: D	
Intersection Capacity Utilization 73.4%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.

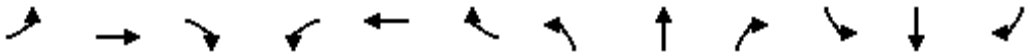
Queue shown is maximum after two cycles.

Splits and Phases: 3: Associated Rd & Birch St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1	48	44	8	42	127	420	16	20	491	29
Future Volume (vph)	20	1	48	44	8	42	127	420	16	20	491	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	110		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.906			0.940			0.994			0.992	
Flt Protected		0.986			0.977		0.950			0.950		
Satd. Flow (prot)	0	1664	0	0	1711	0	1770	3518	0	1770	3511	0
Flt Permitted		0.896			0.818		0.460			0.499		
Satd. Flow (perm)	0	1512	0	0	1432	0	857	3518	0	930	3511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48			37			5			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		496			521			383			1874	
Travel Time (s)		11.3			11.8			8.7			42.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	1	48	44	8	42	127	420	16	20	491	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	0	0	94	0	127	436	0	20	520	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

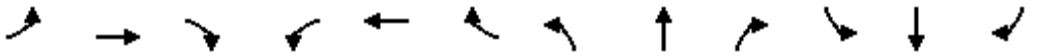


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		25.0	25.0		25.0	25.0	
Total Split (s)	47.0	47.0		47.0	47.0		73.0	73.0		73.0	73.0	
Total Split (%)	39.2%	39.2%		39.2%	39.2%		60.8%	60.8%		60.8%	60.8%	
Maximum Green (s)	42.0	42.0		42.0	42.0		68.0	68.0		68.0	68.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0		25.0	25.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		13.7			13.7		96.3	96.3		96.3	96.3	
Actuated g/C Ratio		0.11			0.11		0.80	0.80		0.80	0.80	
v/c Ratio		0.32			0.48		0.18	0.15		0.03	0.18	
Control Delay		21.3			36.6		2.4	1.6		0.9	0.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		21.3			36.6		2.4	1.6		0.9	0.7	
LOS		C			D		A	A		A	A	
Approach Delay		21.3			36.6			1.8			0.7	
Approach LOS		C			D			A			A	
Queue Length 50th (ft)		15			43		6	11		0	0	
Queue Length 95th (ft)		49			79		m16	m25		m2	m35	
Internal Link Dist (ft)		416			441			303			1794	
Turn Bay Length (ft)							100			110		
Base Capacity (vph)		560			525		688	2825		746	2820	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.12			0.18		0.18	0.15		0.03	0.18	

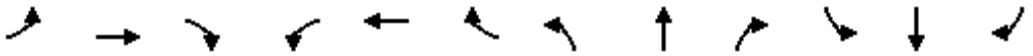
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 15 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 4.9		Intersection LOS: A	
Intersection Capacity Utilization 43.0%		ICU Level of Service A	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Associated Rd & Greenbriar Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	2166	106	96	1789	98	150	218	93	162	347	161
Future Volume (vph)	214	2166	106	96	1789	98	150	218	93	162	347	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	170		0	210		0
Storage Lanes	1		0	1		0	2		0	2		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	0.97	0.95	0.95	0.97	1.00	1.00
Frt		0.993			0.992			0.955				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5050	0	1770	6357	0	3433	3380	0	3433	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	5050	0	1770	6357	0	3433	3380	0	3433	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			10			55				161
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			331			892			545	
Travel Time (s)		6.1			7.5			20.3			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	214	2166	106	96	1789	98	150	218	93	162	347	161
Shared Lane Traffic (%)												
Lane Group Flow (vph)	214	2272	0	96	1887	0	150	311	0	162	347	161
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	10.0	38.0		10.0	37.0		10.0	40.0		10.0	41.0	41.0
Total Split (s)	22.0	58.0		11.0	47.0		10.0	40.0		11.0	41.0	41.0
Total Split (%)	18.3%	48.3%		9.2%	39.2%		8.3%	33.3%		9.2%	34.2%	34.2%
Maximum Green (s)	18.0	53.0		7.0	42.0		6.0	35.0		7.0	36.0	36.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		26.0			25.0			28.0			29.0	29.0
Pedestrian Calls (#/hr)		5			5			5			5	5
Act Effct Green (s)	17.1	53.0		7.0	42.9		6.0	35.0		7.0	36.0	36.0
Actuated g/C Ratio	0.14	0.44		0.06	0.36		0.05	0.29		0.06	0.30	0.30
v/c Ratio	0.85	1.02		0.93	0.83		0.88	0.30		0.81	0.62	0.27
Control Delay	83.0	46.1		114.9	29.3		99.4	27.9		69.1	23.6	2.1
Queue Delay	0.0	5.5		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	83.0	51.6		114.9	29.3		99.4	27.9		69.1	23.6	2.1
LOS	F	D		F	C		F	C		E	C	A
Approach Delay		54.3			33.4			51.1			29.5	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	173	~393		76	222		60	80		67	145	2
Queue Length 95th (ft)	m#287	#757		#180	236		#123	120		#125	222	30
Internal Link Dist (ft)		187			251			812			465	
Turn Bay Length (ft)				200			170			210		
Base Capacity (vph)	265	2234		103	2278		171	1024		200	558	587
Starvation Cap Reductn	0	35		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.81	1.03		0.93	0.83		0.88	0.30		0.81	0.62	0.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 116 (97%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 43.7		Intersection LOS: D	
Intersection Capacity Utilization 87.8%		ICU Level of Service E	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.

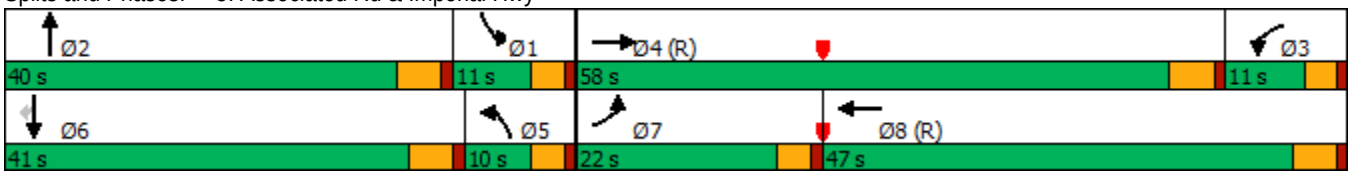
Queue shown is maximum after two cycles.

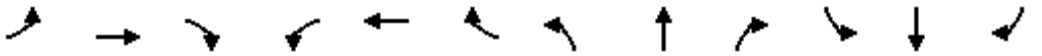
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

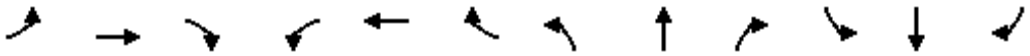
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Associated Rd & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	2009	479	201	1649	34	191	12	149	26	29	14
Future Volume (vph)	14	2009	479	201	1649	34	191	12	149	26	29	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140		200	225		0	195		0	85		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.997				0.850		0.951	
Flt Protected	0.950			0.950			0.950	0.958		0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5070	0	1681	1695	1583	1770	1771	0
Flt Permitted	0.950			0.950			0.950	0.958		0.950		
Satd. Flow (perm)	1770	5085	1583	1770	5070	0	1681	1695	1583	1770	1771	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			319		4				149		14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1111			1324			560			455	
Travel Time (s)		25.3			30.1			12.7			10.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	2009	479	201	1649	34	191	12	149	26	29	14
Shared Lane Traffic (%)							47%					
Lane Group Flow (vph)	14	2009	479	201	1683	0	101	102	149	26	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	33.0	33.0	10.0	26.0		27.0	27.0	27.0	11.0	11.0	
Total Split (s)	10.0	59.0	59.0	23.0	72.0		27.0	27.0	27.0	11.0	11.0	
Total Split (%)	8.3%	49.2%	49.2%	19.2%	60.0%		22.5%	22.5%	22.5%	9.2%	9.2%	
Maximum Green (s)	6.0	54.0	54.0	19.0	67.0		22.0	22.0	22.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0			
Flash Dont Walk (s)		21.0	21.0		14.0		15.0	15.0	15.0			
Pedestrian Calls (#/hr)		5	5		5		5	5	5			
Act Effct Green (s)	6.0	55.8	55.8	17.2	73.0		22.0	22.0	22.0	6.0	6.0	
Actuated g/C Ratio	0.05	0.46	0.46	0.14	0.61		0.18	0.18	0.18	0.05	0.05	
v/c Ratio	0.16	0.85	0.53	0.79	0.55		0.33	0.33	0.36	0.30	0.43	
Control Delay	33.9	10.8	1.4	71.9	15.2		46.0	46.0	9.3	63.9	54.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	33.9	10.8	1.4	71.9	15.2		46.0	46.0	9.3	63.9	54.1	
LOS	C	B	A	E	B		D	D	A	E	D	
Approach Delay		9.1			21.2			30.5			57.8	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	9	131	0	150	236		72	72	0	20	22	
Queue Length 95th (ft)	m11	m131	m0	#251	347		129	130	57	51	61	
Internal Link Dist (ft)		1031			1244			480			375	
Turn Bay Length (ft)	140		200	225			195			85		
Base Capacity (vph)	88	2365	906	280	3085		308	310	411	88	101	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.16	0.85	0.53	0.72	0.55		0.33	0.33	0.36	0.30	0.43	

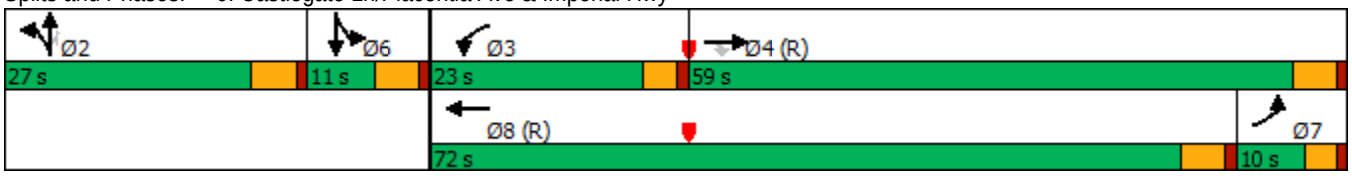
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 73.9%		ICU Level of Service D	
Analysis Period (min) 15			

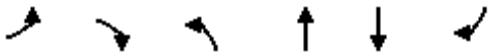
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

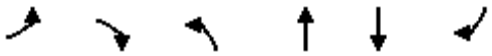
Splits and Phases: 6: Castlegate Ln/Placentia Ave & Imperial Hwy





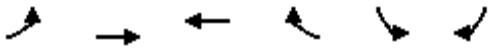
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	12	0	531	652	3
Future Volume (vph)	0	12	0	531	652	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.865			0.999	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3536	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3536	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	540			324	383	
Travel Time (s)	12.3			7.4	8.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	12	0	531	652	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	12	0	531	655	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.1%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	18	24	12	517	645	19
Future Volume (vph)	18	24	12	517	645	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	90			0
Storage Lanes	1	1	1			0
Taper Length (ft)	60		60			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.996	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3525	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3525	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	192			545	324	
Travel Time (s)	4.4			12.4	7.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	18	24	12	517	645	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	24	12	517	664	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.4%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2486	2091	10	0	9
Future Volume (vph)	0	2486	2091	10	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6401	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6401	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		285	267		252	
Travel Time (s)		6.5	6.1		5.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2486	2091	10	0	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2486	2101	0	0	9
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

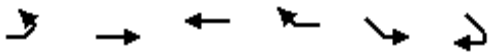
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.5%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	1655	575	0	2246	550	0	0	0	0	0	0
Future Volume (vph)	0	1655	575	0	2246	550	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961				0.850						
Flt Protected												
Satd. Flow (prot)	0	6158	0	0	5085	1583	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	6158	0	0	5085	1583	0	0	0	0	0	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		563			192			626			545	
Travel Time (s)		12.8			4.4			14.2			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1655	575	0	2246	550	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2230	0	0	2246	550	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.7%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	1712	836	0	2610	0	0
Future Volume (vph)	1712	836	0	2610	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	5085	1583	0	5085	0	0
Flt Permitted						
Satd. Flow (perm)	5085	1583	0	5085	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	355			420	859	
Travel Time (s)	8.1			9.5	19.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1712	836	0	2610	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1712	836	0	2610	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 55.1%		ICU Level of Service B	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	2321	2048	198	0	0
Future Volume (vph)	0	2321	2048	198	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.987			
Flt Protected						
Satd. Flow (prot)	0	5085	5019	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	5085	5019	0	0	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		362	563		627	
Travel Time (s)		8.2	12.8		14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2321	2048	198	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2321	2246	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	0	745	827	5
Future Vol, veh/h	0	4	0	745	827	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	0	745	827	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	416	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	585	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	585	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	585	-	-
HCM Lane V/C Ratio	-	0.007	-	-
HCM Control Delay (s)	-	11.2	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

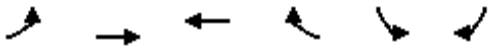
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	117	18	707	798	34
Future Vol, veh/h	36	117	18	707	798	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	117	18	707	798	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1205	416	832	0	-	0
Stage 1	815	-	-	-	-	-
Stage 2	390	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	176	585	796	-	-	-
Stage 1	396	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	172	585	796	-	-	-
Mov Cap-2 Maneuver	172	-	-	-	-	-
Stage 1	387	-	-	-	-	-
Stage 2	653	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.1	0.2	0
HCM LOS	C		

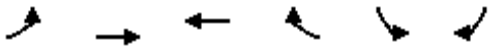
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	796	-	172	585	-	-
HCM Lane V/C Ratio	0.023	-	0.209	0.2	-	-
HCM Control Delay (s)	9.6	-	31.4	12.7	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	0.7	-	-



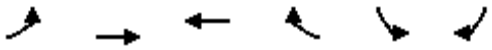
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2300	2400	30	0	43
Future Volume (Veh/h)	0	2300	2400	30	0	43
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	2300	2400	30	0	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		285	267			
pX, platoon unblocked	0.68				0.78	0.68
vC, conflicting volume	2430				2990	615
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	750				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	581				800	737

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	575	575	575	575	686	686	686	373	43
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	30	43
cSH	1700	1700	1700	1700	1700	1700	1700	1700	737
Volume to Capacity	0.34	0.34	0.34	0.34	0.40	0.40	0.40	0.22	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2
Lane LOS									B
Approach Delay (s)	0.0				0.0				10.2
Approach LOS									B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1870	2547	0	681	601
Future Volume (vph)	0	1870	2547	0	681	601
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	260
Storage Lanes	0			0	2	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.966	0.850
Flt Protected					0.963	
Satd. Flow (prot)	0	5085	5085	0	3362	1441
Flt Permitted					0.963	
Satd. Flow (perm)	0	5085	5085	0	3362	1441
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					2	2
Link Speed (mph)		30	30		30	
Link Distance (ft)		420	362		866	
Travel Time (s)		9.5	8.2		19.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1870	2547	0	681	601
Shared Lane Traffic (%)						33%
Lane Group Flow (vph)	0	1870	2547	0	879	403
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		4	8		6	6
Permitted Phases						



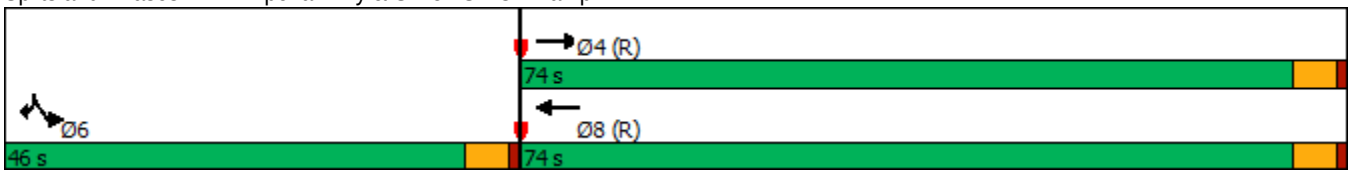
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		6.0	6.0		6.0	6.0
Minimum Split (s)		11.0	27.0		11.0	11.0
Total Split (s)		74.0	74.0		46.0	46.0
Total Split (%)		61.7%	61.7%		38.3%	38.3%
Maximum Green (s)		69.0	69.0		41.0	41.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		Max	Max
Walk Time (s)			7.0			
Flash Dont Walk (s)			15.0			
Pedestrian Calls (#/hr)			5			
Act Effct Green (s)		69.0	69.0		41.0	41.0
Actuated g/C Ratio		0.58	0.58		0.34	0.34
v/c Ratio		0.64	0.87		0.76	0.82
Control Delay		18.4	15.0		40.4	50.9
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		18.4	15.0		40.4	50.9
LOS		B	B		D	D
Approach Delay		18.4	15.0		43.7	
Approach LOS		B	B		D	
Queue Length 50th (ft)		338	264		310	309
Queue Length 95th (ft)		388	283		387	#494
Internal Link Dist (ft)		340	282		786	
Turn Bay Length (ft)						260
Base Capacity (vph)		2923	2923		1150	493
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.64	0.87		0.76	0.82

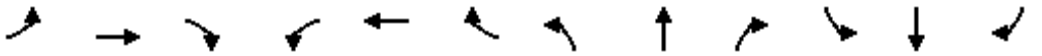
Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 8 (7%), Referenced to phase 4:EBT and 8:WBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.

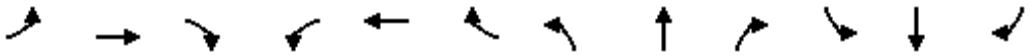
Queue shown is maximum after two cycles.

Splits and Phases: 1: Imperial Hwy & SR-57 SB Off-Ramp





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	1808	0	0	2549	37	1144	62	434	0	0	184
Future Volume (vph)	175	1808	0	0	2549	37	1144	62	434	0	0	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		350	0		0
Storage Lanes	1		0	0		0	2		1	0		2
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86	0.86	0.91	0.86	0.95	1.00	1.00	0.88
Frt					0.998			0.980	0.850			0.850
Flt Protected	0.950						0.950	0.965				
Satd. Flow (prot)	1770	5085	0	0	6395	0	3221	1515	1504	0	0	2787
Flt Permitted	0.950						0.950	0.965				
Satd. Flow (perm)	1770	5085	0	0	6395	0	3221	1515	1504	0	0	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			7	55			64
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		192			285			643			368	
Travel Time (s)		4.4			6.5			14.6			8.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	175	1808	0	0	2549	37	1144	62	434	0	0	184
Shared Lane Traffic (%)							26%		13%			
Lane Group Flow (vph)	175	1808	0	0	2586	0	847	415	378	0	0	184
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			1
Detector Template	Left	Thru			Thru		Left	Thru	Right			Right
Leading Detector (ft)	20	100			100		20	100	20			20
Trailing Detector (ft)	0	0			0		0	0	0			0
Detector 1 Position(ft)	0	0			0		0	0	0			0
Detector 1 Size(ft)	20	6			6		20	6	20			20
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Prot	NA			NA		Split	NA	Prot			Over
Protected Phases	7	4			8		2	2	2			7
Permitted Phases												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4			8		2	2	2			7
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0		6.0	6.0	6.0			6.0
Minimum Split (s)	10.0	34.0			31.0		11.0	11.0	11.0			10.0
Total Split (s)	19.0	76.0			57.0		44.0	44.0	44.0			19.0
Total Split (%)	15.8%	63.3%			47.5%		36.7%	36.7%	36.7%			15.8%
Maximum Green (s)	15.0	71.0			52.0		39.0	39.0	39.0			15.0
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0			3.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0	1.0			1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0			0.0
Total Lost Time (s)	4.0	5.0			5.0		5.0	5.0	5.0			4.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Recall Mode	None	C-Max			C-Max		Max	Max	Max			None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		22.0			19.0							
Pedestrian Calls (#/hr)		5			5							
Act Effct Green (s)	14.4	71.0			52.6		39.0	39.0	39.0			14.4
Actuated g/C Ratio	0.12	0.59			0.44		0.32	0.32	0.32			0.12
v/c Ratio	0.83	0.60			0.92		0.81	0.84	0.72			0.47
Control Delay	77.4	17.8			11.7		44.4	53.0	39.3			35.9
Queue Delay	0.0	0.1			0.3		0.0	0.0	0.0			0.0
Total Delay	77.4	18.0			12.0		44.4	53.0	39.3			35.9
LOS	E	B			B		D	D	D			D
Approach Delay		23.2			12.0			45.4			35.9	
Approach LOS		C			B			D			D	
Queue Length 50th (ft)	135	276			136		329	339	233			48
Queue Length 95th (ft)	m#235	338			m138		413	#540	358			89
Internal Link Dist (ft)		112			205			563			288	
Turn Bay Length (ft)									350			
Base Capacity (vph)	221	3008			2806		1046	497	525			404
Starvation Cap Reductn	0	0			30		0	0	0			0
Spillback Cap Reductn	0	315			0		0	0	2			0
Storage Cap Reductn	0	0			0		0	0	0			0
Reduced v/c Ratio	0.79	0.67			0.93		0.81	0.84	0.72			0.46

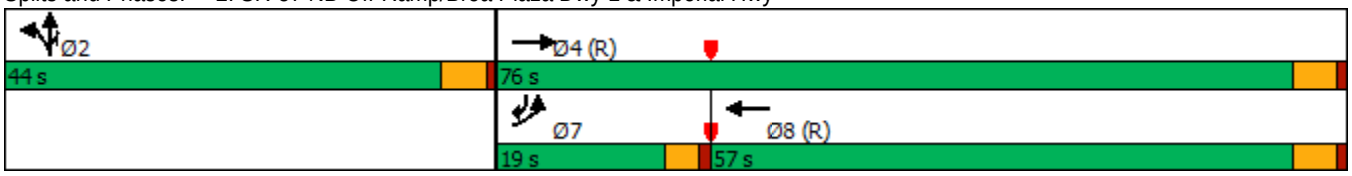
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 24.7		Intersection LOS: C	
Intersection Capacity Utilization 84.1%		ICU Level of Service E	
Analysis Period (min) 15			

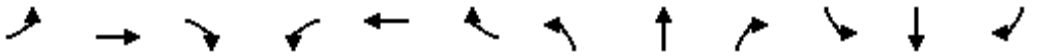
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

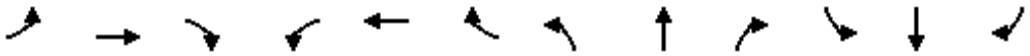
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR-57 NB Off-Ramp/Brea Plaza Dwy 1 & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	889	300	300	1248	17	483	34	367	11	21	6
Future Volume (vph)	12	889	300	300	1248	17	483	34	367	11	21	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	220		0	225		230	100		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.998				0.850		0.967	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3405	0	3433	3532	0	3433	1863	1583	1770	1801	0
Flt Permitted	0.950			0.950			0.950			0.735		
Satd. Flow (perm)	1770	3405	0	3433	3532	0	3433	1863	1583	1369	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			1				55		6	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		664			723			1874			318	
Travel Time (s)		15.1			16.4			42.6			7.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	12	889	300	300	1248	17	483	34	367	11	21	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1189	0	300	1265	0	483	34	367	11	27	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8		5	2	3		6	
Permitted Phases									2	6		



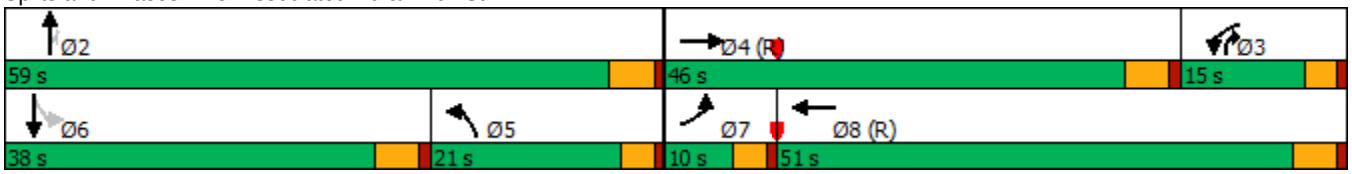
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	3	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	39.0		10.0	38.0		10.0	38.0	10.0	38.0	38.0	
Total Split (s)	10.0	46.0		15.0	51.0		21.0	59.0	15.0	38.0	38.0	
Total Split (%)	8.3%	38.3%		12.5%	42.5%		17.5%	49.2%	12.5%	31.7%	31.7%	
Maximum Green (s)	6.0	41.0		11.0	46.0		17.0	54.0	11.0	33.0	33.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0	4.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	None	Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		27.0			26.0			26.0		26.0	26.0	
Pedestrian Calls (#/hr)		5			5			5		5	5	
Act Effct Green (s)	6.0	41.0		11.0	52.0		17.0	54.0	70.0	33.0	33.0	
Actuated g/C Ratio	0.05	0.34		0.09	0.43		0.14	0.45	0.58	0.28	0.28	
v/c Ratio	0.14	1.00		0.96	0.83		0.99	0.04	0.39	0.03	0.05	
Control Delay	58.2	64.0		95.1	36.5		86.3	16.3	10.6	32.3	27.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	58.2	64.0		95.1	36.5		86.3	16.3	10.6	32.3	27.1	
LOS	E	E		F	D		F	B	B	C	C	
Approach Delay		64.0			47.8			52.2			28.6	
Approach LOS		E			D			D			C	
Queue Length 50th (ft)	9	468		121	417		196	14	113	6	12	
Queue Length 95th (ft)	30	#630		#209	#636		#314	29	145	21	36	
Internal Link Dist (ft)		584			643			1794			238	
Turn Bay Length (ft)	150			220			225		230	100		
Base Capacity (vph)	88	1191		314	1530		486	838	946	376	499	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.14	1.00		0.96	0.83		0.99	0.04	0.39	0.03	0.05	

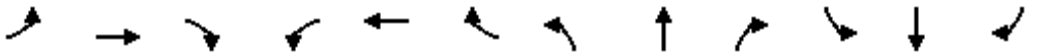
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 86 (72%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 53.9		Intersection LOS: D	
Intersection Capacity Utilization 74.8%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.

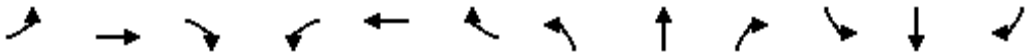
Queue shown is maximum after two cycles.

Splits and Phases: 3: Associated Rd & Birch St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	9	99	28	4	37	56	556	39	17	577	19
Future Volume (vph)	41	9	99	28	4	37	56	556	39	17	577	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	110		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.910			0.928			0.990			0.995	
Flt Protected		0.986			0.980		0.950			0.950		
Satd. Flow (prot)	0	1671	0	0	1694	0	1770	3504	0	1770	3522	0
Flt Permitted		0.887			0.666		0.427			0.427		
Satd. Flow (perm)	0	1504	0	0	1151	0	795	3504	0	795	3522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		99			37			9			4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		496			521			383			1874	
Travel Time (s)		11.3			11.8			8.7			42.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	41	9	99	28	4	37	56	556	39	17	577	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	149	0	0	69	0	56	595	0	17	596	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

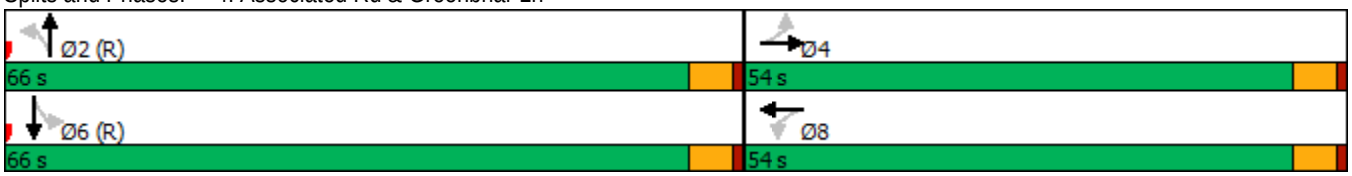


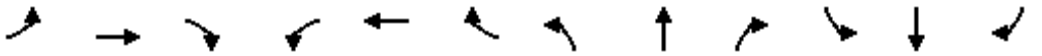
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		25.0	25.0		25.0	25.0	
Total Split (s)	54.0	54.0		54.0	54.0		66.0	66.0		66.0	66.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		55.0%	55.0%		55.0%	55.0%	
Maximum Green (s)	49.0	49.0		49.0	49.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0		25.0	25.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		13.3			13.3		96.7	96.7		96.7	96.7	
Actuated g/C Ratio		0.11			0.11		0.81	0.81		0.81	0.81	
v/c Ratio		0.58			0.43		0.09	0.21		0.03	0.21	
Control Delay		26.5			31.7		4.6	3.5		0.2	0.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		26.5			31.7		4.6	3.5		0.2	0.3	
LOS		C			C		A	A		A	A	
Approach Delay		26.5			31.7			3.6			0.3	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		38			24		5	30		0	1	
Queue Length 95th (ft)		85			58		m14	m61		m0	m2	
Internal Link Dist (ft)		416			441			303			1794	
Turn Bay Length (ft)							100			110		
Base Capacity (vph)		672			491		640	2824		640	2837	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.22			0.14		0.09	0.21		0.03	0.21	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 19 (16%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 5.8		Intersection LOS: A	
Intersection Capacity Utilization 44.3%		ICU Level of Service A	
Analysis Period (min) 15			

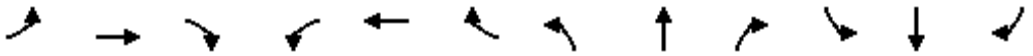
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Associated Rd & Greenbriar Ln





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	272	1882	146	210	1941	181	227	272	103	294	363	260
Future Volume (vph)	272	1882	146	210	1941	181	227	272	103	294	363	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	170		0	210		0
Storage Lanes	1		0	1		0	2		0	2		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	0.97	0.95	0.95	0.97	1.00	1.00
Frt		0.989			0.987			0.959				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5029	0	1770	6325	0	3433	3394	0	3433	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	5029	0	1770	6325	0	3433	3394	0	3433	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			19			46				260
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			331			892			545	
Travel Time (s)		6.1			7.5			20.3			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	272	1882	146	210	1941	181	227	272	103	294	363	260
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	2028	0	210	2122	0	227	375	0	294	363	260
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	10.0	38.0		10.0	37.0		10.0	40.0		10.0	41.0	41.0
Total Split (s)	21.0	49.0		17.0	45.0		13.0	40.0		14.0	41.0	41.0
Total Split (%)	17.5%	40.8%		14.2%	37.5%		10.8%	33.3%		11.7%	34.2%	34.2%
Maximum Green (s)	17.0	44.0		13.0	40.0		9.0	35.0		10.0	36.0	36.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		26.0			25.0			28.0			29.0	29.0
Pedestrian Calls (#/hr)		5			5			5			5	5
Act Effct Green (s)	17.0	44.0		13.0	40.0		9.0	35.0		10.0	36.0	36.0
Actuated g/C Ratio	0.14	0.37		0.11	0.33		0.08	0.29		0.08	0.30	0.30
v/c Ratio	1.09	1.10		1.10	1.00		0.88	0.37		1.03	0.65	0.40
Control Delay	136.3	77.7		129.2	50.5		87.9	30.6		102.0	31.3	3.6
Queue Delay	0.0	1.9		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	136.3	79.6		129.2	50.5		87.9	30.6		102.0	31.3	3.6
LOS	F	E		F	D		F	C		F	C	A
Approach Delay		86.3			57.6			52.2			46.1	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)	~235	~653		~178	~253		91	105		~128	179	4
Queue Length 95th (ft)	m#410	#727		m#325	#472		#164	150		#221	289	20
Internal Link Dist (ft)		187			251			812			465	
Turn Bay Length (ft)				200			170			210		
Base Capacity (vph)	250	1851		191	2121		257	1022		286	558	656
Starvation Cap Reductn	0	19		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.09	1.11		1.10	1.00		0.88	0.37		1.03	0.65	0.40

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 66.1 Intersection LOS: E
Intersection Capacity Utilization 91.8% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

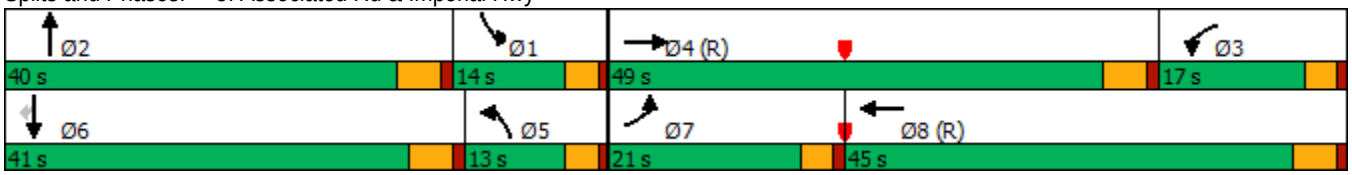
Queue shown is maximum after two cycles.

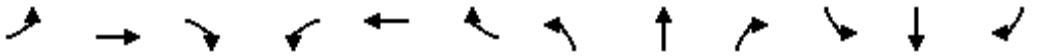
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

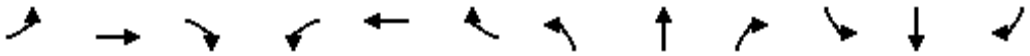
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Associated Rd & Imperial Hwy





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1909	291	237	2114	59	272	48	277	26	24	14
Future Volume (vph)	20	1909	291	237	2114	59	272	48	277	26	24	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140		200	225		0	195		0	85		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.996				0.850		0.945	
Flt Protected	0.950			0.950			0.950	0.966		0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5065	0	1681	1709	1583	1770	1760	0
Flt Permitted	0.950			0.950			0.950	0.966		0.950		
Satd. Flow (perm)	1770	5085	1583	1770	5065	0	1681	1709	1583	1770	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			195		5				277		14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1111			1324			560			455	
Travel Time (s)		25.3			30.1			12.7			10.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	1909	291	237	2114	59	272	48	277	26	24	14
Shared Lane Traffic (%)							42%					
Lane Group Flow (vph)	20	1909	291	237	2173	0	158	162	277	26	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	33.0	33.0	10.0	26.0		27.0	27.0	27.0	11.0	11.0	
Total Split (s)	10.0	56.0	56.0	26.0	72.0		27.0	27.0	27.0	11.0	11.0	
Total Split (%)	8.3%	46.7%	46.7%	21.7%	60.0%		22.5%	22.5%	22.5%	9.2%	9.2%	
Maximum Green (s)	6.0	51.0	51.0	22.0	67.0		22.0	22.0	22.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0			
Flash Dont Walk (s)		21.0	21.0		14.0		15.0	15.0	15.0			
Pedestrian Calls (#/hr)		5	5		5		5	5	5			
Act Effct Green (s)	6.0	53.3	53.3	19.7	73.0		22.0	22.0	22.0	6.0	6.0	
Actuated g/C Ratio	0.05	0.44	0.44	0.16	0.61		0.18	0.18	0.18	0.05	0.05	
v/c Ratio	0.23	0.85	0.36	0.82	0.70		0.51	0.52	0.54	0.30	0.38	
Control Delay	25.5	4.1	0.3	70.2	18.4		50.9	50.9	9.1	63.9	50.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	25.5	4.1	0.3	70.2	18.4		50.9	50.9	9.1	63.9	50.1	
LOS	C	A	A	E	B		D	D	A	E	D	
Approach Delay		3.8			23.5			31.5			55.7	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	13	79	0	176	357		116	120	0	20	18	
Queue Length 95th (ft)	m13	m76	m0	#283	516		191	195	75	51	56	
Internal Link Dist (ft)		1031			1244			480			375	
Turn Bay Length (ft)	140		200	225			195			85		
Base Capacity (vph)	88	2258	811	324	3083		308	313	516	88	101	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.23	0.85	0.36	0.73	0.70		0.51	0.52	0.54	0.30	0.38	

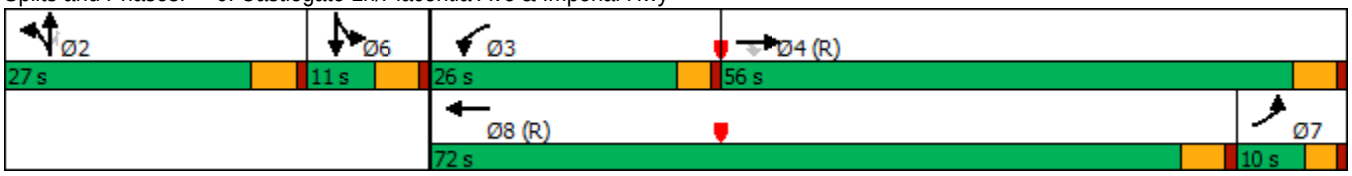
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 4 (3%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 16.5		Intersection LOS: B	
Intersection Capacity Utilization 77.1%		ICU Level of Service D	
Analysis Period (min) 15			

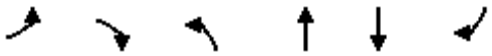
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

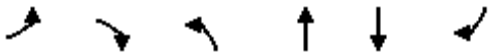
Splits and Phases: 6: Castlegate Ln/Placentia Ave & Imperial Hwy





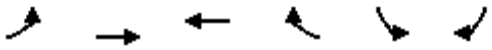
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	4	0	745	827	5
Future Volume (vph)	0	4	0	745	827	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.865			0.999	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3536	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3536	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	540			324	383	
Travel Time (s)	12.3			7.4	8.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	4	0	745	827	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	0	745	832	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.0%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	117	18	707	798	34
Future Volume (vph)	36	117	18	707	798	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	90			0
Storage Lanes	1	1	1			0
Taper Length (ft)	60		60			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.994	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3518	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3518	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	192			545	324	
Travel Time (s)	4.4			12.4	7.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	36	117	18	707	798	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	117	18	707	832	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.1%		ICU Level of Service A	
Analysis Period (min) 15			

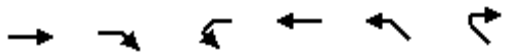


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2300	2400	30	0	43
Future Volume (vph)	0	2300	2400	30	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	60				60	
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6395	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6395	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		285	267		252	
Travel Time (s)		6.5	6.1		5.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2300	2400	30	0	43
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2300	2430	0	0	43
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.3%		ICU Level of Service A	
Analysis Period (min) 15			

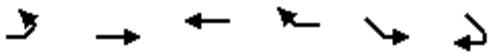
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	1983	390	0	2950	927	0	0	0	0	0	0
Future Volume (vph)	0	1983	390	0	2950	927	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975				0.850						
Flt Protected												
Satd. Flow (prot)	0	6248	0	0	5085	1583	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	6248	0	0	5085	1583	0	0	0	0	0	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		563			192			626			545	
Travel Time (s)		12.8			4.4			14.2			12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1983	390	0	2950	927	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2373	0	0	2950	927	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.7%		ICU Level of Service B	
Analysis Period (min) 15			



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	1870	1104	0	3148	0	0
Future Volume (vph)	1870	1104	0	3148	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	5085	1583	0	5085	0	0
Flt Permitted						
Satd. Flow (perm)	5085	1583	0	5085	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	355			420	859	
Travel Time (s)	8.1			9.5	19.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1870	1104	0	3148	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1870	1104	0	3148	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	2551	2547	403	0	0
Future Volume (vph)	0	2551	2547	403	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.980			
Flt Protected						
Satd. Flow (prot)	0	5085	4984	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	5085	4984	0	0	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		362	563		627	
Travel Time (s)		8.2	12.8		14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2551	2547	403	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2551	2950	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 83.3%		ICU Level of Service E	
Analysis Period (min) 15			

APPENDIX G

INTERSECTION SAFETY ENHANCEMENT WORKSHEETS

APPENDIX G-I

INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS – ICU

YEAR 2045 GENERAL PLAN BUILDOUT PLUS PROJECT TRAFFIC CONDITIONS WITH INTERSECTION SAFETY ENHANCEMENTS

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.556

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	2	82	15	8	2	1	238	80	93	204	3
Total Analysis Volume [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	2	1	6	0
Auxiliary Signal Groups			1,8						2,3			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.08	0.03	0.02	0.02	0.00	0.28	0.12	0.11	0.24	0.24
Intersection LOS	A											
Intersection V/C	0.556											

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.587

Intersection Setup

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Rd			S. Associated Rd			Birch St			Birch St		
Base Volume Input [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	121	9	92	3	5	2	3	222	75	75	312	4
Total Analysis Volume [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal Group	3	8	8	0	4	0	5	2	2	1	6	0
Auxiliary Signal Groups			1,8						2,3			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.02	0.13	0.01	0.02	0.02	0.01	0.26	0.03	0.09	0.37	0.37
Intersection LOS	A											
Intersection V/C	0.587											

APPENDIX G-II

INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS – HCM

YEAR 2045 GENERAL PLAN BUILDOUT PLUS PROJECT TRAFFIC CONDITIONS WITH INTERSECTION SAFETY ENHANCEMENTS

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	23.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.623

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	2	82	15	8	2	1	238	80	93	204	3
Total Analysis Volume [veh/h]	251	6	327	58	30	8	2	950	321	370	814	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	2	1	6	0
Auxiliary Signal Groups									2,3			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	6	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	30	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	13	50	0	0	37	0	10	38	38	17	45	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	27	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No	No	No	No	
Maximum Recall	No	No			No		No	No	No	No	No	
Pedestrian Recall	No	No			No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	21	21	8	8	0	60	73	13	72	72
g / C, Green / Cycle	0.09	0.20	0.20	0.07	0.07	0.00	0.57	0.69	0.12	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.07	0.00	0.17	0.03	0.02	0.00	0.25	0.17	0.11	0.22	0.22
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	3800	1900	3500	1900	1900
c, Capacity [veh/h]	302	373	373	163	136	8	2151	1312	433	1302	1302
d1, Uniform Delay [s]	47.26	34.07	41.02	46.80	46.22	52.16	13.19	6.06	45.14	6.65	6.64
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.84	0.02	6.66	1.32	1.10	16.15	0.66	0.44	4.94	0.64	0.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.02	0.88	0.36	0.28	0.25	0.44	0.24	0.86	0.32	0.32
d, Delay for Lane Group [s/veh]	53.10	34.09	47.68	48.12	47.32	68.31	13.85	6.50	50.09	7.29	7.28
Lane Group LOS	D	C	D	D	D	E	B	A	D	A	A
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.46	0.13	8.82	1.51	0.98	0.09	6.38	2.53	4.99	3.55	3.52
50th-Percentile Queue Length [ft/ln]	86.53	3.14	220.55	37.77	24.51	2.19	159.40	63.27	124.83	88.63	88.12
95th-Percentile Queue Length [veh/ln]	6.23	0.23	13.69	2.72	1.76	0.16	10.52	4.56	8.66	6.38	6.34
95th-Percentile Queue Length [ft/ln]	155.75	5.66	342.33	67.98	44.12	3.94	262.93	113.89	216.45	159.53	158.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.10	34.09	47.68	48.12	47.32	47.32	68.31	13.85	6.50	50.09	7.29	7.28
Movement LOS	D	C	D	D	D	D	E	B	A	D	A	A
d_A, Approach Delay [s/veh]	49.87			47.80			12.09			20.54		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	23.39											
Intersection LOS	C											
Intersection V/C	0.623											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
l_p,int, Pedestrian LOS Score for Intersection	2.672	1.985	2.841	2.954
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	876	629	648	781
d_b, Bicycle Delay [s]	16.58	24.69	24.00	19.50
l_b,int, Bicycle LOS Score for Intersection	2.523	1.718	2.610	2.545
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: S. Associated Road at Birch Street

Control Type:	Signalized	Delay (sec / veh):	25.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.615

Intersection Setup

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S. Associated Road			S. Associated Road			Birch Street			Birch Street		
Base Volume Input [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	121	9	92	3	5	2	3	222	75	75	312	4
Total Analysis Volume [veh/h]	483	34	367	11	21	6	12	889	300	300	1248	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal Group	3	8	0	0	4	0	5	2	2	1	6	0
Auxiliary Signal Groups									2,3			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	6	6	6	6	6	0
Maximum Green [s]	30	30	0	0	30	0	30	30	30	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	28	65	0	0	37	0	10	38	38	17	45	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	27	27	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No			No		No	No	No	No	No	
Maximum Recall	No	No			No		No	No	No	No	No	
Pedestrian Recall	No	No			No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	20	28	28	4	4	2	68	91	12	78	78
g / C, Green / Cycle	0.16	0.23	0.23	0.04	0.04	0.02	0.57	0.76	0.10	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.14	0.02	0.19	0.01	0.01	0.01	0.23	0.16	0.09	0.33	0.33
s, saturation flow rate [veh/h]	3500	1900	1900	1800	1900	1800	3800	1900	3500	1900	1900
c, Capacity [veh/h]	569	441	441	73	69	31	2150	1447	357	1236	1236
d1, Uniform Delay [s]	48.82	36.01	43.84	56.07	56.53	58.39	14.77	4.04	52.95	10.98	10.97
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.63	0.07	4.12	0.93	3.57	8.01	0.59	0.32	5.38	1.52	1.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.85	0.08	0.83	0.15	0.39	0.39	0.41	0.21	0.84	0.51	0.51
d, Delay for Lane Group [s/veh]	52.45	36.09	47.96	57.00	60.10	66.40	15.36	4.37	58.33	12.50	12.48
Lane Group LOS	D	D	D	E	E	E	B	A	E	B	B
Critical Lane Group	No	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.30	0.80	10.84	0.34	0.87	0.43	6.89	1.93	4.71	8.83	8.79
50th-Percentile Queue Length [ft/ln]	182.52	19.89	270.98	8.57	21.74	10.73	172.32	48.21	117.65	220.71	219.70
95th-Percentile Queue Length [veh/ln]	11.73	1.43	16.24	0.62	1.57	0.77	11.20	3.47	8.26	13.70	13.65
95th-Percentile Queue Length [ft/ln]	293.30	35.80	405.96	15.42	39.13	19.31	279.97	86.77	206.59	342.53	341.25

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.45	36.09	47.96	57.00	60.10	60.10	66.40	15.36	4.37	58.33	12.49	12.48
Movement LOS	D	D	D	E	E	E	E	B	A	E	B	B
d_A, Approach Delay [s/veh]	49.96			59.20			13.12			21.28		
Approach LOS	D			E			B			C		
d_I, Intersection Delay [s/veh]	25.89											
Intersection LOS	C											
Intersection V/C	0.615											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	2.711	1.987	2.944	2.942
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1017	550	567	683
d_b, Bicycle Delay [s]	14.50	31.54	30.82	26.00
l_b,int, Bicycle LOS Score for Intersection	3.018	1.622	2.550	2.851
Bicycle LOS	C	A	B	C

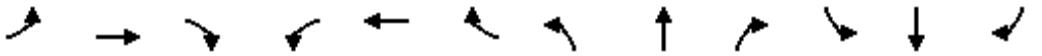
Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX G-III

INTERSECTION QUEUEING WORKSHEETS

YEAR 2045 GENERAL PLAN BUILDOUT PLUS PROJECT TRAFFIC CONDITIONS WITH INTERSECTION SAFETY ENHANCEMENTS



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	950	321	370	814	11	251	6	327	58	30	8
Future Volume (vph)	2	950	321	370	814	11	251	6	327	58	30	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	220		0	225		230	100		0
Storage Lanes	1		1	2		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.998				0.850		0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	3433	3532	0	3433	1863	1583	1770	1803	0
Flt Permitted	0.950			0.950			0.950			0.754		
Satd. Flow (perm)	1770	3539	1583	3433	3532	0	3433	1863	1583	1405	1803	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			321		1				55		8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		664			723			1874			318	
Travel Time (s)		15.1			16.4			42.6			7.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	950	321	370	814	11	251	6	327	58	30	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	950	321	370	825	0	251	6	327	58	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Perm	NA	
Protected Phases	7	4	5	3	8		5	2	3		6	
Permitted Phases			4						2	6		

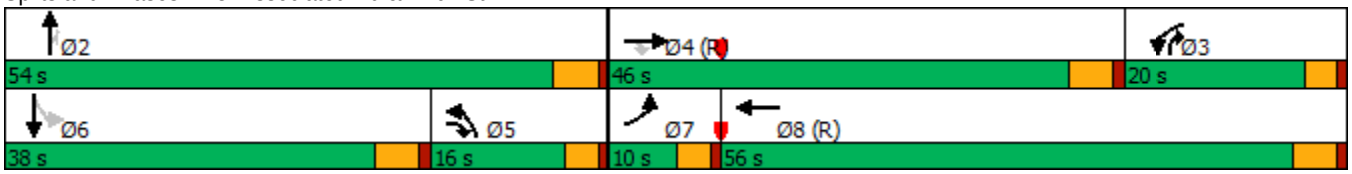
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8		5	2	3	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	39.0	10.0	10.0	38.0		10.0	38.0	10.0	38.0	38.0	
Total Split (s)	10.0	46.0	16.0	20.0	56.0		16.0	54.0	20.0	38.0	38.0	
Total Split (%)	8.3%	38.3%	13.3%	16.7%	46.7%		13.3%	45.0%	16.7%	31.7%	31.7%	
Maximum Green (s)	6.0	41.0	12.0	16.0	51.0		12.0	49.0	16.0	33.0	33.0	
Yellow Time (s)	3.0	4.0	3.0	3.0	4.0		3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	4.0	4.0	5.0		4.0	5.0	4.0	5.0	5.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	None	None	C-Max		None	Max	None	Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		27.0			26.0			26.0		26.0	26.0	
Pedestrian Calls (#/hr)		5			5			5		5	5	
Act Effct Green (s)	6.0	41.0	58.0	16.0	59.0		12.0	49.0	70.0	33.0	33.0	
Actuated g/C Ratio	0.05	0.34	0.48	0.13	0.49		0.10	0.41	0.58	0.28	0.28	
v/c Ratio	0.02	0.79	0.35	0.81	0.48		0.73	0.01	0.35	0.15	0.08	
Control Delay	55.0	41.1	3.0	65.2	21.9		56.5	17.5	7.8	34.3	27.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	55.0	41.1	3.0	65.2	21.9		56.5	17.5	7.8	34.3	27.4	
LOS	D	D	A	E	C		E	B	A	C	C	
Approach Delay		31.5			35.3			28.8			31.6	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	2	346	0	145	208		83	2	52	34	17	
Queue Length 95th (ft)	11	428	47	#215	310		#140	10	90	70	45	
Internal Link Dist (ft)		584			643			1794			238	
Turn Bay Length (ft)	150			220			225		230	100		
Base Capacity (vph)	88	1209	930	457	1736		343	760	946	386	501	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.02	0.79	0.35	0.81	0.48		0.73	0.01	0.35	0.15	0.08	

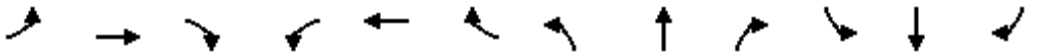
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 74 (62%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 32.5 Intersection LOS: C
Intersection Capacity Utilization 63.2% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.

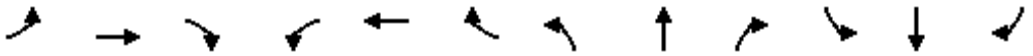
Queue shown is maximum after two cycles.

Splits and Phases: 3: Associated Rd & Birch St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	889	300	300	1248	17	483	34	367	11	21	6
Future Volume (vph)	12	889	300	300	1248	17	483	34	367	11	21	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	220		0	225		230	100		0
Storage Lanes	1		1	2		0	1		1	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.998				0.850		0.967	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	3433	3532	0	3433	1863	1583	1770	1801	0
Flt Permitted	0.950			0.950			0.950			0.735		
Satd. Flow (perm)	1770	3539	1583	3433	3532	0	3433	1863	1583	1369	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			300		1				55		6	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		664			723			1874			318	
Travel Time (s)		15.1			16.4			42.6			7.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	12	889	300	300	1248	17	483	34	367	11	21	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	889	300	300	1265	0	483	34	367	11	27	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Perm	NA	
Protected Phases	7	4	5	3	8		5	2	3		6	
Permitted Phases			4						2	6		



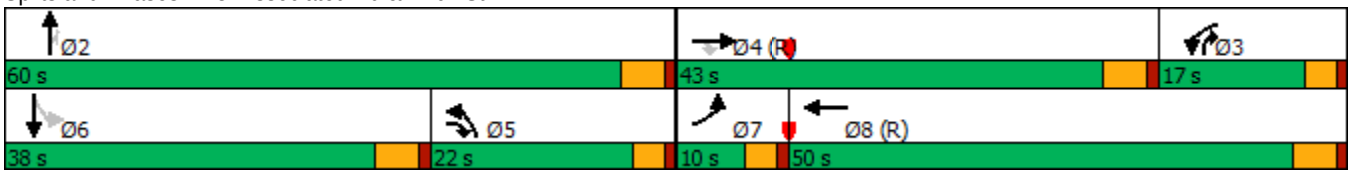
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8		5	2	3	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	39.0	10.0	10.0	38.0		10.0	38.0	10.0	38.0	38.0	
Total Split (s)	10.0	43.0	22.0	17.0	50.0		22.0	60.0	17.0	38.0	38.0	
Total Split (%)	8.3%	35.8%	18.3%	14.2%	41.7%		18.3%	50.0%	14.2%	31.7%	31.7%	
Maximum Green (s)	6.0	38.0	18.0	13.0	45.0		18.0	55.0	13.0	33.0	33.0	
Yellow Time (s)	3.0	4.0	3.0	3.0	4.0		3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	4.0	4.0	5.0		4.0	5.0	4.0	5.0	5.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	None	None	C-Max		None	Max	None	Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		27.0			26.0			26.0		26.0	26.0	
Pedestrian Calls (#/hr)		5			5			5		5	5	
Act Effct Green (s)	6.0	38.0	61.0	13.0	51.0		18.0	55.0	73.0	33.0	33.0	
Actuated g/C Ratio	0.05	0.32	0.51	0.11	0.42		0.15	0.46	0.61	0.28	0.28	
v/c Ratio	0.14	0.79	0.32	0.81	0.84		0.94	0.04	0.37	0.03	0.05	
Control Delay	58.2	43.7	2.7	69.7	38.1		73.1	15.8	9.3	32.3	27.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	58.2	43.7	2.7	69.7	38.1		73.1	15.8	9.3	32.3	27.1	
LOS	E	D	A	E	D		E	B	A	C	C	
Approach Delay		33.6			44.1			44.4			28.6	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	9	330	0	119	424		191	14	111	6	12	
Queue Length 95th (ft)	30	410	44	#186	#649		#302	29	139	21	36	
Internal Link Dist (ft)		584			643			1794			238	
Turn Bay Length (ft)	150			220			225		230	100		
Base Capacity (vph)	88	1120	952	371	1501		514	853	984	376	499	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.14	0.79	0.32	0.81	0.84		0.94	0.04	0.37	0.03	0.05	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 86 (72%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 40.6		Intersection LOS: D	
Intersection Capacity Utilization 72.2%		ICU Level of Service C	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: Associated Rd & Birch St



APPENDIX H

TRAFFIC SIGNAL WARRANT WORKSHEETS

APPENDIX H-I

YEAR 2024 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

Signal Warrants Report For Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	505	623	41
2	490	604	40
3	480	592	39
4	449	554	36
5	399	492	32
6	394	486	32
7	389	480	32
8	354	436	29
9	348	430	28
10	343	424	28
11	298	368	24
12	278	343	23
13	273	336	22
14	202	249	16
15	202	249	16
16	141	174	11
17	81	100	7
18	81	100	7
19	45	56	4
20	25	31	2
21	15	19	1
22	5	6	0
23	5	6	0
24	5	6	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	1128	2	41	No	No	No	No	No	No	No	No	No	No
2	5	1094	2	40	No	No	No	No	No	No	No	No	No	No
3	5	1072	2	39	No	No	No	No	No	No	No	No	No	No
4	5	1003	2	36	No	No	No	No	No	No	No	No	No	No
5	5	891	2	32	No	No	No	No	No	No	No	No	No	No
6	5	880	2	32	No	No	No	No	No	No	No	No	No	No
7	5	869	2	32	No	No	No	No	No	No	No	No	No	No
8	5	790	2	29	No	No	No	No	No	No	No	No	No	No
9	5	778	2	28	No	No	No	No	No	No	No	No	No	No
10	5	767	2	28	No	No	No	No	No	No	No	No	No	No
11	5	666	2	24	No	No	No	No	No	No	No	No	No	No
12	5	621	2	23	No	No	No	No	No	No	No	No	No	No
13	5	609	2	22	No	No	No	No	No	No	No	No	No	No
14	5	451	2	16	No	No	No	No	No	No	No	No	No	No
15	5	451	2	16	No	No	No	No	No	No	No	No	No	No
16	5	315	2	11	No	No	No	No	No	No	No	No	No	No
17	5	181	2	7	No	No	No	No	No	No	No	No	No	No
18	5	181	2	7	No	No	No	No	No	No	No	No	No	No
19	5	101	2	4	No	No	No	No	No	No	No	No	No	No
20	5	56	2	2	No	No	No	No	No	No	No	No	No	No
21	5	34	2	1	No	No	No	No	No	No	No	No	No	No
22	5	11	2	0	No	No	No	No	No	No	No	No	No	No
23	5	11	2	0	No	No	No	No	No	No	No	No	No	No
24	5	11	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	14.2
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:09
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	41
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1169
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	686	779	157
2	665	756	152
3	652	740	149
4	611	693	140
5	542	615	124
6	535	608	122
7	528	600	121
8	480	545	110
9	473	538	108
10	466	530	107
11	405	460	93
12	377	428	86
13	370	421	85
14	274	312	63
15	274	312	63
16	192	218	44
17	110	125	25
18	110	125	25
19	62	70	14
20	34	39	8
21	21	23	5
22	7	8	2
23	7	8	2
24	7	8	2

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	1465	2	157	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
2	5	1421	2	152	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3	5	1392	2	149	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	5	1304	2	140	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
5	5	1157	2	124	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No
6	5	1143	2	122	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No
7	5	1128	2	121	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No
8	5	1025	2	110	No	No	No	No	Yes	Yes	Yes	Yes	No	No
9	5	1011	2	108	No	No	No	No	Yes	Yes	Yes	Yes	No	No
10	5	996	2	107	No	No	No	No	Yes	Yes	Yes	Yes	No	No
11	5	865	2	93	No	No	No	No	No	Yes	Yes	Yes	No	No
12	5	805	2	86	No	No	No	No	No	Yes	Yes	Yes	No	No
13	5	791	2	85	No	No	No	No	No	Yes	Yes	Yes	No	No
14	5	586	2	63	No	No	No	No	No	No	No	Yes	No	No
15	5	586	2	63	No	No	No	No	No	No	No	Yes	No	No
16	5	410	2	44	No	No	No	No	No	No	No	No	No	No
17	5	235	2	25	No	No	No	No	No	No	No	No	No	No
18	5	235	2	25	No	No	No	No	No	No	No	No	No	No
19	5	132	2	14	No	No	No	No	No	No	No	No	No	No
20	5	73	2	8	No	No	No	No	No	No	No	No	No	No
21	5	44	2	5	No	No	No	No	No	No	No	No	No	No
22	5	15	2	2	No	No	No	No	No	No	No	No	No	No
23	5	15	2	2	No	No	No	No	No	No	No	No	No	No
24	5	15	2	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	4	7	10	13	13	15	4	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	17
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:44
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	157
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1622
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

APPENDIX H-II

YEAR 2045 GENERAL PLAN BUILDOUT PLUS PROJECT TRAFFIC CONDITIONS

Signal Warrants Report For Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	529	664	42
2	513	644	41
3	503	631	40
4	471	591	37
5	418	525	33
6	413	518	33
7	407	511	32
8	370	465	29
9	365	458	29
10	360	452	29
11	312	392	25
12	291	365	23
13	286	359	23
14	212	266	17
15	212	266	17
16	148	186	12
17	85	106	7
18	85	106	7
19	48	60	4
20	26	33	2
21	16	20	1
22	5	7	0
23	5	7	0
24	5	7	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	1193	2	42	No	No	No	No	No	No	No	No	No	No
2	5	1157	2	41	No	No	No	No	No	No	No	No	No	No
3	5	1134	2	40	No	No	No	No	No	No	No	No	No	No
4	5	1062	2	37	No	No	No	No	No	No	No	No	No	No
5	5	943	2	33	No	No	No	No	No	No	No	No	No	No
6	5	931	2	33	No	No	No	No	No	No	No	No	No	No
7	5	918	2	32	No	No	No	No	No	No	No	No	No	No
8	5	835	2	29	No	No	No	No	No	No	No	No	No	No
9	5	823	2	29	No	No	No	No	No	No	No	No	No	No
10	5	812	2	29	No	No	No	No	No	No	No	No	No	No
11	5	704	2	25	No	No	No	No	No	No	No	No	No	No
12	5	656	2	23	No	No	No	No	No	No	No	No	No	No
13	5	645	2	23	No	No	No	No	No	No	No	No	No	No
14	5	478	2	17	No	No	No	No	No	No	No	No	No	No
15	5	478	2	17	No	No	No	No	No	No	No	No	No	No
16	5	334	2	12	No	No	No	No	No	No	No	No	No	No
17	5	191	2	7	No	No	No	No	No	No	No	No	No	No
18	5	191	2	7	No	No	No	No	No	No	No	No	No	No
19	5	108	2	4	No	No	No	No	No	No	No	No	No	No
20	5	59	2	2	No	No	No	No	No	No	No	No	No	No
21	5	36	2	1	No	No	No	No	No	No	No	No	No	No
22	5	12	2	0	No	No	No	No	No	No	No	No	No	No
23	5	12	2	0	No	No	No	No	No	No	No	No	No	No
24	5	12	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	14.6
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:10
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	42
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1235
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 8: S. Associated Rd at Brea Plaza Dwy 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	725	832	153
2	703	807	148
3	689	790	145
4	645	740	136
5	573	657	121
6	566	649	119
7	558	641	118
8	507	582	107
9	500	574	106
10	493	566	104
11	428	491	90
12	399	458	84
13	392	449	83
14	290	333	61
15	290	333	61
16	203	233	43
17	116	133	24
18	116	133	24
19	65	75	14
20	36	42	8
21	22	25	5
22	7	8	2
23	7	8	2
24	7	8	2

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	1557	2	153	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
2	5	1510	2	148	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3	5	1479	2	145	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	5	1385	2	136	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No
5	5	1230	2	121	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No
6	5	1215	2	119	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No
7	5	1199	2	118	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No
8	5	1089	2	107	No	No	No	No	Yes	Yes	Yes	Yes	No	No
9	5	1074	2	106	No	No	No	No	Yes	Yes	Yes	Yes	No	No
10	5	1059	2	104	No	No	No	No	Yes	Yes	Yes	Yes	No	No
11	5	919	2	90	No	No	No	No	No	Yes	Yes	Yes	No	No
12	5	857	2	84	No	No	No	No	No	Yes	Yes	Yes	No	No
13	5	841	2	83	No	No	No	No	No	Yes	Yes	Yes	No	No
14	5	623	2	61	No	No	No	No	No	No	No	Yes	No	No
15	5	623	2	61	No	No	No	No	No	No	No	Yes	No	No
16	5	436	2	43	No	No	No	No	No	No	No	No	No	No
17	5	249	2	24	No	No	No	No	No	No	No	No	No	No
18	5	249	2	24	No	No	No	No	No	No	No	No	No	No
19	5	140	2	14	No	No	No	No	No	No	No	No	No	No
20	5	78	2	8	No	No	No	No	No	No	No	No	No	No
21	5	47	2	5	No	No	No	No	No	No	No	No	No	No
22	5	15	2	2	No	No	No	No	No	No	No	No	No	No
23	5	15	2	2	No	No	No	No	No	No	No	No	No	No
24	5	15	2	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	3	7	10	13	13	15	4	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	17.1
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:43
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	153
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1710
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

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Traffic Circulation Assessment

June 17, 2021

Nicole Vermilion, Associate Principal
Placeworks
3 MacArthur Place, Suite 1100
Santa Ana, CA 92707

LLG Reference: 2.19.4157.1

Subject: **Revised Vehicle Miles Traveled (VMT) Screening Assessment for The Brea Plaza Expansion Project**
Brea, California

Dear Ms. Vermilion,

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit this Revised Vehicle Miles Traveled (VMT) Screening Assessment for the Brea Plaza Expansion Project, hereinafter referred to as the Project. Brea Plaza is an existing retail center addressed at 409-477 S. Associated Road and 1555, 1609, 1623, 1643 E. Imperial Highway that is generally located north of Imperial Highway, west of Associated Road, and east of SR-57 Freeway in the City of Brea, California. ***Figure 1*** presents a Vicinity Map, which illustrates the general location of the proposed Project and the surrounding street system. ***Figure 2*** presents an aerial depiction of the existing site.

The existing Brea Plaza includes 165,329 square-feet (SF) of floor area consisting of mixture of retail/commercial use, service/retail shops, a movie theatre, restaurant/ food uses and fast-food restaurants with drive-through. The proposed Project includes a mixed-use development that consists of 21,355 SF of office space and 189 apartment units. Fifteen (15) of the proposed apartments are considered co-living units, which include five (5) 3-bedroom units and ten (10) four-bedroom units, therefore, to provide a conservative assessment, the co-living unit bedrooms have been counted as individual units for a total apartment count of 229 units. The implementation of the Project would require the demolition of the existing 18,450 SF movie theatre (Brea Plaza 5 Cinemas). ***Figure 3*** presents the proposed project site plan.

SB743 COMPLIANCE VMT SCREENING ASSESSMENT

The purpose of this Vehicle Miles Traveled (VMT) analysis is to evaluate the Project based on Senate Bill 743 (SB 743) requirements consistent with the *Technical Advisory on Evaluating Transportation Impacts In California Environmental Quality Act* (CEQA), December 2018, prepared by the State of California Governor's Office of Planning and Research (OPR). The OPR Technical Advisory provides project screening criteria and guidance for analysis of VMT assessments under SB 743. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled which took effect July 1, 2020, as required in CEQA section 15064.3.

The City of Brea adopted VMT guidelines in October 2020 which are consistent with the OPR Technical Advisory which states projects generating less than 110 daily vehicle trips may be presumed to have a less than significant impact. As outlined in ***Table 1,*** the proposed Project to replace the existing movie theater with apartments and office space is anticipated to result in a net reduction in site generated traffic of approximately 1,680 trips on a typical weekday. Since the construction of the proposed Project will result in a net reduction of daily vehicle trips to and from the site, it can be assumed that vehicle miles traveled would also be reduced and thus the project will have no significant negative impact on the transportation system and no further study is recommended or required.

CONCLUSION

Based on the conduct of a trip generation assessment, the proposed Project is anticipated to generate less than 110 daily vehicle trips. Therefore, in accordance with the City of Brea's Transportation Impact Analysis Guidelines, the proposed Project is exempt from the conduct of any further analysis, and it is assumed that its implementation will not result in any significant CEQA related transportation impacts.

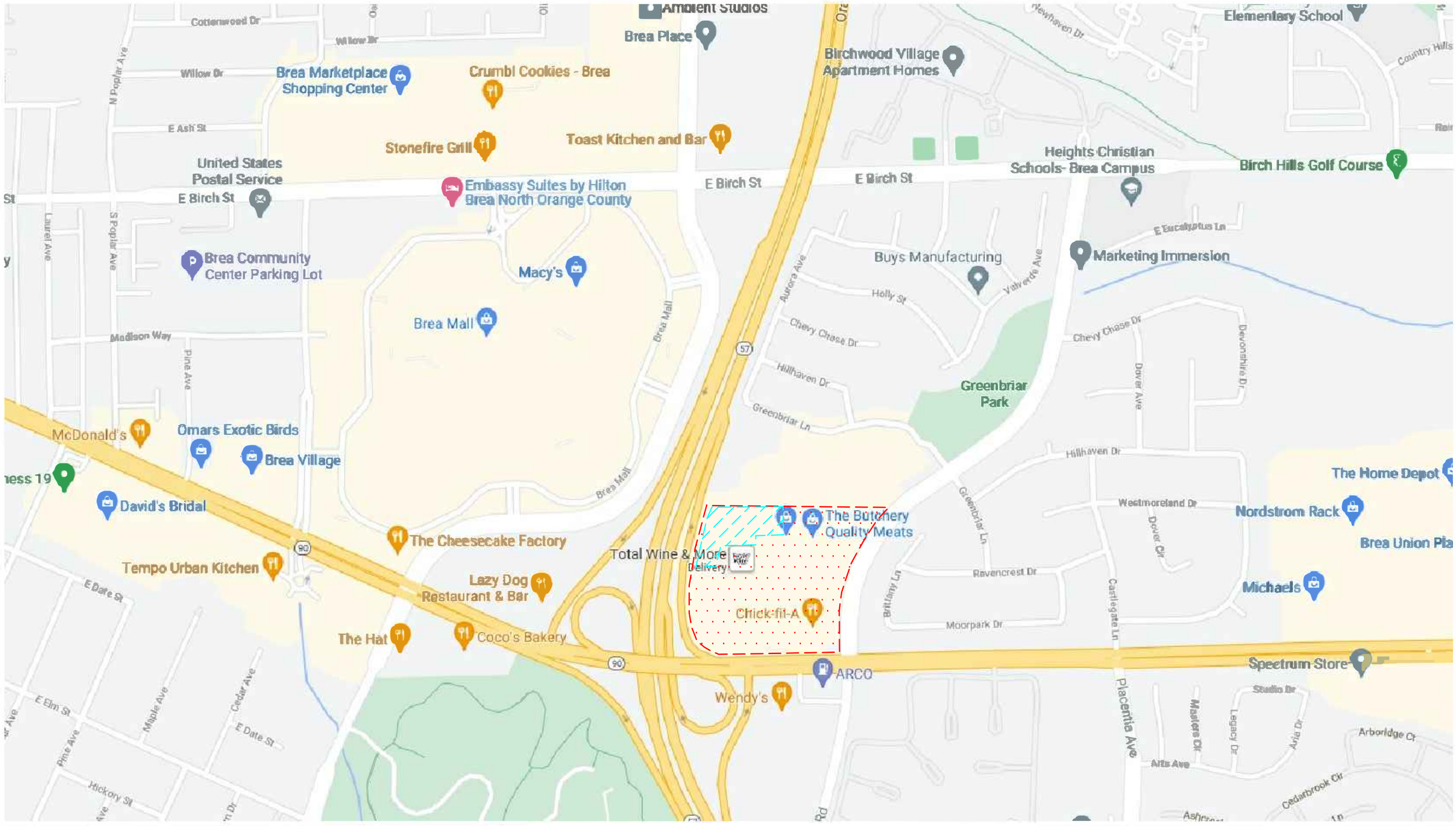
* * * * * * * * * *

We appreciate the opportunity to be of service on this Project. Should you need further assistance, or have any questions regarding this analysis, please call us at (949) 825-6175.

Very truly yours,
Linscott, Law & Greenspan, Engineers

Richard E. Barretto, P.E.
Principal

cc: Shane S. Green, P.E., LLG



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N NO SCALE

SOURCE: GOOGLE

KEY

= BREA PLAZA

= PROJECT AREA

FIGURE 1

VICINITY MAP

BREA PLAZA EXPANSION PROJECT, BREA

SOURCE: GOOGLE

KEY

BREA PLAZA

PROJECT AREA

N

NO SCALE

FIGURE 2

EXISTING SITE AERIAL

BREA PLAZA EXPANSION PROJECT, BREA

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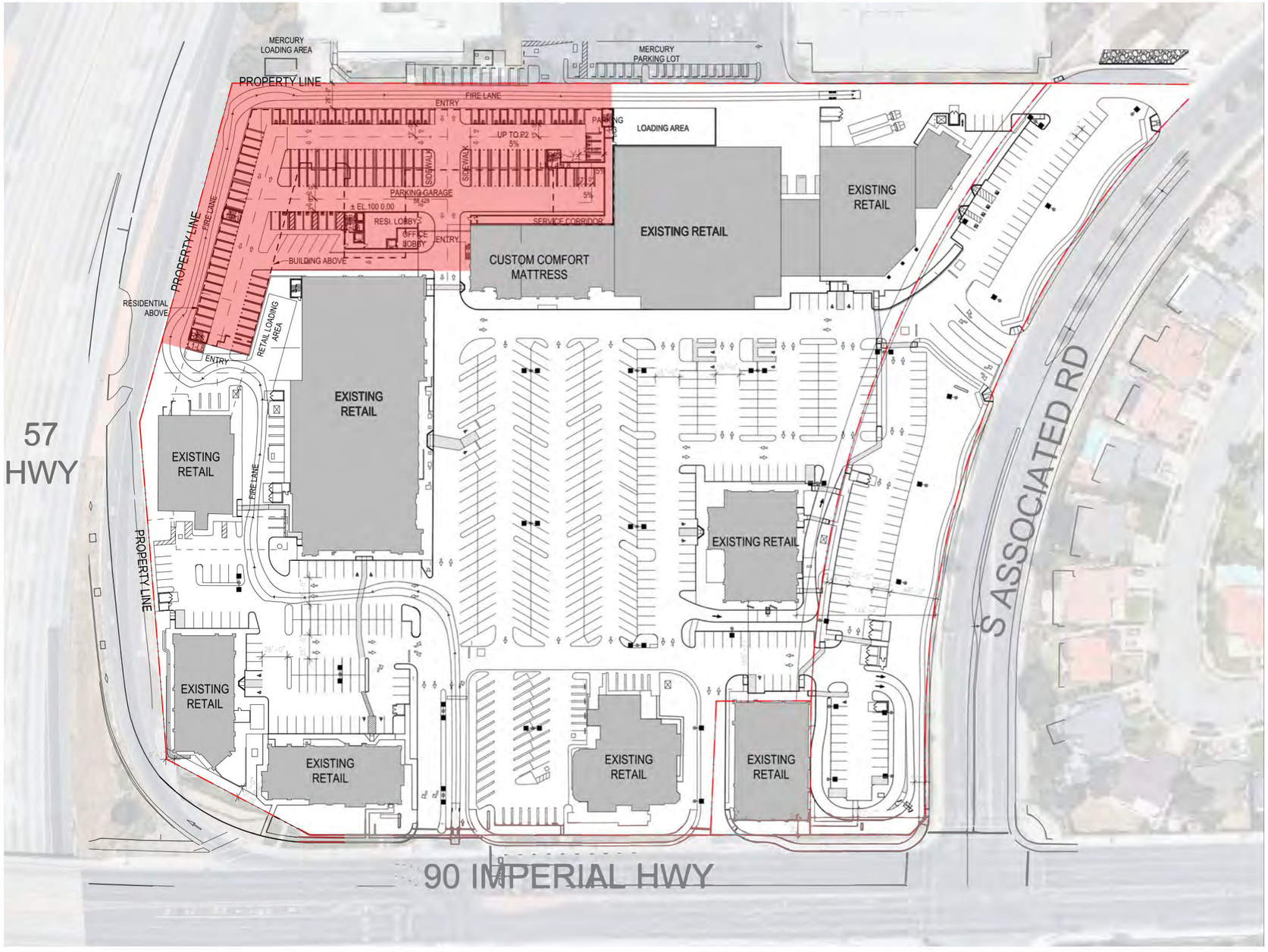

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SOURCE: ARCHITECTS ORANGE

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

FIGURE 3

PROPOSED SITE PLAN

BREA PLAZA EXPANSION PROJECT, BREA

TABLE 1

PROJECT TRIP GENERATION FORECAST – ENTIRE BREA PLAZA[1]

Project Description	Weekday							Saturday			
	Daily	AM Peak Hour			PM Peak Hour			Daily	Midday Peak Hour		
	2-Way	Enter	Exit	Total	Enter	Exit	Total	2-Way	Enter	Exit	Total
Trip Generation Rates											
▪ 221: Multifamily Housing (Mid-Rise) (TE/DU)	5.44	26%	74%	0.36	61%	39%	0.44	4.91	49%	51%	0.44
▪ 444: Movie Theater (TE/Seat)	1.76	--	--	--	55%	45%	0.09	2.24	56%	44%	0.46
▪ 710: General Office Building (TE/TSF)	9.74	86%	14%	1.16	16%	84%	1.15	2.21	54%	46%	0.53
▪ 820: Shopping Center (TE/TSF GLA)	Eq.[2]	62%	38%	Eq.[2]	48%	52%	Eq.[2]	Eq.[2]	52%	48%	Eq.[2]
Existing Brea Plaza											
▪ Existing Shopping Center (146,879 SF)	7,808	140	85	225	347	375	722	11,311	403	436	839
Pass-by Reduction[3]	-781	-14	-9	-23	-118	-127	-245	-1,131	-40	-44	-84
Existing Shopping Center Total	**7,027**	**126**	**76**	**202**	**229**	**248**	**477**	**10,180**	**363**	**392**	**755**
▪ Existing Theater (1,100 seats)	1,936	--	--	--	54	45	99	2,464	283	223	506
Existing Brea Plaza Total	**8,963**	**126**	**76**	**202**	**283**	**293**	**576**	**12,644**	**646**	**615**	**1,261**
Proposed Brea Plaza											
▪ Proposed Shopping Center (146,879 SF)	7,808	140	85	225	347	375	722	11,311	403	436	839
Internal Capture[4]	-602	-2	-1	-3	-20	-30	-50	-507	-23	-25	-48
Subtotal	7,206	138	84	222	327	345	672	10,804	380	411	791
Pass-by Reduction[3]	-721	-14	-8	-22	-111	-117	-228	-1,080	-38	-41	-79
Proposed Shopping Center Total	**6,485**	**124**	**76**	**200**	**216**	**228**	**444**	**9,724**	**342**	**370**	**712**
▪ Proposed Residential (229 DU)	1,246	21	61	82	62	39	101	1,124	49	52	101
Internal Capture[4]	-576	0	-2	-2	-29	-18	-47	-508	-23	-24	-47
Proposed Residential Total	**670**	**21**	**59**	**80**	**33**	**21**	**54**	**616**	**26**	**28**	**54**
▪ Proposed Office (21,355 SF)	208	22	3	25	4	21	25	47	6	5	11
Internal Capture[4]	-80	-2	-1	-3	-3	-4	-7	-25	-4	-1	-5
Proposed Office Total	**128**	**20**	**2**	**22**	**1**	**17**	**18**	**22**	**2**	**4**	**6**
Proposed Brea Plaza Total	**7,283**	**165**	**137**	**302**	**250**	**266**	**516**	**10,362**	**370**	**402**	**772**
Net Trip Generation (Proposed Brea Plaza - Existing Brea Plaza)	**-1,680**	**39**	**61**	**100**	**-33**	**-27**	**-60**	**-2,282**	**-276**	**-213**	**-489**

Notes:

- TE/TSF = Trip End per Thousand Square Feet Gross Leasable Area
- TE/DU = Trip End per Dwelling Unit
- TE/Seat = Trip End per Seat

1 Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).

2 Trip Generation rates based on the following equations:
- Weekday Daily: Ln(T) = 0.68Ln(X) + 5.57
- Weekday AM Peak Hour: T = 0.50(X) + 151.78
- Weekday PM Peak Hour: Ln(T) = 0.74Ln(X) + 2.89
- Saturday Daily: Ln(T) = 0.62Ln(X) + 6.24
- Saturday Peak Hour of Generator: Ln(T) = 0.79Ln(X) + 2.79

3 Pass-By Trips are trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on adjacent streets, which contain direct access to the generator. For this analysis, the following pass-by reduction factors were used (Source: *Trip Generation Handbook,3rd Edition*, ITE 2017):
- 820: Shopping Center: PM Peak Hour – 34%, Daily/AM peak hour/Saturday Daily/Saturday Midday Peak Hour – Assume 10%

4 Consistent with the *Trip Generation Handbook,* published by ITE (2017), Project trip generation was adjusted to account for internal capture between the retail and residential components of the Project. As there are no Saturday internal capture worksheets available, Weekday Daily and Weekday PM peak hour calculations have been applied to Saturday Daily and Saturday Midday peak hour.

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Attachment G:

Sewer Studies

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G.1 - FEIR Sewer Study

C.A. ENGINEERING, INC.

Planning • Engineering • Surveying

SEWER STUDY

FOR

Brea Plaza Redevelopment Project
1639 E. Imperial Highway
Brea, CA 92821

City of Brea

Preparation Date: March 5th, 2021
Revised: May 25th, 2021
Revised: June 22nd, 2021

PLANS PREPARED UNDER THE SUPERVISION OF:

6/22/21

Fred Cornwell, P.E. - R.C.E 45591 **Date**

13821 Newport Ave., Su. 110• Tustin, CA 92780 • Phone (949) 724-9480 • Fax (949) 724-9484

Proposed Site

The proposed project consists of redeveloping 2.2 acres of the approximately 13.7 acre existing retail site known as the Brea Plaza. The proposed project will involve the demolition of the movie theater building, as well as the asphalt drive aisles/parking areas, concrete walkways, and landscaped planters within the project area, and the construction of one eight-story apartment building.

The upper five stories of the building will contain 189 residential apartments (of which 15 are co-living units), and the lower three stories will consist of concrete podium parking. A roof garden and pool will be located on the fourth level of the building. The project will also include asphalt drive aisles, a concrete loading dock area, and concrete walkways. In addition, the proposed development will construct a two-story office building over a portion of an existing multi-tenant retail building, and a one-story office building over a portion of the existing Custom Comfort Mattress store.

The existing on-site sewer system will be utilized, and, if necessary, improved to provide adequate conveyance for the increased sewer flow.

Methodology

This sewer report is prepared to quantify the existing and proposed flows tributary to the proposed and existing sewers which will serve the proposed project. The City of Brea design flow criteria from the 2005 Sewer Master Plan will be used to calculate the proposed gallons per day (GPD) that the new development will contribute to the existing sewer system. In addition, the design criteria will also be used to estimate the amount of existing tributary flows that the various upstream residences, schools, offices, etc. are contributing to the downstream sewer connection.

This estimate of existing flows will be compared to actual monitoring data which was conducted on the previously mentioned downstream connection manhole location on Imperial Avenue. Finally, we will analyze the impact that the “calculated” additional flows will have on each section of the sewer system. We will be using the computer program “FlowMaster v5.15” produced by Haestad Methods to perform these calculations.

Existing Flows:

The average dry weather existing sewer flow rates were calculated using the unit flow factors contained in Table 1 of the City of Brea Design Standards. Results are summarized below in "Table A" and show that Brea Plaza is currently produces a total of 75,446 Gallons per day (GPD). All sewer flows from Brea Plaza are directed to the Imperial Avenue Manhole. This manhole also serves as a junction for upstream sewer flows from surrounding tributary areas.

The attached "Exhibit A" uses the City of Brea sewer atlas to give a visual representation of how the surrounding tributary areas were counted, and how they flow downstream to the Imperial Avenue manhole. Per "Table A" below the surrounding tributary areas produce a total average dry weather flow of 492,816 GPD.

In total, the average dry weather (Qadw) existing sewer flow rate is 568,262 GPD or 0.88 cfs. Using the City of Brea Design Standards this 0.88 cfs can be converted from average dry weather to peak dry weather (Qpdw) using the formula Qpdw = (1.84)*(Qadw^.92). Similarly, peak dry weather is converted to peak wet weather (Qpww) using the formula Qpww = 1.25*Qpdw. The converted values shown in "Table B" result in a peak dry weather value of 1.63 cfs, and a peak wet weather value of 2.04 cfs.

Table A: Average Dry Weather Existing Flow Rates
(Utilizing the City of Brea's Design Guidelines)

Brea Plaza						
Existing	Type	Area/Seats	Unit Flow Factor	GPD	CFS	Sewer Sections Tributary To
Mercury Insurance	General Offices	93605 SF (2 Stories)	73.5 GPD/TSF	13,760	0.021	A-F
Grocery/ Market	General Commercial	16,213 SF	73.5 GPD/TSF	1,192	0.002	A-F
Tux/ Beauty Shop	General Commercial	3,143 SF	73.5 GPD/TSF	231	0.000	A-F
Total Wine/ Other	Shopping Center	37,505 SF	73.5 GPD/TSF	2,757	0.004	A-F
Buca Di Beppo	Restaurant	7,672 SF	1575 GPD/TSF	12,083	0.019	B-F
Fed-Ex/ Sushi/Other	General Commercial	8,015 SF	73.5 GPD/TSF	589	0.001	C-F
Creamistry/ Wax	General Commercial	6,781 SF	73.5 GPD/TSF	498	0.001	C-F
Lucilles Bbq	Restaurant	10,487 SF	1575 GPD/TSF	16,517	0.026	D-F
Brea Plaza 5 Cinema (To Be Removed)	Theater	~1125 Seats	8.4 GPD/SEAT	9,450	0.015	E-F
Shopping Center	Shopping Center	37,753 SF	73.5 GPD/TSF	2,775	0.004	E-F
Fish Grill/ Panera	Restaurant	9,491 SF	1575 GPD/TSF	14,948	0.023	E-F
Att/ Chick-Fil-A	General Commercial	8,789 SF	73.5 GPD/TSF	646	0.001	F
			Brea Plaza Total	**75,446**	**0.117**	

Surrounding Areas					
Existing	Type	Area/DU	Unit Flow Factor	GPD	CFS
R1	Low Density Residential	323	270 GPD/DU	87,210	0.135
R2	Medium Density Residential	1014	248 GPD/DU	251,472	0.389
R3	High Density Residential	573	210 GPD/DU	120,330	0.186
CP	General Offices	406,726 SF	73.5 GPD/TSF	29,894	0.046
C-RC	Commercial Recreational	7.726 AC	3.15 GPD/AC	24	0.000
SCH	Schools	370	10.5 GPD/Student	3,885	0.006
		Surrounding Areas Total		**492,816**	**0.762**
		Total Existing		**568,262**	**0.879**

Table B: Existing Flow Rate Conversion – Average Dry Weather to Peak Wet Weather (Utilizing the City of Brea's Design Guidelines)

Calculated Flow Rates		GPD	CFS
Avg Dry Weather:	Qadw	568,262	0.88
Peak Dry Weather:	Qpdw (1.84*Qadw^.92)		1.63
Peak Wet Weather:	Qpww (1.25*Qpdw)		2.04

Table C: Imperial Avenue Manhole Monitored Flow Rates

Monitored Flow Rates	GPM	GPD	CFS
Average	283.07	407,621	0.63
Minimum	82.15		0.18
Maximum	491.18		1.09

The Imperial Avenue manhole was monitored under dry weather conditions from October 28th to November 5th, 2020. Results from this monitoring are shown in "Appendix B" and are summarized in "Table C" above. An average of 283.07 GPM or 407,621 GPD was monitored; 72% of the "calculated" average dry weather flow rate of 568,262 GPD. This monitored average dry weather flow rate of 283.07 GPM is equivalent to 0.63 cfs. "Table C" also shows the peak dry weather monitored flow rate of 1.09 cfs. Since this monitored peak dry weather flow rate of 1.09 cfs is lower than the "calculated" peak dry weather flow rate of 1.63 cfs; the more conservative "calculated" values will be used to analyze the sewer segments in the subsequent sections of this report.

Proposed Flows:

For the new proposed development, the average dry weather sewer flow rates were calculated using the unit flow factors contained in Table 4-2 of the City of Brea 2005 Sewer Master Plan. To calculate the proposed flows the 189 residential units were separated into 174 single units and 15 co-living units. Ten of the co-living units have 4 bedrooms for a product of 40 units; while 5 co-living units have 3 bedrooms for a product of 15 units. The 174 single units and 55 co-living units were using in the proposed flow rate calculations for a total of 229 units.

Results of the proposed flow rate calculations are summarized in "Table D" below and show that the new proposed development will add 49,658 Gallons per day (GPD) to the existing sewer system. However, since the existing Theater is being demolished, the 9,450 GPD it produces (see table "A") will be deducted for a net total of 40,208 GPD.

Table D: Average Dry Weather Proposed Flow Rates (Utilizing the City of Brea's Design Guidelines)

Proposed Apartment Calculations					
Floor/Level	Type	Dwelling Units	Unit Flow Factor	GPD	CFS
3-7	Single Units	174	210 GPD/DU	36,540	0.057
3-7	Co-Living Units	55	210 GPD/DU	11,550	0.018
Proposed Office Calculations					
Floor/Level	Type	Area (SF)	Unit Flow Factor	GPD	CFS
2-4	Offices	21,335	73.5 GPD/TSF	1,568	0.002
			Total Proposed	**49,658**	**0.077**
Reduction of Theater Flows Due to Building Removal					
Floor/Level	Type	Dwelling Units	Unit Flow Factor	GPD	CFS
-	Theater	~1,125 Seats	8.4 GPD/Seat	(9,450)	(0.015)
			Net Total	**40,208**	0.062

The "calculated" average dry weather net flow rate of 40,208 GPD for the new development is equivalent to 0.062 cfs. Per "Table E" below, the proposed peak dry weather flow rate is 0.143 cfs, and the proposed peak wet weather flow rate is 0.179 cfs. During the sewer section analysis, these proposed flow rates will be added to the existing flow rates to analyze the impact of the new development on each sewer section.

Table E: Proposed Flow Rate Conversion - Average Dry Weather to Peak Wet Weather (Utilizing the City of Brea's Design Guidelines)

Proposed Flow Rates		GPD	CFS
Avg Dry Weather:	Total GPD (Qadw)	40,208	0.062
Peak Dry Weather:	Qpdw (1.84*Qadw^.92)		0.143
Peak Wet Weather:	Qpww (1.25*Qpdw)		**0.179**

As shown in "Exhibit B", the existing sewer lines will be used to convey Brea Plaza flows from the existing and proposed tributary buildings. The flows are directed southerly where they confluence with flows from the surrounding areas (see "Exhibit A") at the Imperial Ave. manhole. Using "FlowMaster v5.15" the sewer sections shown in "Exhibit B" were analyzed to determine adequate capacity. The FlowMaster output calculations can be found in Appendix A.

Per the City of Brea Design Standards found in the 2005 Sewer Master Plan, for existing pipes the depth to pipe diameter ratio (d/D) shall be a maximum of 0.64 for peak dry weather flow rates, and 0.75 for peak wet weather flow rates.

"Table F" located below summarizes the results of the section analysis. Only peak dry weather and peak wet weather conditions were analyzed. Results show that all of the onsite Brea Plaza

sewer pipe sections (sections A-F) are adequately sized to convey both the existing and proposed flows for each weather condition.

Section G is the critical section since it must convey all of the onsite flows, as well as the flows from the surrounding areas shown in “Exhibit A.” Under peak dry weather conditions the d/D ratio increases from 0.46 to 0.49 as the sewer flow increases from 1.63 cfs to 1.78 cfs. The proposed depth to pipe diameter ratio of 0.49 is well below the design limit of 0.64.

Under peak wet weather conditions the d/D ratio increases from 0.53 to 0.55 as the sewer flow increases from 2.04 cfs to 2.22 cfs. The proposed depth to pipe diameter ratio of 0.55 is well below the design limit of 0.75.

Table F: Sewer Section Flow Table

Average Dry Weather								
SECTION	SIZE (IN)	EX. FLOW (cfs)	PRO. FLOW (cfs)	LENGTH	SLOPE	EX. DEPTH/PIPE DIA. RATIO	PRO. DEPTH/PIPE DIA. RATIO	PRO. VELOCITY (fps)
A	8	0.03	0.09	245.80	0.0092	-	-	-
B	8	0.05	0.11	68.17	0.0089	-	-	-
C	8	0.05	0.11	224.31	0.0058	-	-	-
D	8	0.07	0.14	223.59	0.0104	-	-	-
E	8	0.12	0.18	185.01	0.0314	-	-	-
F	8	0.12	0.18	101.11	0.1266	-	-	-
G	12	0.88	0.94	246.98	0.0110	-	-	-

Peak Dry Weather = 1.84 * Avg Dry Weather ^ 0.92 (Proposed Flows Add an Additional 0.144 cfs)								
SECTION	SIZE (IN)	EX. FLOW (cfs)	PRO. FLOW (cfs)	LENGTH	SLOPE	EX. DEPTH/PIPE DIA. RATIO	PRO. DEPTH/PIPE DIA. RATIO	PRO. VELOCITY (fps)
A	8	0.07	0.21	245.80	0.0092	0.11' / 0.67' = 0.17	0.19' / 0.67' = 0.29	2.52
B	8	0.11	0.25	68.17	0.0089	0.14' / 0.67' = 0.21	0.21' / 0.67' = 0.32	2.62
C	8	0.11	0.26	224.31	0.0058	0.16' / 0.67' = 0.24	0.24' / 0.67' = 0.36	2.27
D	8	0.17	0.31	223.59	0.0104	0.17' / 0.67' = 0.26	0.23' / 0.67' = 0.35	2.94
E	8	0.25	0.40	185.01	0.0314	0.15' / 0.67' = 0.23	0.20' / 0.67' = 0.30	4.70
F	8	0.26	0.40	101.11	0.1266	0.11' / 0.67' = 0.17	0.14' / 0.67' = 0.21	7.71
G	12	1.63	1.78	246.98	0.0110	***0.46' / 1.00' = 0.46***	***0.49' / 1.00' = 0.49***	4.70

Peak Wet Weather = 1.25 * Peak Dry Weather (Proposed Flows Add an Additional 0.180 cfs)								
SECTION	SIZE (IN)	EX. FLOW (cfs)	PRO. FLOW (cfs)	LENGTH	SLOPE	EX. DEPTH/PIPE DIA. RATIO	PRO. DEPTH/PIPE DIA. RATIO	PRO. VELOCITY (fps)
A	8	0.09	0.26	245.8	0.0092	0.13' / 0.67' = 0.20	0.21' / 0.67' = 0.32	2.68
B	8	0.14	0.32	68.17	0.0089	0.16' / 0.67' = 0.24	0.24' / 0.67' = 0.36	2.80
C	8	0.14	0.32	224.31	0.0058	0.18' / 0.67' = 0.27	0.27' / 0.67' = 0.41	2.40
D	8	0.21	0.39	223.59	0.0104	0.19' / 0.67' = 0.29	0.26' / 0.67' = 0.39	3.13
E	8	0.32	0.49	185.01	0.0314	0.17' / 0.67' = 0.26	0.22' / 0.67' = 0.33	4.97
F	8	0.32	0.50	101.11	0.1266	0.12' / 0.67' = 0.18	0.15' / 0.67' = 0.23	8.23
G	12	2.04	2.22	246.98	0.0110	***0.53' / 1.00' = 0.53***	***0.55' / 1.00' = 0.55***	4.96

Conclusion:

As shown in the flow tables, under peak dry weather conditions the proposed flow depth to pipe diameter ratios are well below the 64% limit for the existing 8” and 12” sewer pipes at a maximum ratio of 0.36 and 0.49 respectively.

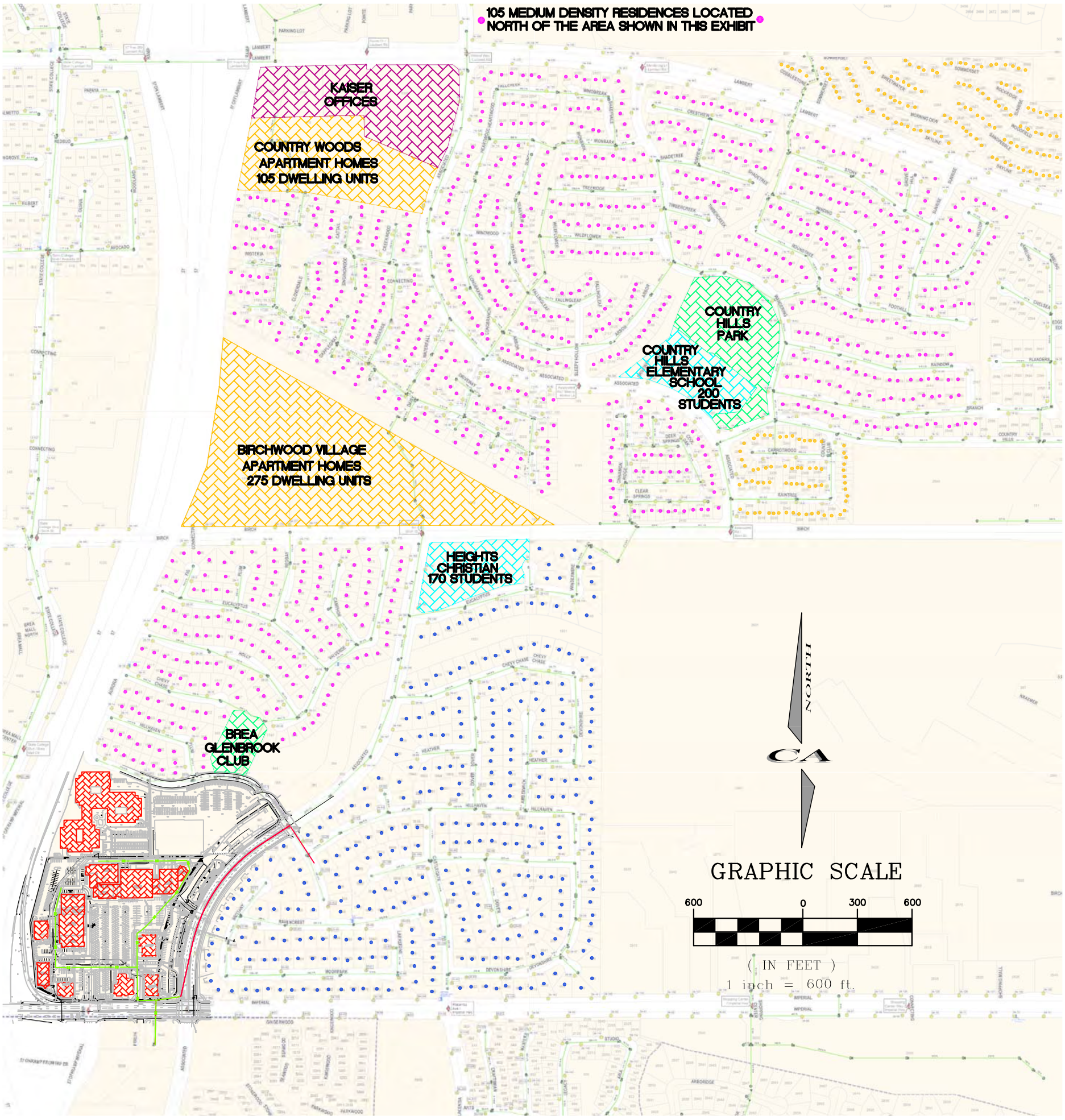
Similarity, under peak wet weather conditions the proposed flow depth to pipe diameter ratios are well below the 75% limit for the existing 8” and 12” sewer pipes at a maximum ratio of 0.41 and 0.55 respectively.

Therefore all existing sewer pipes are currently sized to adequately convey the additional tributary flows from the proposed Brea Plaza development.

EXHIBIT A:
BREA PLAZA SEWER DESIGN FLOW TRIBUTARY AREA MAP

EXHIBIT "A"

BREA PLAZA SEWER DESIGN FLOW ESTIMATION MAP

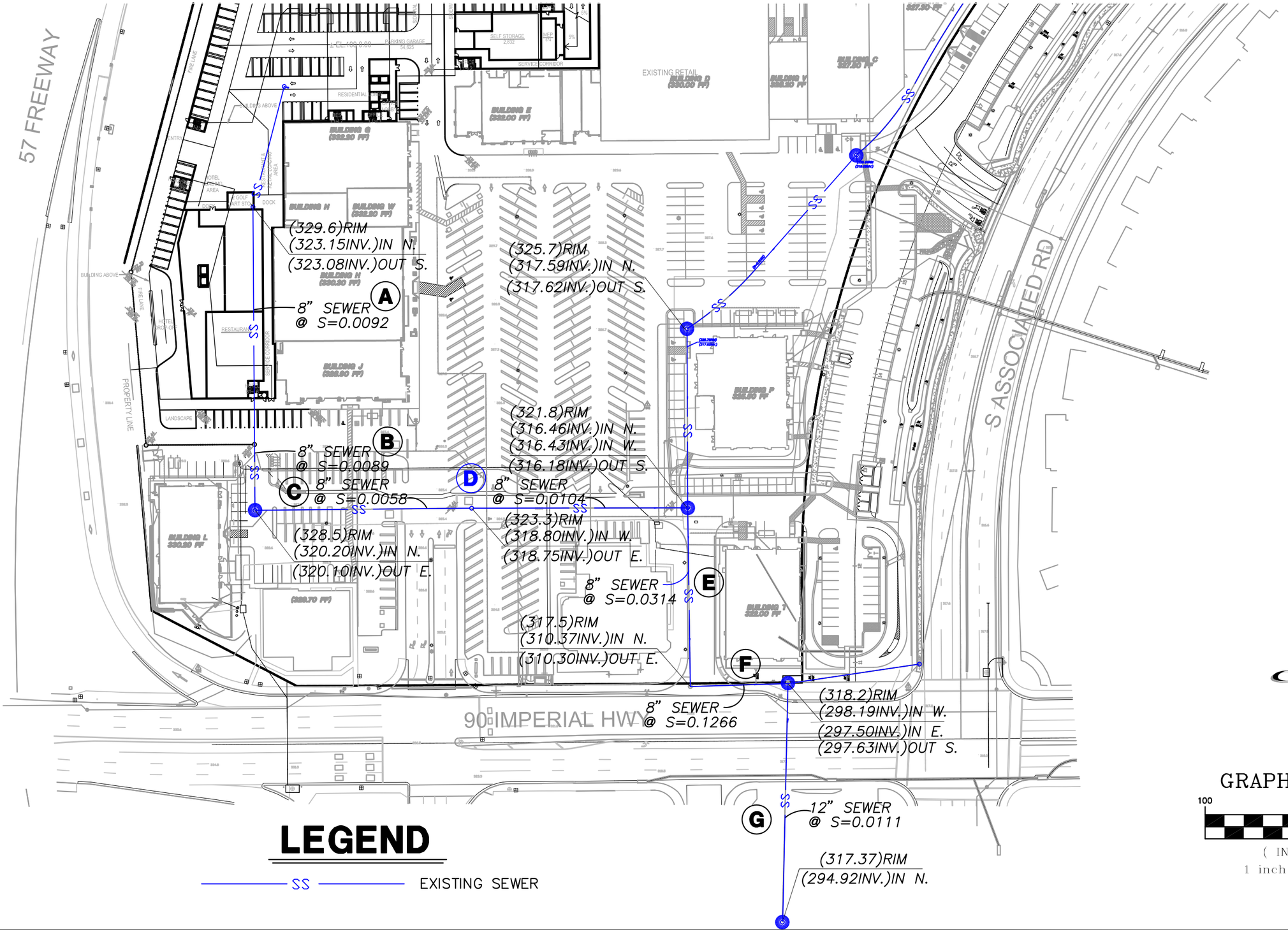


LEGEND

- EXISTING BREA PLAZA BUILDINGS
- COMMERCIAL RECREATIONAL (C–RC)
- SCHOOL (SCH)
- HIGH DENSITY RESIDENTIAL (R3)
- GENERAL OFFICES (CP)
- LOW DENSITY RESIDENTIAL (R1)
- MEDIUM DENSITY RESIDENTIAL (R2)
- HIGH DENSITY RESIDENTIAL (R3)
- SS — PROPOSED/EXISTING SEWER

EXHIBIT B: SEWER SECTION ANALYSIS

EXHIBIT "B": BREA PLAZA SEWER SECTION ANALYSIS



LEGEND

SS EXISTING SEWER

NORTH

CA

GRAPHIC SCALE

100 0 50 100

(IN FEET)

1 inch = 100 ft.

APPENDIX A: FLOW MASTER SEWER CALCULATIONS

Section A: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.009200	ft/ft
Diameter	8.00	in
Discharge	0.07	cfs

Results		
Depth	0.11	ft
Flow Area	0.04	ft^2
Wetted Perimeter	0.56	ft
Top Width	0.50	ft
Critical Depth	0.12	ft
Percent Full	16.67	
Critical Slope	0.006715	ft/ft
Velocity	1.83	ft/s
Velocity Head	0.05	ft
Specific Energy	0.16	ft
Froude Number	1.16	
Maximum Discharge	1.25	cfs
Full Flow Capacity	1.16	cfs
Full Flow Slope	0.000034	ft/ft
Flow is supercritical.		

Section A: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.009200	ft/ft
Diameter	8.00	in
Discharge	0.21	cfs

Results		
Depth	0.19	ft
Flow Area	0.08	ft^2
Wetted Perimeter	0.76	ft
Top Width	0.60	ft
Critical Depth	0.21	ft
Percent Full	28.82	
Critical Slope	0.006430	ft/ft
Velocity	2.52	ft/s
Velocity Head	0.10	ft
Specific Energy	0.29	ft
Froude Number	1.20	
Maximum Discharge	1.25	cfs
Full Flow Capacity	1.16	cfs
Full Flow Slope	0.000302	ft/ft
Flow is supercritical.		

Section B: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.008900	ft/ft
Diameter	8.00	in
Discharge	0.11	cfs

Results		
Depth	0.14	ft
Flow Area	0.05	ft^2
Wetted Perimeter	0.63	ft
Top Width	0.54	ft
Critical Depth	0.15	ft
Percent Full	20.98	
Critical Slope	0.006517	ft/ft
Velocity	2.07	ft/s
Velocity Head	0.07	ft
Specific Energy	0.21	ft
Froude Number	1.16	
Maximum Discharge	1.23	cfs
Full Flow Capacity	1.14	cfs
Full Flow Slope	0.000083	ft/ft
Flow is supercritical.		

Section B: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.008900	ft/ft
Diameter	8.00	in
Discharge	0.25	cfs

Results		
Depth	0.21	ft
Flow Area	0.10	ft^2
Wetted Perimeter	0.80	ft
Top Width	0.62	ft
Critical Depth	0.23	ft
Percent Full	31.82	
Critical Slope	0.006462	ft/ft
Velocity	2.62	ft/s
Velocity Head	0.11	ft
Specific Energy	0.32	ft
Froude Number	1.18	
Maximum Discharge	1.23	cfs
Full Flow Capacity	1.14	cfs
Full Flow Slope	0.000428	ft/ft
Flow is supercritical.		

Section C: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.005800	ft/ft
Diameter	8.00	in
Discharge	0.11	cfs

Results		
Depth	0.16	ft
Flow Area	0.06	ft^2
Wetted Perimeter	0.67	ft
Top Width	0.56	ft
Critical Depth	0.15	ft
Percent Full	23.35	
Critical Slope	0.006519	ft/ft
Velocity	1.78	ft/s
Velocity Head	0.05	ft
Specific Energy	0.20	ft
Froude Number	0.94	
Maximum Discharge	0.99	cfs
Full Flow Capacity	0.92	cfs
Full Flow Slope	0.000083	ft/ft
Flow is subcritical.		

Section C: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.005800	ft/ft
Diameter	8.00	in
Discharge	0.26	cfs

Results		
Depth	0.24	ft
Flow Area	0.11	ft^2
Wetted Perimeter	0.86	ft
Top Width	0.64	ft
Critical Depth	0.24	ft
Percent Full	36.37	
Critical Slope	0.006475	ft/ft
Velocity	2.27	ft/s
Velocity Head	0.08	ft
Specific Energy	0.32	ft
Froude Number	0.95	
Maximum Discharge	0.99	cfs
Full Flow Capacity	0.92	cfs
Full Flow Slope	0.000463	ft/ft
Flow is subcritical.		

Section D: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.010400	ft/ft
Diameter	8.00	in
Discharge	0.17	cfs

Results		
Depth	0.17	ft
Flow Area	0.07	ft^2
Wetted Perimeter	0.70	ft
Top Width	0.58	ft
Critical Depth	0.19	ft
Percent Full	25.09	
Critical Slope	0.006427	ft/ft
Velocity	2.48	ft/s
Velocity Head	0.10	ft
Specific Energy	0.26	ft
Froude Number	1.27	
Maximum Discharge	1.33	cfs
Full Flow Capacity	1.23	cfs
Full Flow Slope	0.000198	ft/ft
Flow is supercritical.		

Section D: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.010400	ft/ft
Diameter	8.00	in
Discharge	0.31	cfs

Results		
Depth	0.23	ft
Flow Area	0.11	ft^2
Wetted Perimeter	0.83	ft
Top Width	0.63	ft
Critical Depth	0.26	ft
Percent Full	34.19	
Critical Slope	0.006548	ft/ft
Velocity	2.94	ft/s
Velocity Head	0.13	ft
Specific Energy	0.36	ft
Froude Number	1.27	
Maximum Discharge	1.33	cfs
Full Flow Capacity	1.23	cfs
Full Flow Slope	0.000658	ft/ft
Flow is supercritical.		

Section E: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.031400	ft/ft
Diameter	8.00	in
Discharge	0.25	cfs

Results		
Depth	0.15	ft
Flow Area	0.06	ft^2
Wetted Perimeter	0.67	ft
Top Width	0.56	ft
Critical Depth	0.23	ft
Percent Full	23.07	
Critical Slope	0.006462	ft/ft
Velocity	4.10	ft/s
Velocity Head	0.26	ft
Specific Energy	0.42	ft
Froude Number	2.20	
Maximum Discharge	2.30	cfs
Full Flow Capacity	2.14	cfs
Full Flow Slope	0.000428	ft/ft
Flow is supercritical.		

Section E: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.031400	ft/ft
Diameter	8.00	in
Discharge	0.40	cfs

Results		
Depth	0.20	ft
Flow Area	0.09	ft^2
Wetted Perimeter	0.76	ft
Top Width	0.61	ft
Critical Depth	0.29	ft
Percent Full	29.28	
Critical Slope	0.006735	ft/ft
Velocity	4.70	ft/s
Velocity Head	0.34	ft
Specific Energy	0.54	ft
Froude Number	2.21	
Maximum Discharge	2.30	cfs
Full Flow Capacity	2.14	cfs
Full Flow Slope	0.001096	ft/ft
Flow is supercritical.		

Section F: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.126600	ft/ft
Diameter	8.00	in
Discharge	0.26	cfs

Results		
Depth	0.11	ft
Flow Area	0.04	ft^2
Wetted Perimeter	0.56	ft
Top Width	0.50	ft
Critical Depth	0.24	ft
Percent Full	16.68	
Critical Slope	0.006475	ft/ft
Velocity	6.79	ft/s
Velocity Head	0.72	ft
Specific Energy	0.83	ft
Froude Number	4.31	
Maximum Discharge	4.62	cfs
Full Flow Capacity	4.30	cfs
Full Flow Slope	0.000463	ft/ft
Flow is supercritical.		

Section F: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.126600	ft/ft
Diameter	8.00	in
Discharge	0.40	cfs

Results		
Depth	0.14	ft
Flow Area	0.05	ft^2
Wetted Perimeter	0.63	ft
Top Width	0.54	ft
Critical Depth	0.29	ft
Percent Full	20.61	
Critical Slope	0.006736	ft/ft
Velocity	7.71	ft/s
Velocity Head	0.92	ft
Specific Energy	1.06	ft
Froude Number	4.38	
Maximum Discharge	4.62	cfs
Full Flow Capacity	4.30	cfs
Full Flow Slope	0.001096	ft/ft
Flow is supercritical.		

Section G: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.011000	ft/ft
Diameter	12.00	in
Discharge	1.63	cfs

Results		
Depth	0.46	ft
Flow Area	0.35	ft^2
Wetted Perimeter	1.49	ft
Top Width	1.00	ft
Critical Depth	0.54	ft
Percent Full	46.20	
Critical Slope	0.006388	ft/ft
Velocity	4.60	ft/s
Velocity Head	0.33	ft
Specific Energy	0.79	ft
Froude Number	1.36	
Maximum Discharge	4.02	cfs
Full Flow Capacity	3.74	cfs
Full Flow Slope	0.002093	ft/ft
Flow is supercritical.		

Section G: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.011000	ft/ft
Diameter	12.00	in
Discharge	1.78	cfs

Results		
Depth	0.49	ft
Flow Area	0.38	ft^2
Wetted Perimeter	1.54	ft
Top Width	1.00	ft
Critical Depth	0.57	ft
Percent Full	48.60	
Critical Slope	0.006567	ft/ft
Velocity	4.70	ft/s
Velocity Head	0.34	ft
Specific Energy	0.83	ft
Froude Number	1.35	
Maximum Discharge	4.02	cfs
Full Flow Capacity	3.74	cfs
Full Flow Slope	0.002496	ft/ft
Flow is supercritical.		

Section A: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.009200	ft/ft
Diameter	8.00	in
Discharge	0.09	cfs

Results		
Depth	0.13	ft
Flow Area	0.05	ft^2
Wetted Perimeter	0.60	ft
Top Width	0.52	ft
Critical Depth	0.14	ft
Percent Full	18.85	
Critical Slope	0.006593	ft/ft
Velocity	1.97	ft/s
Velocity Head	0.06	ft
Specific Energy	0.19	ft
Froude Number	1.17	
Maximum Discharge	1.25	cfs
Full Flow Capacity	1.16	cfs
Full Flow Slope	0.000055	ft/ft
Flow is supercritical.		

Section A: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.009200	ft/ft
Diameter	8.00	in
Discharge	0.26	cfs

Results		
Depth	0.21	ft
Flow Area	0.10	ft^2
Wetted Perimeter	0.80	ft
Top Width	0.62	ft
Critical Depth	0.24	ft
Percent Full	32.19	
Critical Slope	0.006474	ft/ft
Velocity	2.68	ft/s
Velocity Head	0.11	ft
Specific Energy	0.33	ft
Froude Number	1.20	
Maximum Discharge	1.25	cfs
Full Flow Capacity	1.16	cfs
Full Flow Slope	0.000463	ft/ft
Flow is supercritical.		

Section B: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.008900	ft/ft
Diameter	8.00	in
Discharge	0.14	cfs

Results		
Depth	0.16	ft
Flow Area	0.06	ft^2
Wetted Perimeter	0.68	ft
Top Width	0.57	ft
Critical Depth	0.17	ft
Percent Full	23.66	
Critical Slope	0.006453	ft/ft
Velocity	2.22	ft/s
Velocity Head	0.08	ft
Specific Energy	0.23	ft
Froude Number	1.17	
Maximum Discharge	1.23	cfs
Full Flow Capacity	1.14	cfs
Full Flow Slope	0.000134	ft/ft
Flow is supercritical.		

Section B: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.008900	ft/ft
Diameter	8.00	in
Discharge	0.32	cfs

Results		
Depth	0.24	ft
Flow Area	0.11	ft^2
Wetted Perimeter	0.86	ft
Top Width	0.64	ft
Critical Depth	0.26	ft
Percent Full	36.24	
Critical Slope	0.006565	ft/ft
Velocity	2.80	ft/s
Velocity Head	0.12	ft
Specific Energy	0.36	ft
Froude Number	1.17	
Maximum Discharge	1.23	cfs
Full Flow Capacity	1.14	cfs
Full Flow Slope	0.000701	ft/ft
Flow is supercritical.		

Section C: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.005800	ft/ft
Diameter	8.00	in
Discharge	0.14	cfs

Results		
Depth	0.18	ft
Flow Area	0.07	ft^2
Wetted Perimeter	0.72	ft
Top Width	0.59	ft
Critical Depth	0.17	ft
Percent Full	26.36	
Critical Slope	0.006454	ft/ft
Velocity	1.90	ft/s
Velocity Head	0.06	ft
Specific Energy	0.23	ft
Froude Number	0.95	
Maximum Discharge	0.99	cfs
Full Flow Capacity	0.92	cfs
Full Flow Slope	0.000134	ft/ft
Flow is subcritical.		

Section C: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.005800	ft/ft
Diameter	8.00	in
Discharge	0.32	cfs

Results		
Depth	0.27	ft
Flow Area	0.13	ft^2
Wetted Perimeter	0.92	ft
Top Width	0.66	ft
Critical Depth	0.26	ft
Percent Full	40.69	
Critical Slope	0.006565	ft/ft
Velocity	2.40	ft/s
Velocity Head	0.09	ft
Specific Energy	0.36	ft
Froude Number	0.94	
Maximum Discharge	0.99	cfs
Full Flow Capacity	0.92	cfs
Full Flow Slope	0.000701	ft/ft
Flow is subcritical.		

Section D: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.010400	ft/ft
Diameter	8.00	in
Discharge	0.21	cfs

Results		
Depth	0.19	ft
Flow Area	0.08	ft^2
Wetted Perimeter	0.74	ft
Top Width	0.60	ft
Critical Depth	0.21	ft
Percent Full	27.93	
Critical Slope	0.006430	ft/ft
Velocity	2.63	ft/s
Velocity Head	0.11	ft
Specific Energy	0.29	ft
Froude Number	1.27	
Maximum Discharge	1.33	cfs
Full Flow Capacity	1.23	cfs
Full Flow Slope	0.000302	ft/ft
Flow is supercritical.		

Section D: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.010400	ft/ft
Diameter	8.00	in
Discharge	0.39	cfs

Results		
Depth	0.26	ft
Flow Area	0.12	ft^2
Wetted Perimeter	0.89	ft
Top Width	0.65	ft
Critical Depth	0.29	ft
Percent Full	38.66	
Critical Slope	0.006711	ft/ft
Velocity	3.13	ft/s
Velocity Head	0.15	ft
Specific Energy	0.41	ft
Froude Number	1.26	
Maximum Discharge	1.33	cfs
Full Flow Capacity	1.23	cfs
Full Flow Slope	0.001042	ft/ft
Flow is supercritical.		

Section E: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.031400	ft/ft
Diameter	8.00	in
Discharge	0.32	cfs

Results		
Depth	0.17	ft
Flow Area	0.07	ft^2
Wetted Perimeter	0.72	ft
Top Width	0.59	ft
Critical Depth	0.26	ft
Percent Full	26.13	
Critical Slope	0.006565	ft/ft
Velocity	4.41	ft/s
Velocity Head	0.30	ft
Specific Energy	0.48	ft
Froude Number	2.21	
Maximum Discharge	2.30	cfs
Full Flow Capacity	2.14	cfs
Full Flow Slope	0.000701	ft/ft
Flow is supercritical.		

Section E: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.031400	ft/ft
Diameter	8.00	in
Discharge	0.49	cfs

Results		
Depth	0.22	ft
Flow Area	0.10	ft^2
Wetted Perimeter	0.81	ft
Top Width	0.62	ft
Critical Depth	0.33	ft
Percent Full	32.53	
Critical Slope	0.006979	ft/ft
Velocity	4.97	ft/s
Velocity Head	0.38	ft
Specific Energy	0.60	ft
Froude Number	2.21	
Maximum Discharge	2.30	cfs
Full Flow Capacity	2.14	cfs
Full Flow Slope	0.001644	ft/ft
Flow is supercritical.		

Section F: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.126600	ft/ft
Diameter	8.00	in
Discharge	0.32	cfs

Results		
Depth	0.12	ft
Flow Area	0.04	ft^2
Wetted Perimeter	0.59	ft
Top Width	0.52	ft
Critical Depth	0.26	ft
Percent Full	18.46	
Critical Slope	0.006566	ft/ft
Velocity	7.22	ft/s
Velocity Head	0.81	ft
Specific Energy	0.93	ft
Froude Number	4.35	
Maximum Discharge	4.62	cfs
Full Flow Capacity	4.30	cfs
Full Flow Slope	0.000701	ft/ft
Flow is supercritical.		

Section F: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.126600	ft/ft
Diameter	8.00	in
Discharge	0.50	cfs

Results		
Depth	0.15	ft
Flow Area	0.06	ft^2
Wetted Perimeter	0.67	ft
Top Width	0.56	ft
Critical Depth	0.33	ft
Percent Full	23.03	
Critical Slope	0.007009	ft/ft
Velocity	8.23	ft/s
Velocity Head	1.05	ft
Specific Energy	1.21	ft
Froude Number	4.41	
Maximum Discharge	4.62	cfs
Full Flow Capacity	4.30	cfs
Full Flow Slope	0.001712	ft/ft
Flow is supercritical.		

Section G: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.011000	ft/ft
Diameter	12.00	in
Discharge	2.04	cfs

Results		
Depth	0.53	ft
Flow Area	0.42	ft^2
Wetted Perimeter	1.62	ft
Top Width	1.00	ft
Critical Depth	0.61	ft
Percent Full	52.69	
Critical Slope	0.006916	ft/ft
Velocity	4.86	ft/s
Velocity Head	0.37	ft
Specific Energy	0.89	ft
Froude Number	1.32	
Maximum Discharge	4.02	cfs
Full Flow Capacity	3.74	cfs
Full Flow Slope	0.003279	ft/ft
Flow is supercritical.		

Section G: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-4 Brea Plaza Sewer Study
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.011000	ft/ft
Diameter	12.00	in
Discharge	2.22	cfs

Results		
Depth	0.55	ft
Flow Area	0.45	ft^2
Wetted Perimeter	1.68	ft
Top Width	0.99	ft
Critical Depth	0.64	ft
Percent Full	55.49	
Critical Slope	0.007188	ft/ft
Velocity	4.96	ft/s
Velocity Head	0.38	ft
Specific Energy	0.94	ft
Froude Number	1.30	
Maximum Discharge	4.02	cfs
Full Flow Capacity	3.74	cfs
Full Flow Slope	0.003883	ft/ft
Flow is supercritical.		

APPENDIX B: MONITORED FLOW DATA RESULTS & METHODOLOGY

Site Report 11/06/2020

Confidential Proprietary Information

CA Engineering

2020.10 Imperial MH

MH at ~1647 E. Imperial Hwy
Brea, CA 92821
MH # unknown

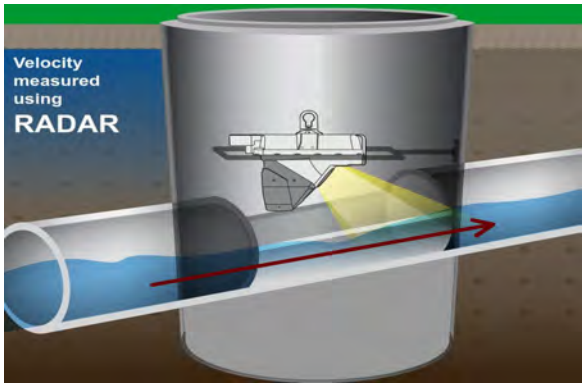
Access:
MH in greenspace between sidewalk & address

System Type:
Sanitary [X] Storm [ ]

Install Date: 10/28/2020

Map

Technology



Traffic Plan

Flow Meter			
Meter Depth: 221"			
MH Coordinates: 33.910942, -117.880687			
Moderate to rapid open channel hydraulics with turbulence due to MH configuration			
Avg Velocity	Avg Measured Level		Multiplier
3.4 fps	3.4"		1.0
Gas			
O2	H2S	CO	LEL
20.9	0	0	0
Notes			
Three inlets from east, north & west; monitored downstream line to get total flow.			
Traffic Safety			
No formal TCP required; used cones & signs per site-specific WATCH Diagram 3			
Land Use			
Residential	Commercial	Industrial	Trunk
	X		

Manhole Depth	243"
Monitored Pipe Size	12"
Inner Pipe Size (In/Out)	12"/12"
Pipe Shape	Round
Pipe Condition	Good
Manhole Material	Concrete
Silt	0"
Velocity Profile Data	*
Velocity Profile Taken	0.4 2-D
Sensor Offset	21.64"
Sensor Dist. to Crown	9.64"
Sensor Direction	Downstream
Flow Heading	South

Meter Site Document

2020.10 Imperial MH

MH at ~1647 E. Imperial Hwy

Brea, CA 92821

Site

Manhole Before Install

Installation Process

Installed

Monitored Pipe Size

Downstream

Temporary Flow Study

CA Engineering

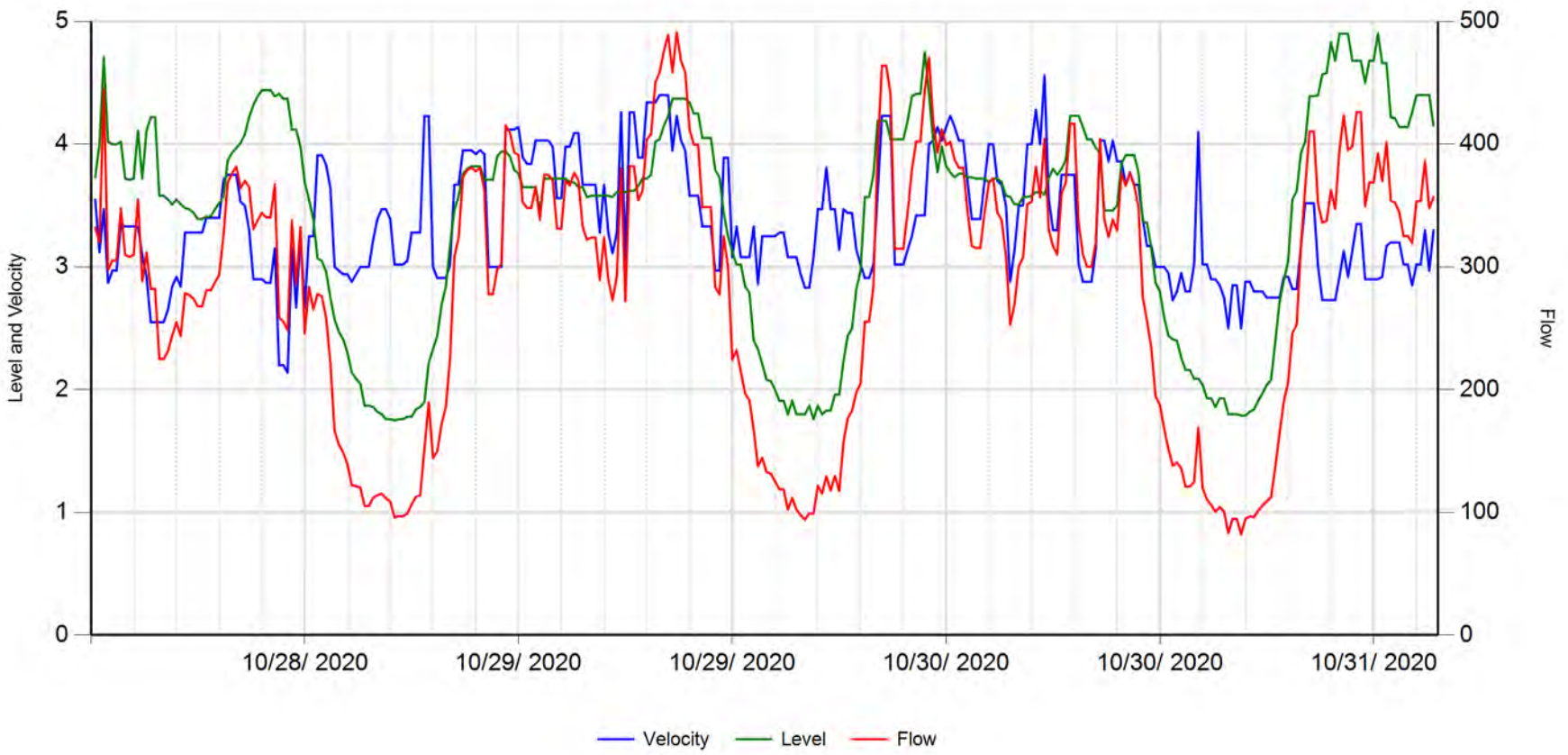
2020.10 Imperial MH

Meter Start Date		From	10/28/2020
Meter Stop Date		To	11/5/2020
Velocity (fps)		Level (in)	Flow (mgd)
Average	3.398	3.406	0.414
Maximum	4.560	5.080	0.707
Minimum	2.140	1.710	0.118
Pipe Size		12.000	
Estimated Capacity (mgd)		Not Calculated	
Capacity Used		Not Calculated	
Sensor Type		Hach - Flodar	

Utility Systems, Science and Software

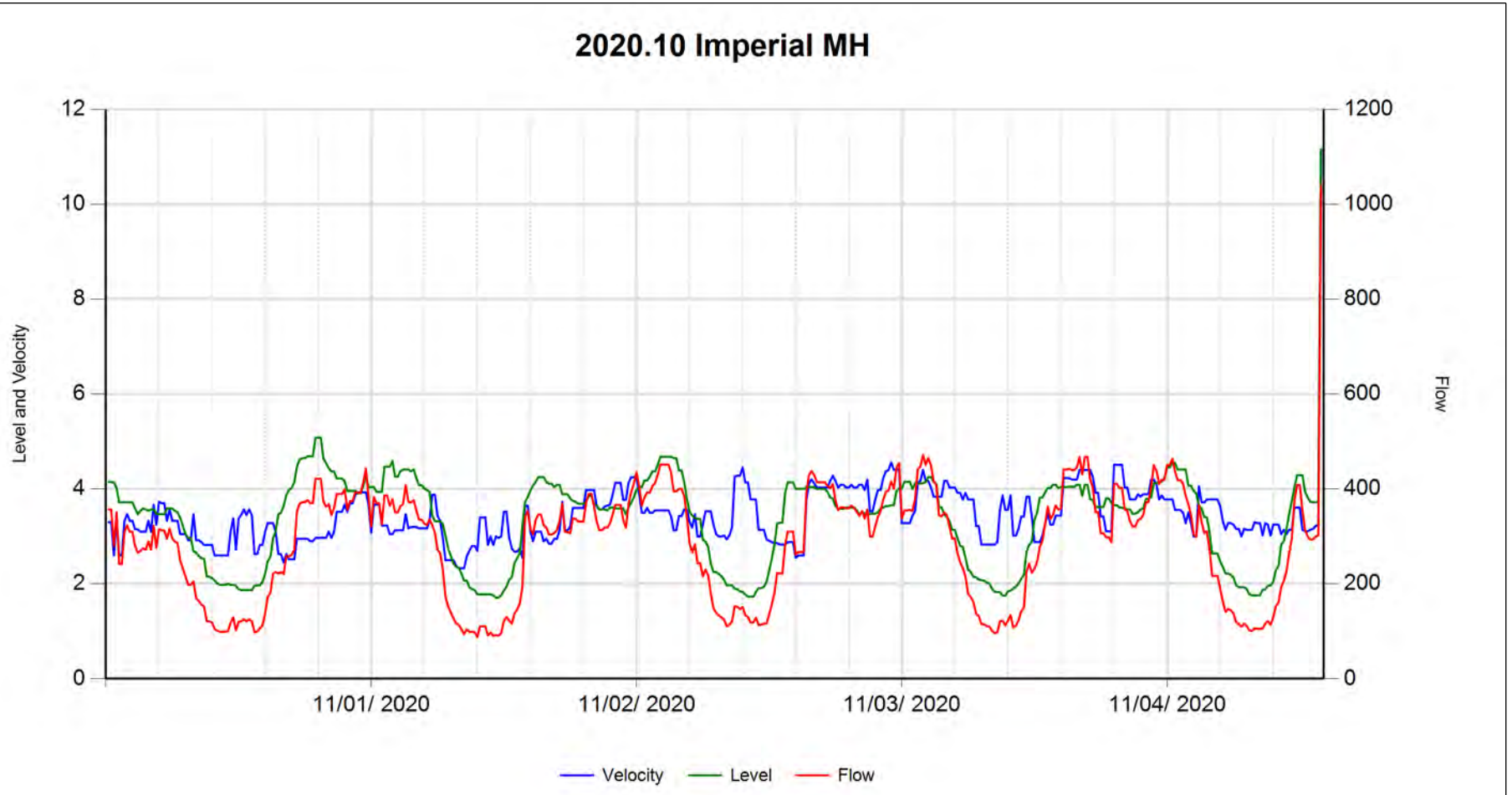
9314 Bond Av, Suite A
El Cajon, CA 92021

601 N. Parkcenter Dr, Suite 209
Santa Ana, CA 92705



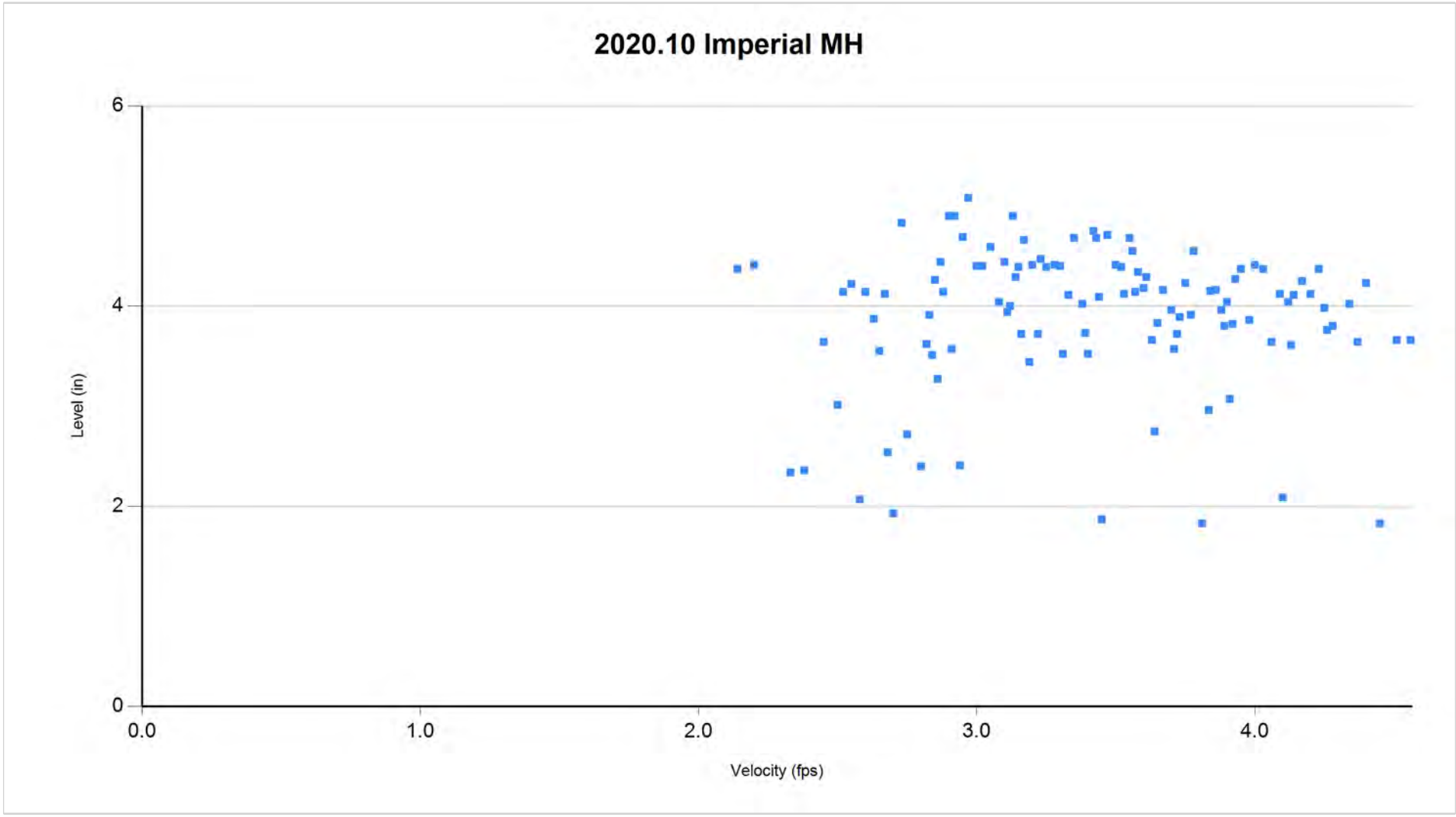
	Velocity (fps)	Level (in)	Flow (gpm)		
Average	3.353	3.405	283.073	**RainFall**	Inches
Maximum	4.560	4.900	491.179		
Minimum	2.140	1.750	82.153		

11/06/2020



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	3.418	3.345	282.490	**RainFall**	Inches
Maximum	4.560	5.080	471.596		
Minimum	2.330	1.710	87.778		

11/06/2020



10/28/2020 thru 11/05/2020

11/6/2020 1:35:54 PM

Methods & Procedures & Equipment

Methods and Procedures

Utility Systems Science & Software provided the CA Engineering Group with an off the shelf, non-proprietary flow monitoring solution that included two state of the art Hach Flo-Dar® AV Sensor systems. The project course of action is listed below. The US^3 team:

- Assessed permitting and traffic control at the sites on E. Imperial Hwy in Brea and in Fullerton, CA.
- Validated the sites for suitability for sewer flow monitoring for the Brea Plaza Project.
- Obtained an Encroachment Permit from the City of Brea.
- Coordinated with the City Inspector for installation and removal of equipment.
- Installed and removed traffic control in accord with approved site-specific Work Area Traffic Control Handbook (WATCH) Diagrams for both the installation and removal of flow monitoring equipment.
- Installed and calibrated the equipment per manufacturer recommendations.
- Removed the equipment, validated the data and prepared the data reports.
    - The data supports the conclusion that there is capacity available in the monitored sewer lines since the depth for the peak flows observed during this study did not exceed the d/D limit of 0.50 at either site at any time.
    - Imperial MH: maximum d/D = ~0.42 and peak flow = ~0.7073 mgd (~1.0944 cfs).
    - Perlin MH: maximum d/D = ~0.41 and peak flow = ~0.7815 mgd (~1.2092 cfs).

Equipment

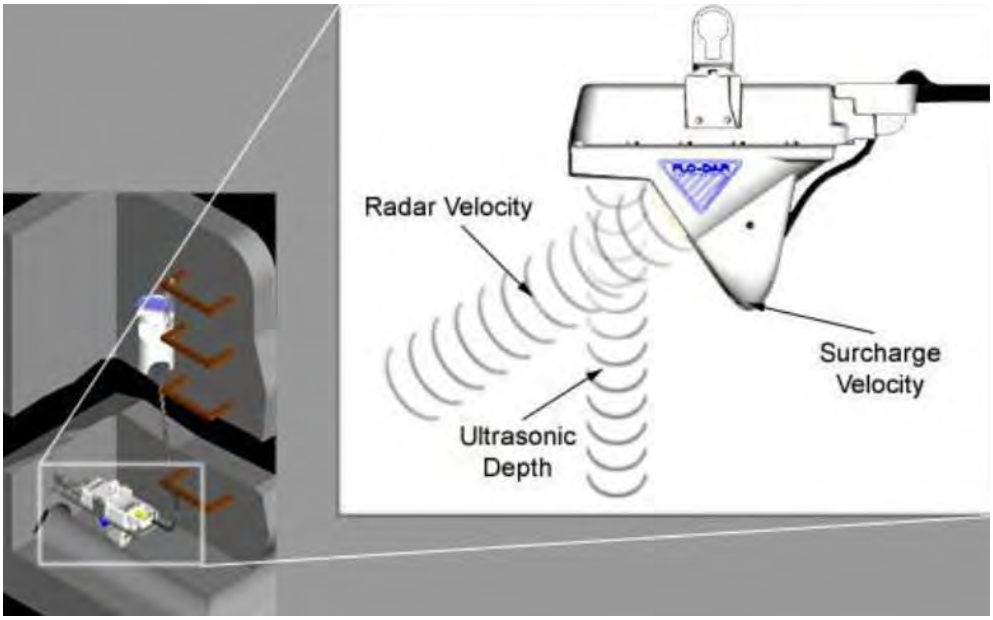


Figure: Equipment installed for the Sewer Flow Monitoring Study

Figure: Web-Enabled Flo-Dar® AV Sensor, Radar-Based Velocity/Area Flow Meter

SPECIFICATIONS

- **Enclosure**
  - IP68 Waterproof rating, Polystyrene
- **Dimensions**
  - 160.5 W x 432.2 L x 297 D mm (6.32 x 16.66 x 11.7 in.),
  - With SVS, D = 387 mm (15.2 in.)
- **Weight**
  - 4.8 kg (10.5 lbs.)
- **Operating Temperature**
  - -10 to 50°C (14 to 122°F)
- **Storage Temperature**
  - -40 to 60°C (-40 to 140°F)
- **Power Requirements**
  - Supplied by FL900 Flow Logger, Flo-Logger, or Flo-Station

- **Interconnecting Cable**
  - Disconnect available at both sensor and logger or Flo-Station
  - Polyurethane, 0.400 (±0.015) in. diameter; IP68
  - Standard length 9 m (30 ft), maximum 305 m (1000 ft)
- **Cables – available in two styles:**
  - connectors at both ends
  - connector from sensor with open leads to desiccant hub, desiccant hub with connector to logger. A potting/sealant kit will be included. This can be used to run the cable through conduit.
- **Certification**
  - Certified to: FCC Part 15.245: FCC ID: VIC-FLODAR24
  - Industry Canada Spec. RSS210. v7: IC No.: 6149A-FLODAR24

SURCHARGE DEPTH MEASUREMENT

  - Auto zero function maintains zero error below 0.5 cm (0.2 in.)
- **Method**
  - Piezo-resistive pressure transducer with stainless steel diaphragm
- **Range**
  - 3.5 m (138 in.), overpressure rating 2.5 x full scale

VELOCITY MEASUREMENT

- **Method**
  - Radar
- **Range**
  - 0.23 to 6.10 m/s (0.75 to 20 ft/s)
- **Frequency Range**
  - 24.075 to 24.175 GHz, 15.2 mW (max.)
- **Accuracy**
  - ±0.5%; ±0.03 m/s (±0.1 ft/s)

DEPTH MEASUREMENT

- **Method**
  - Ultrasonic
- **Standard Operating Range from Flo-Dar® Housing to Liquid**
  - 0 to 152.4 cm (0 to 60 in.)
- **Optional Extended Level Operating Range from Transducer Face to Liquid**
  - 0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) dead band, temperature compensated.
- **Accuracy**
  - ±1%; ±0.25 cm (±0.1 in.)

FLOW MEASUREMENT

- **Method**
  - Based on Continuity Equation
- **Accuracy**
  - ±5% of reading typical where flow is in a channel with uniform flow conditions and is not surcharged, ±1% full scale max.

SURCHARGE CONDITIONS DEPTH/VELOCITY DEPTH (Std with Flo-Dar® Sensor)

- **Surcharge depth supplied by Flo-Dar® sensor.**

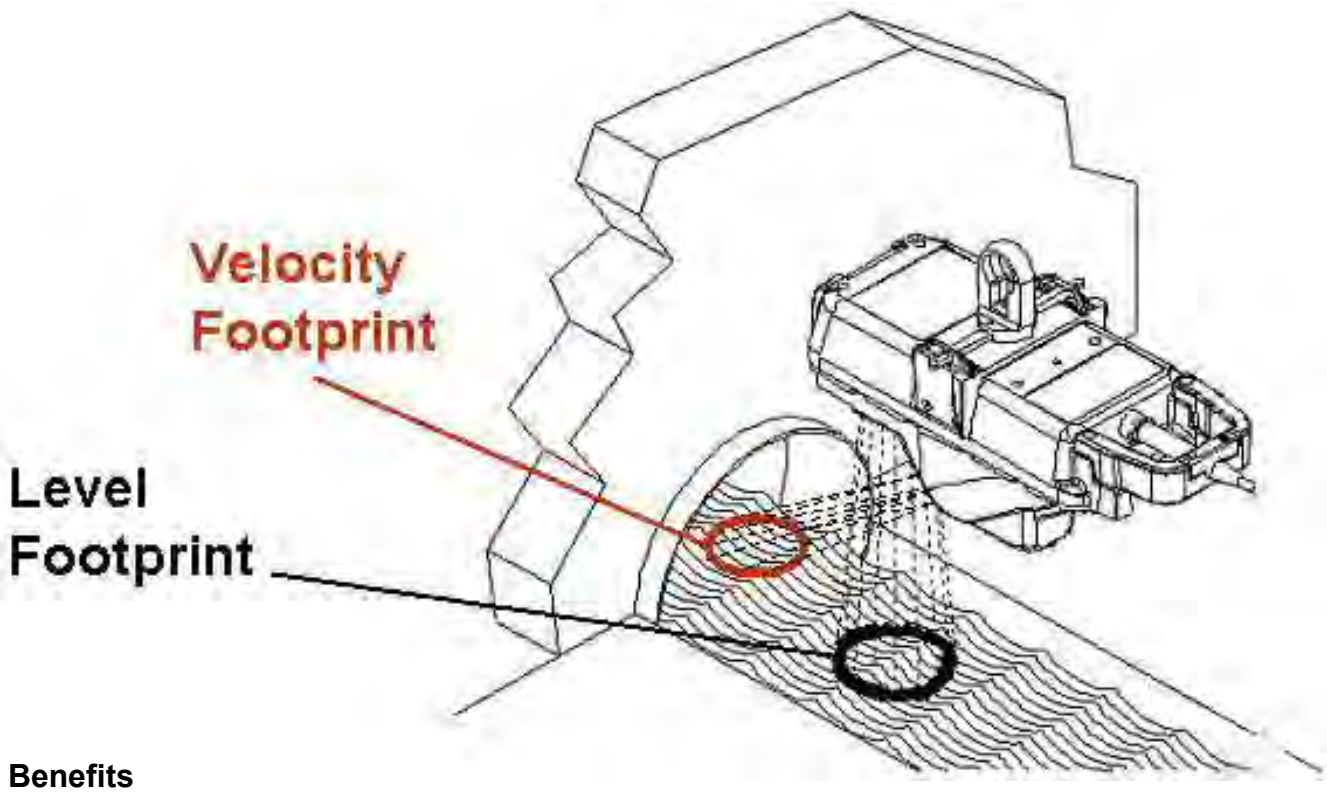
VELOCITY (Optional Surcharge Velocity Sensor)

- **Method**
  - Electromagnetic
- **Range**
  - ±4.8 m/s (±16 ft/s)
- **Accuracy**
  - ±0.15 ft/s or 4% of reading, whichever is greater.
- **Zero Stability**
  - ±0.05 ft/s

The Flo-Dar® Open Channel Flow Meters provide an innovative approach to open channel flow monitoring. Combining digital Doppler radar velocity sensing with ultrasonic pulse echo level sensing Flo-Dar® provides accurate open channel flow monitoring without the fouling problems associated with submerged sensors.

Perfect Solution for Difficult Flow Conditions:

- Flows with High Solids Content
- High Temperature Flows
- Caustic Flows
- Large Man-Made Channel
- High Velocities
- Shallow Flows



Benefits

1. Personnel have no contact with the flow during installation.
2. Maintenance caused by sensor fouling is eliminated
3. Field Replaceable/Interchangeable Sensors and Monitors

How It Works

Flo-Dar® transmits a digital Doppler radar beam that interacts with the fluid and reflects back signals at a different frequency than that which was transmitted. These reflected signals are compared with the transmitted frequency. The resulting frequency shift provides an accurate measure of the velocity and the direction of the flow. Level is detected by ultrasonic pulse echo. Flow is then calculated based on the Continuity Equation:

Q = V x A, Where Q = Flow, V = Average Velocity and A = Area

Accurate Flow Measurements

Flo-Dar® provides the user with highly accurate flow measurements under a wide range of flows and site conditions. By measuring the velocity of the fluid from above, Flo-Dar® eliminates accuracy problems inherent with submerged sensors including sensor disturbances, high solids content and distribution of reflectors.

US³ Company Information

US³ is a California Corporation **Federal ID No. 33-0729605** and qualifies as a Minority Business Enterprise. US³ has certified as an MBE with the California Public Utility Commission's authorized clearinghouse, **Verification Number: 97ES0008.**

US³ is a specialty service company for the Water & Waste Water industry, providing monitoring and control for Utilities since 1996. US³ is in the forefront of this industry by taking the proven technological approaches developed in other high-tech industries and applying them to protect one of our most precious natural resources - our water.

US³ engineers and technical personnel have applied advanced instrumentation system technology to water/wastewater open channel flow monitoring, pipeline evaluation, engineering, and data analysis, all coupled to the power of the Internet. This unique integrated systems approach allows the company to bring greater insight and intelligence to gathering information about water/wastewater system performance of our clients, and in turn, to support the fulfillment of their commitments to manage and cost effectively design, operate, and maintain these systems.

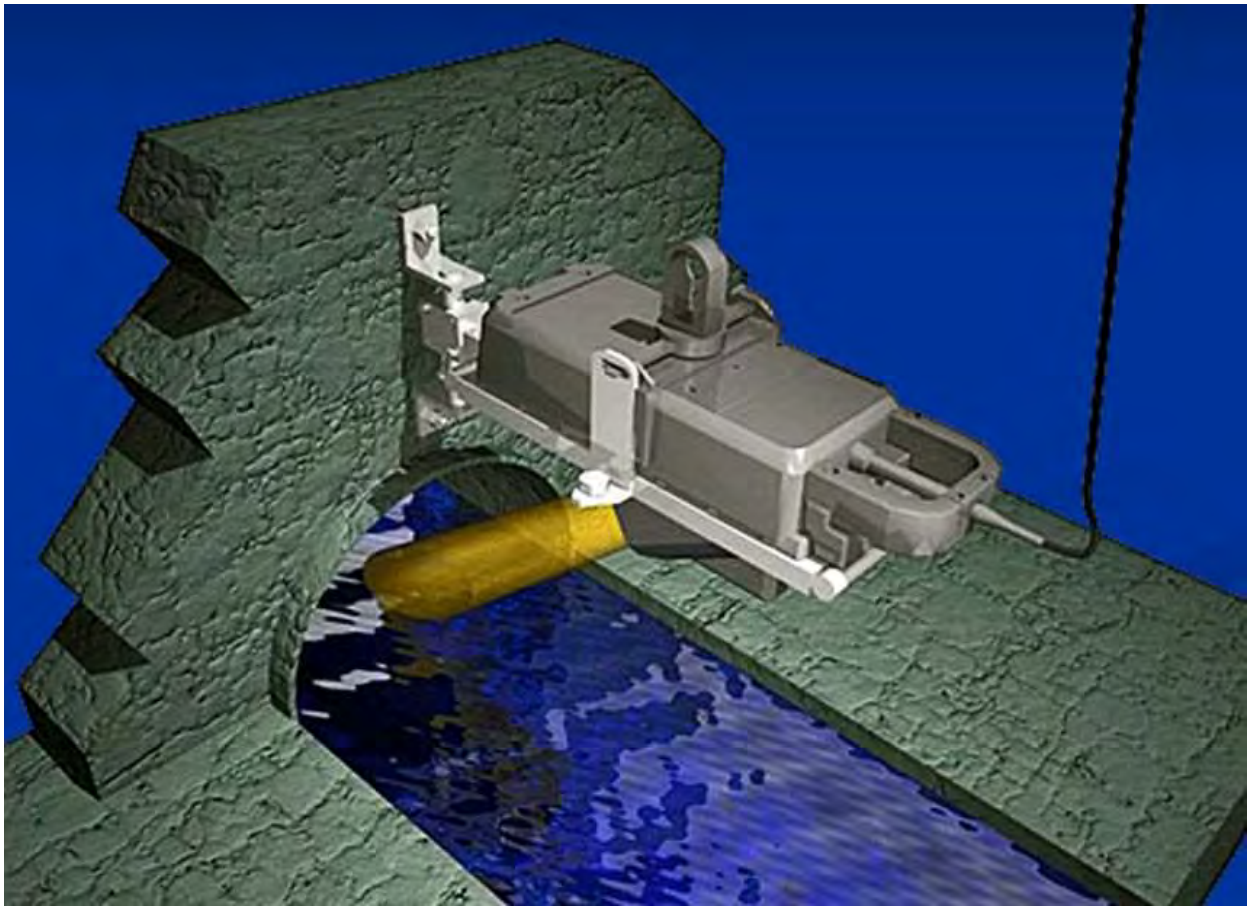


Figure: US³ utilizes exclusively Hach March-McBirney Flo-Dar® Meters

Moreover, ***US³*** supports Municipalities, Consulting Engineering firms and other water/waste water systems integrators by providing temporary technical services for engineering, software programming and technical site maintenance and calibration site support work, primarily in the Water and Waste Water industries.

Figure: All technicians are certified for Confined Space Entry.

Name, Title, Address and Telephone numbers of persons to contact concerning this report.

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FCS
An ADEC Innovation

G.2 - Modified Project Sewer Study

CA ENGINEERING, INC.

Planning • Engineering • Surveying

SEWER STUDY

FOR

Brea Plaza Mixed- Use Apartment Project
1639 E. Imperial Highway
Brea, CA 92821

City of Brea

Preparation Date: January 6th, 2025
Revision Date: February 18th, 2025

REGISTERED PROFESSIONAL ENGINEER
FRED CORNWELL
NO. 45591
CIVIL
STATE OF CALIFORNIA

PLANS PREPARED UNDER THE SUPERVISION OF:

2-18-25

Fred Cornwell, P.E. - R.C.E 45591 **Date**

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Proposed Site

The proposed project consists of redeveloping 1.77 acres of the approximately 15.58 acre existing retail site known as the Brea Plaza. The proposed project will involve the demolition of the Buca Di Beppo building, as well as the asphalt drive aisles/parking areas, concrete walkways, and landscaped planters within the project area. The project will build a 4 story apartment building with total area of 118,620 square feet (sf), on top of a 2 story parking structure with total area of 43,451 sf. The apartments include three different unit types spreading between level 3 through level 6: studio, one bedroom and two bedrooms. The project includes a fitness center, community room and an outdoor terrace located at the 6th level. Other supporting mechanical rooms and electrical rooms spread out in various levels. In addition, a new 5,000 square foot building will be built in the area where the Buca Di Beppo building currently exists. The project will also include asphalt drive aisles, exterior parking, an outside trash enclosure, and accessible walkways.

The existing on-site sewer system will be utilized, and, if necessary, improved to provide adequate conveyance for the increased sewer flow.

Methodology

This sewer report is prepared to quantify the existing and proposed flows tributary to the proposed and existing sewers which will serve the proposed project. The City of Brea design flow criteria from the 2021 Sewer Master Plan will be used to calculate the proposed gallons per day (GPD) that the new development will contribute to the existing sewer system. In addition, the design criteria will also be used to estimate the amount of existing tributary flows that the various upstream residences, schools, offices, etc. are contributing to the downstream sewer connection.

This estimate of existing flows will be compared to actual monitoring data which was conducted on the previously mentioned downstream connection manhole location on Imperial Avenue. Finally, we will analyze the impact that the “calculated” additional flows will have on each section of the sewer system. We will be using the computer program “FlowMaster v5.15” produced by Haestad Methods to perform these calculations.

Existing Flows:

The average dry weather existing sewer flow rates were calculated using the unit flow factors contained in Table ES-1 of the 2021 Sewer Master Plan. Results are summarized below in "Table A" and show that Brea Plaza is currently produces a total of 66,598 Gallons per day (GPD) or 0.067 Million Gallons per day (MGD). All sewer flows from Brea Plaza are directed to the Imperial Avenue Manhole. This manhole also serves as a junction for upstream sewer flows from surrounding tributary areas.

The attached "Exhibit A" uses the City of Brea sewer atlas to give a visual representation of how the surrounding tributary areas were counted, and how they flow downstream to the Imperial Avenue manhole. Per "Table A" below the surrounding tributary areas produce a total average dry weather flow of 492,816 GPD or 0.493 MGD.

In total, the average dry weather (Qadw) existing sewer flow rate is 0.559 MGD or 0.866 cfs. Using the City of Brea Design flow criteria this 0.559 MGD can be converted from average dry weather to peak dry weather (Qpdw) using the formula Qpdw = (1.777)*(Qadw^.92). Similarly, peak dry weather is converted to peak wet weather (Qpww) using the formula Qpww = 1.25*Qpdw. The converted values shown in "Table B" result in a peak dry weather value of 1.041 MGD or 1.611 cfs, and a peak wet weather value of 1.302 MGD or 2.014 cfs.

Table A: Average Dry Weather Existing Flow Rates

(Utilizing the City of Brea's Design Guidelines)

Brea Plaza							
Existing	Land Use	Area/Seats	Unit Flow Factor	GPD	MGD	CFS	Sewer Sections Tributary To
Total Wine/ Other	Major Shopping Center	37,505 SF	73.5 GPD/TSF	2,757	0.003	0.004	A-F
Buca Di Beppo	Restaurant	7,672 SF	1575 GPD/TSF	12,083	0.012	0.019	B-F
Fed-Ex/ Sushi/Other	General Commercial	8,015 SF	73.5 GPD/TSF	589	0.001	0.001	C-F
Creamistry/ Wax	General Commercial	6,781 SF	73.5 GPD/TSF	498	0.000	0.001	C-F
Lucilles Bbq	Restaurant	10,487 SF	1575 GPD/TSF	16,517	0.017	0.026	D-F
Mercury Insurance	Administrative & Professional Office	93,605 SF (2 Stories)	73.5 GPD/TSF	13,760	0.014	0.021	E-F
Grocery/ Market	General Commercial	16,213 SF	73.5 GPD/TSF	1,192	0.001	0.002	E-F
New Retail Space (Previous Project)	General Commercial	15,804 SF	73.5 GPD/TSF	1,162	0.001	0.002	E-F
Tux/ Beauty Shop	General Commercial	3,143 SF	73.5 GPD/TSF	231	0.000	0.000	E-F
Shopping Center	Major Shopping Center	30,141 SF	73.5 GPD/TSF	2,215	0.002	0.003	E-F
Fish Grill/ Panera	Restaurant	9,491 SF	1575 GPD/TSF	14,948	0.015	0.023	E-F
Att/ Chick-Fil-A	General Commercial	8,789 SF	73.5 GPD/TSF	646	0.001	0.001	F
			Brea Plaza Total	**66,598**	**0.067**	**0.103**	

Surrounding Areas						
Existing	Type	Area/DU	Unit Flow Factor	GPD	MGD	CFS
R1	Single Family Residential	323	270 GPD/DU	87,210	0.087	0.135
R2	Multiple Family: Medium Density	1014	248 GPD/DU	251,472	0.251	0.389
R3	Multiple Family: High Density	573	210 GPD/DU	120,330	0.120	0.186
C-P	Administrative & Professional Office	406,726 SF	73.5 GPD/TSF	29,894	0.030	0.046
C-RC	Commercial Recreational	7.726 AC	3.15 GPD/AC	24	0.000	0.000
SCH	Schools	370	10.5 GPD/Student	3,885	0.004	0.006
		Surrounding Areas Total		**492,816**	**0.493**	**0.762**
		Total Existing		**559,414**	**0.559**	**0.866**

Table B: Existing Flow Rate Conversion – Average Dry Weather to Peak Wet Weather

(Utilizing the City of Brea's Design Guidelines)

Calculated Flow Rates		GPD	MGD	CFS
Avg Dry Weather:	Qadw	559,414	0.559	0.866
Peak Dry Weather:	Qpdw (1.777*Qadw^.92)		1.041	1.611
Peak Wet Weather:	Qpww (1.25*Qpdw)		1.302	2.014

Table C: Imperial Avenue Manhole Monitored Flow Rates

Monitored Flow Rates	GPM	GPD	MGD	CFS
Average	283.07	407,621	0.408	0.631
Minimum	82.15	118,296	0.118	0.183
Maximum	491.18	707,299	0.707	1.094

The Imperial Avenue manhole was monitored under dry weather conditions from October 28th to November 5th, 2020. Results from this monitoring are shown in "Appendix B" and are summarized in "Table C" above. An average of 283.07 GPM or 0.408 MGD was monitored; 73% of the "calculated" average dry weather flow rate of 0.559 MGD. This monitored average dry weather flow rate of 283.07 GPM is equivalent to 0.631 cfs. "Table C" also shows the peak dry weather monitored flow rate of 0.707 MGD. Since this monitored peak dry weather flow rate of 0.707 MGD is lower than the "calculated" peak dry weather flow rate of 1.041 MGD; the more conservative "calculated" values will be used to analyze the sewer segments in the subsequent sections of this report.

Proposed Flows:

For the new proposed development, the average dry weather sewer flow rates were calculated using the unit flow factors contained in Table ES-1 of the City of Brea 2021 Sewer Master Plan. Results of the proposed flow rate calculations are summarized in "Table D" below and show that the new proposed development will add 0.0333 MGD to the existing sewer system. However, since the existing Buca Di Beppo is being demolished, the 0.0120 MGD it produces (see table "A") will be deducted for a net total of 0.213 GPD.

Table D: Average Dry Weather Proposed Flow Rates

(Utilizing the City of Brea's Design Guidelines)

Proposed Building Calculations							
Building	Floor/ Level	Type	Area (SF) / DU	Unit Flow Factor	GPD	MGD	CFS
Apartments	1	General Offices	3,627	73.5 GPD/TSF	267	0.0003	0.0004
Apartments	1	Parking	11,942	-	-		-
Apartments	2	Parking	27,882	-	-		-
Apartments	3	High Density Residential	30	210 GPD/DU	6,300	0.0063	0.0097
Apartments	4	High Density Residential	30	210 GPD/DU	6,300	0.0063	0.0097
Apartments	5	High Density Residential	31	210 GPD/DU	6,510	0.0065	0.0101
Apartments	6	High Density Residential	29	210 GPD/DU	6,090	0.0061	0.0094
K	1	Restaurant	5,000	1,575 GPD/TSF	7,875	0.0079	0.0122
				Total Proposed	**33,342**	**0.0333**	**0.0516**
Reduction of Buca Di Beppo Flows Due to Building Removal							
Building	Floor/ Level	ZZ	Area (SF)	Unit Flow Factor	GPD		CFS
K	1	Restaurant	7,672	1,575 GPD/TSF	(12,084)	(0.0120)	(0.0187)
				Net Total	**21,258**	0.0213	0.0329

The "calculated" average dry weather net flow rate of 0.021 MGD for the new development is equivalent to 0.033 cfs. Per "Table E" below, the proposed peak dry weather flow rate is 0.051 MDG or 0.080 cfs, and the proposed peak wet weather flow rate is 0.064 MGD or 0.099 cfs. During the sewer section analysis, these proposed flow rates will be added to the existing flow rates to analyze the impact of the new development on the appropriate sewer sections.

Table E: Proposed Flow Rate Conversion - Average Dry Weather to Peak Wet Weather

(Utilizing the City of Brea's Design Guidelines)

Proposed Flow Rates		GPD	MGD	CFS
Avg Dry Weather:	Total GPD (Qadw)	21,258	0.021	0.033
Peak Dry Weather:	Qpdw (1.777*Qadw^.92)		0.051	0.080
Peak Wet Weather:	Qpww (1.25*Qpdw)		0.064	0.099

As shown in "Exhibit B", the existing sewer lines will be used to convey Brea Plaza flows from the existing and proposed tributary buildings. The flows are directed southerly where they confluence with flows from the surrounding areas (see "Exhibit A") at the Imperial Ave. manhole. Using "FlowMaster v5.15" the sewer sections shown in "Exhibit B" were analyzed to determine adequate capacity. The FlowMaster output calculations can be found in Appendix A.

Per the City of Brea Design Standards found in the 2021 Sewer Master Plan, for existing pipes the depth to pipe diameter ratio (d/D) shall be a maximum of 0.64 for peak dry weather flow rates, and 0.75 for peak wet weather flow rates.

"Table F" located below summarizes the results of the section analysis. Only peak dry weather and peak wet weather conditions were analyzed. Results show that all of the onsite Brea Plaza sewer pipe sections (sections A-F) are adequately sized to convey both the existing and proposed flows for each weather condition.

Section G is the critical section since it must convey all of the onsite flows, as well as the flows from the surrounding areas shown in "Exhibit A." Under peak dry weather conditions the proposed flows cause the d/D ratio to increase from 0.46 to 0.47 as the sewer flow increases from 1.61 cfs to 1.69 cfs. The proposed depth to pipe diameter ratio of 0.47 is well below the design limit of 0.64.

Under peak wet weather conditions the d/D ratio increases from 0.52 to 0.54 as the sewer flow increases from 2.01 cfs to 2.11 cfs. The proposed depth to pipe diameter ratio of 0.54 is well below the design limit of 0.75.

Table F: Sewer Section Flow Table

Average Dry Weather										
SECTION	SIZE (IN)	EX. FLOW (MGD)	EX. FLOW (cfs)	PRO. FLOW (MGD)	PRO. FLOW (cfs)	LENGTH	SLOPE	EX. DEPTH/PIPE DIA. RATIO	PRO. DEPTH/PIPE DIA. RATIO	PRO. VELOCITY (fps)
A	8	0.003	0.004	0.024	0.037	245.8	0.0092	-	-	-
B	8	0.015	0.023	0.036	0.056	68.17	0.0089	-	-	-
C	8	0.016	0.025	0.037	0.058	224.31	0.0058	-	-	-
D	8	0.032	0.050	0.054	0.083	223.59	0.0104	-	-	-
E	8	0.066	0.102	0.087	0.135	185.01	0.0314	-	-	-
F	8	0.067	0.103	0.088	0.136	101.11	0.1266	-	-	-
G	12	0.559	0.866	0.581	0.898	246.98	0.0111	-	-	-

Peak Dry Weather = 1.777* Avg Dry Weather ^ 0.92										
SECTION	SIZE (IN)	EX. FLOW (MGD)	EX. FLOW (cfs)	PRO. FLOW (MGD)	PRO. FLOW (cfs)	LENGTH	SLOPE	EX. DEPTH/PIPE DIA. RATIO	PRO. DEPTH/PIPE DIA. RATIO	PRO. VELOCITY (fps)
A	8	0.008	0.012	0.059	0.092	245.8	0.0092	0.05' / 0.67' = 0.08	0.13' / 0.67' = 0.20	1.98
B	8	0.037	0.057	0.088	0.137	68.17	0.0089	0.10' / 0.67' = 0.15	0.16' / 0.67' = 0.24	2.20
C	8	0.039	0.061	0.091	0.141	224.31	0.0058	0.12' / 0.67' = 0.18	0.18' / 0.67' = 0.27	1.91
D	8	0.076	0.117	0.127	0.197	223.59	0.0104	0.14' / 0.67' = 0.21	0.18' / 0.67' = 0.27	2.59
E	8	0.146	0.225	0.197	0.305	185.01	0.0314	0.15' / 0.67' = 0.23	0.17' / 0.67' = 0.26	4.35
F	8	0.147	0.227	0.198	0.307	101.11	0.1266	0.10' / 0.67' = 0.15	0.12' / 0.67' = 0.18	7.13
G	12	1.041	1.611	1.093	1.691	246.98	0.0111	***0.46' / 1.00' = 0.46***	***0.47' / 1.00' = 0.47***	4.65

Peak Wet Weather = 1.25 * Peak Dry Weather										
SECTION	SIZE (IN)	EX. FLOW (MGD)	EX. FLOW (cfs)	PRO. FLOW (MGD)	PRO. FLOW (cfs)	LENGTH	SLOPE	EX. DEPTH/PIPE DIA. RATIO	PRO. DEPTH/PIPE DIA. RATIO	PRO. VELOCITY (fps)
A	8	0.010	0.015	0.074	0.115	245.8	0.0092	0.05' / 0.67' = 0.08	0.14' / 0.67' = 0.21	2.12
B	8	0.046	0.071	0.110	0.171	68.17	0.0089	0.11' / 0.67' = 0.17	0.17' / 0.67' = 0.26	2.35
C	8	0.049	0.076	0.114	0.176	224.31	0.0058	0.13' / 0.67' = 0.20	0.20' / 0.67' = 0.30	2.03
D	8	0.095	0.147	0.159	0.246	223.59	0.0104	0.16' / 0.67' = 0.24	0.20' / 0.67' = 0.30	2.75
E	8	0.182	0.282	0.246	0.381	185.01	0.0314	0.16' / 0.67' = 0.24	0.19' / 0.67' = 0.29	4.63
F	8	0.184	0.284	0.248	0.384	101.11	0.1266	0.12' / 0.67' = 0.18	0.13' / 0.67' = 0.20	7.62
G	12	1.302	2.014	1.366	2.113	246.98	0.0111	***0.52' / 1.00' = 0.52***	***0.54' / 1.00' = 0.54***	4.92

Conclusion:

As shown in the flow tables, under peak dry weather conditions the proposed flow depth to pipe diameter ratios are well below the 64% limit for the existing 8” and 12” sewer pipes at a maximum ratio of 0.27 and 0.47 respectively.

Similarity, under peak wet weather conditions the proposed flow depth to pipe diameter ratios are well below the 75% limit for the existing 8” and 12” sewer pipes at a maximum ratio of 0.30 and 0.54 respectively.

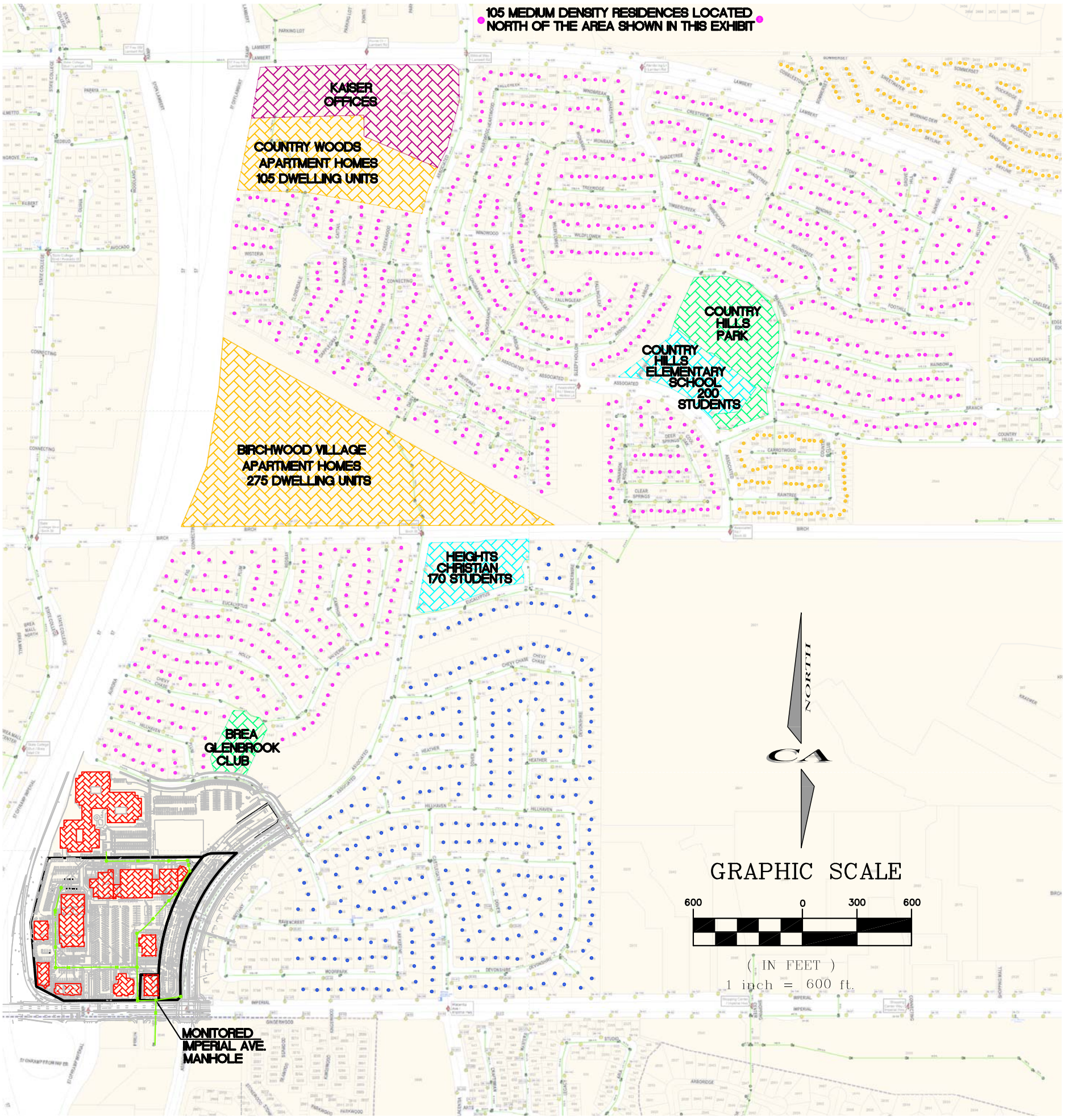
Therefore all existing sewer pipes are currently sized to adequately convey the additional tributary flows from the proposed Brea Plaza development.

EXHIBITS

EXHIBIT A: BREA PLAZA SEWER DESIGN FLOW TRIBUTARY AREA MAP

EXHIBIT "A"

BREA PLAZA SEWER DESIGN FLOW TRIBUTARY AREA MAP

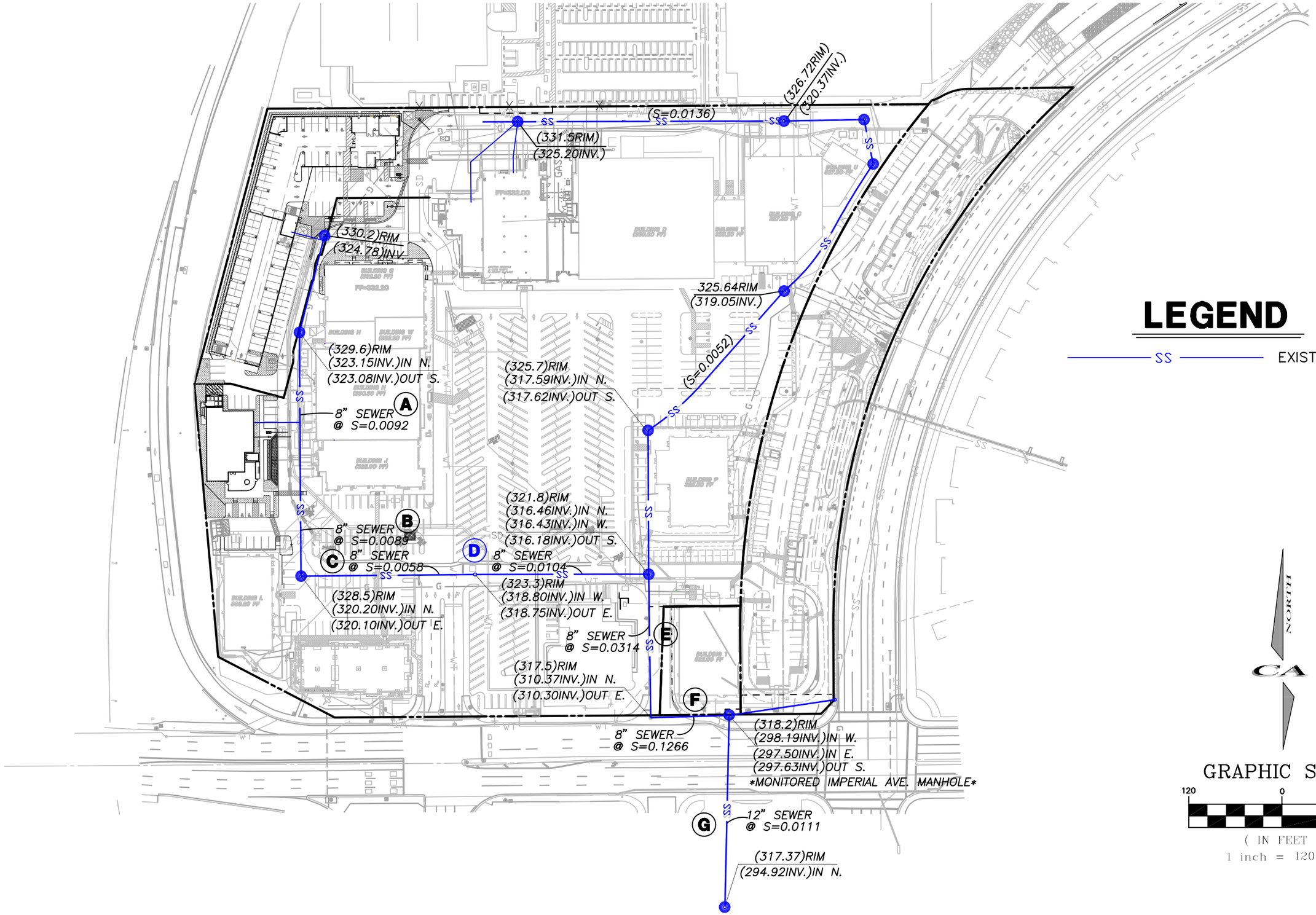


LEGEND

- EXISTING BREA PLAZA BUILDINGS
- COMMERCIAL RECREATIONAL (C–RC)
- SCHOOL (SCH)
- HIGH DENSITY RESIDENTIAL (R3)
- GENERAL OFFICES (CP)
- LOW DENSITY RESIDENTIAL (R1)
- MEDIUM DENSITY RESIDENTIAL (R2)
- HIGH DENSITY RESIDENTIAL (R3)
- PROPOSED/EXISTING SEWER

EXHIBIT B: SEWER SECTION ANALYSIS

EXHIBIT "B": BREA PLAZA SEWER SECTION ANALYSIS



LEGEND

SS — EXISTING SEWER

NORTH

CA

GRAPHIC SCALE

120 0 60 120

(IN FEET)

1 inch = 120 ft.

APPENDICES

APPENDIX A: FLOW MASTER SEWER CALCULATIONS

Section A: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0092	ft/ft
Diameter	8.00	in
Discharge	0.012	cfs

Results		
Depth	0.05	ft
Flow Area	0.01	ft^2
Wetted Perimeter	0.36	ft
Top Width	0.34	ft
Critical Depth	0.05	ft
Percent Full	7.17	
Critical Slope	0.008193	ft/ft
Velocity	1.08	ft/s
Velocity Head	0.02	ft
Specific Energy	0.07	ft
Froude Number	1.06	
Maximum Discharge	1.25	cfs
Full Flow Capacity	1.16	cfs
Full Flow Slope	0.000001	ft/ft
Flow is supercritical.		

Section A: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0092	ft/ft
Diameter	8.00	in
Discharge	0.092	cfs

Results		
Depth	0.13	ft
Flow Area	0.05	ft^2
Wetted Perimeter	0.60	ft
Top Width	0.52	ft
Critical Depth	0.14	ft
Percent Full	19.05	
Critical Slope	0.006584	ft/ft
Velocity	1.98	ft/s
Velocity Head	0.06	ft
Specific Energy	0.19	ft
Froude Number	1.18	
Maximum Discharge	1.25	cfs
Full Flow Capacity	1.16	cfs
Full Flow Slope	0.000058	ft/ft
Flow is supercritical.		

Section B: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0089	ft/ft
Diameter	8.00	in
Discharge	0.057	cfs

Results		
Depth	0.10	ft
Flow Area	0.03	ft^2
Wetted Perimeter	0.53	ft
Top Width	0.48	ft
Critical Depth	0.11	ft
Percent Full	15.21	
Critical Slope	0.006833	ft/ft
Velocity	1.70	ft/s
Velocity Head	0.05	ft
Specific Energy	0.15	ft
Froude Number	1.13	
Maximum Discharge	1.23	cfs
Full Flow Capacity	1.14	cfs
Full Flow Slope	0.000022	ft/ft
Flow is supercritical.		

Section B: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0089	ft/ft
Diameter	8.00	in
Discharge	0.137	cfs

Results		
Depth	0.16	ft
Flow Area	0.06	ft^2
Wetted Perimeter	0.67	ft
Top Width	0.56	ft
Critical Depth	0.17	ft
Percent Full	23.41	
Critical Slope	0.006457	ft/ft
Velocity	2.20	ft/s
Velocity Head	0.08	ft
Specific Energy	0.23	ft
Froude Number	1.17	
Maximum Discharge	1.23	cfs
Full Flow Capacity	1.14	cfs
Full Flow Slope	0.000129	ft/ft
Flow is supercritical.		

Section C: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0058	ft/ft
Diameter	8.00	in
Discharge	0.061	cfs

Results		
Depth	0.12	ft
Flow Area	0.04	ft^2
Wetted Perimeter	0.57	ft
Top Width	0.51	ft
Critical Depth	0.11	ft
Percent Full	17.44	
Critical Slope	0.006793	ft/ft
Velocity	1.49	ft/s
Velocity Head	0.03	ft
Specific Energy	0.15	ft
Froude Number	0.93	
Maximum Discharge	0.99	cfs
Full Flow Capacity	0.92	cfs
Full Flow Slope	0.000025	ft/ft
Flow is subcritical.		

Section C: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0058	ft/ft
Diameter	8.00	in
Discharge	0.141	cfs

Results		
Depth	0.18	ft
Flow Area	0.07	ft^2
Wetted Perimeter	0.72	ft
Top Width	0.59	ft
Critical Depth	0.17	ft
Percent Full	26.46	
Critical Slope	0.006453	ft/ft
Velocity	1.91	ft/s
Velocity Head	0.06	ft
Specific Energy	0.23	ft
Froude Number	0.95	
Maximum Discharge	0.99	cfs
Full Flow Capacity	0.92	cfs
Full Flow Slope	0.000136	ft/ft
Flow is subcritical.		

Section D: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0104	ft/ft
Diameter	8.00	in
Discharge	0.117	cfs

Results		
Depth	0.14	ft
Flow Area	0.05	ft^2
Wetted Perimeter	0.63	ft
Top Width	0.54	ft
Critical Depth	0.16	ft
Percent Full	20.82	
Critical Slope	0.006497	ft/ft
Velocity	2.22	ft/s
Velocity Head	0.08	ft
Specific Energy	0.22	ft
Froude Number	1.26	
Maximum Discharge	1.33	cfs
Full Flow Capacity	1.23	cfs
Full Flow Slope	0.000094	ft/ft
Flow is supercritical.		

Section D: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0104	ft/ft
Diameter	8.00	in
Discharge	0.197	cfs

Results		
Depth	0.18	ft
Flow Area	0.08	ft^2
Wetted Perimeter	0.73	ft
Top Width	0.59	ft
Critical Depth	0.20	ft
Percent Full	27.04	
Critical Slope	0.006425	ft/ft
Velocity	2.59	ft/s
Velocity Head	0.10	ft
Specific Energy	0.28	ft
Froude Number	1.27	
Maximum Discharge	1.33	cfs
Full Flow Capacity	1.23	cfs
Full Flow Slope	0.000266	ft/ft
Flow is supercritical.		

Section E: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0314	ft/ft
Diameter	8.00	in
Discharge	0.225	cfs

Results		
Depth	0.15	ft
Flow Area	0.06	ft^2
Wetted Perimeter	0.65	ft
Top Width	0.55	ft
Critical Depth	0.22	ft
Percent Full	21.89	
Critical Slope	0.006439	ft/ft
Velocity	3.98	ft/s
Velocity Head	0.25	ft
Specific Energy	0.39	ft
Froude Number	2.19	
Maximum Discharge	2.30	cfs
Full Flow Capacity	2.14	cfs
Full Flow Slope	0.000347	ft/ft
Flow is supercritical.		

Section E: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0314	ft/ft
Diameter	8.00	in
Discharge	0.305	cfs

Results		
Depth	0.17	ft
Flow Area	0.07	ft^2
Wetted Perimeter	0.71	ft
Top Width	0.58	ft
Critical Depth	0.26	ft
Percent Full	25.50	
Critical Slope	0.006539	ft/ft
Velocity	4.35	ft/s
Velocity Head	0.29	ft
Specific Energy	0.46	ft
Froude Number	2.21	
Maximum Discharge	2.30	cfs
Full Flow Capacity	2.14	cfs
Full Flow Slope	0.000637	ft/ft
Flow is supercritical.		

Section F: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.1266	ft/ft
Diameter	8.00	in
Discharge	0.227	cfs

Results		
Depth	0.10	ft
Flow Area	0.03	ft^2
Wetted Perimeter	0.54	ft
Top Width	0.48	ft
Critical Depth	0.22	ft
Percent Full	15.61	
Critical Slope	0.006442	ft/ft
Velocity	6.52	ft/s
Velocity Head	0.66	ft
Specific Energy	0.77	ft
Froude Number	4.29	
Maximum Discharge	4.62	cfs
Full Flow Capacity	4.30	cfs
Full Flow Slope	0.000353	ft/ft
Flow is supercritical.		

Section F: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.1266	ft/ft
Diameter	8.00	in
Discharge	0.307	cfs

Results		
Depth	0.12	ft
Flow Area	0.04	ft^2
Wetted Perimeter	0.59	ft
Top Width	0.51	ft
Critical Depth	0.26	ft
Percent Full	18.09	
Critical Slope	0.006543	ft/ft
Velocity	7.13	ft/s
Velocity Head	0.79	ft
Specific Energy	0.91	ft
Froude Number	4.34	
Maximum Discharge	4.62	cfs
Full Flow Capacity	4.30	cfs
Full Flow Slope	0.000645	ft/ft
Flow is supercritical.		

Section G: Peak Dry Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0111	ft/ft
Diameter	12.00	in
Discharge	1.611	cfs

Results		
Depth	0.46	ft
Flow Area	0.35	ft^2
Wetted Perimeter	1.49	ft
Top Width	1.00	ft
Critical Depth	0.54	ft
Percent Full	45.77	
Critical Slope	0.006367	ft/ft
Velocity	4.60	ft/s
Velocity Head	0.33	ft
Specific Energy	0.79	ft
Froude Number	1.37	
Maximum Discharge	4.04	cfs
Full Flow Capacity	3.75	cfs
Full Flow Slope	0.002045	ft/ft
Flow is supercritical.		

Section G: Peak Dry Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0111	ft/ft
Diameter	12.00	in
Discharge	1.691	cfs

Results		
Depth	0.47	ft
Flow Area	0.36	ft^2
Wetted Perimeter	1.51	ft
Top Width	1.00	ft
Critical Depth	0.55	ft
Percent Full	47.06	
Critical Slope	0.006459	ft/ft
Velocity	4.65	ft/s
Velocity Head	0.34	ft
Specific Energy	0.81	ft
Froude Number	1.36	
Maximum Discharge	4.04	cfs
Full Flow Capacity	3.75	cfs
Full Flow Slope	0.002253	ft/ft
Flow is supercritical.		

Section A: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0092	ft/ft
Diameter	8.00	in
Discharge	0.015	cfs

Results		
Depth	0.05	ft
Flow Area	0.01	ft^2
Wetted Perimeter	0.38	ft
Top Width	0.36	ft
Critical Depth	0.05	ft
Percent Full	7.97	
Critical Slope	0.007954	ft/ft
Velocity	1.15	ft/s
Velocity Head	0.02	ft
Specific Energy	0.07	ft
Froude Number	1.07	
Maximum Discharge	1.25	cfs
Full Flow Capacity	1.16	cfs
Full Flow Slope	0.000002	ft/ft
Flow is supercritical.		

Section A: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0092	ft/ft
Diameter	8.00	in
Discharge	0.115	cfs

Results		
Depth	0.14	ft
Flow Area	0.05	ft^2
Wetted Perimeter	0.64	ft
Top Width	0.55	ft
Critical Depth	0.15	ft
Percent Full	21.28	
Critical Slope	0.006503	ft/ft
Velocity	2.12	ft/s
Velocity Head	0.07	ft
Specific Energy	0.21	ft
Froude Number	1.18	
Maximum Discharge	1.25	cfs
Full Flow Capacity	1.16	cfs
Full Flow Slope	0.000091	ft/ft
Flow is supercritical.		

Section B: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0089	ft/ft
Diameter	8.00	in
Discharge	0.071	cfs

Results		
Depth	0.11	ft
Flow Area	0.04	ft^2
Wetted Perimeter	0.57	ft
Top Width	0.50	ft
Critical Depth	0.12	ft
Percent Full	16.92	
Critical Slope	0.006707	ft/ft
Velocity	1.82	ft/s
Velocity Head	0.05	ft
Specific Energy	0.16	ft
Froude Number	1.15	
Maximum Discharge	1.23	cfs
Full Flow Capacity	1.14	cfs
Full Flow Slope	0.000035	ft/ft
Flow is supercritical.		

Section B: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0089	ft/ft
Diameter	8.00	in
Discharge	0.171	cfs

Results		
Depth	0.17	ft
Flow Area	0.07	ft^2
Wetted Perimeter	0.72	ft
Top Width	0.59	ft
Critical Depth	0.19	ft
Percent Full	26.18	
Critical Slope	0.006427	ft/ft
Velocity	2.35	ft/s
Velocity Head	0.09	ft
Specific Energy	0.26	ft
Froude Number	1.17	
Maximum Discharge	1.23	cfs
Full Flow Capacity	1.14	cfs
Full Flow Slope	0.000200	ft/ft
Flow is supercritical.		

Section C: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0058	ft/ft
Diameter	8.00	in
Discharge	0.076	cfs

Results		
Depth	0.13	ft
Flow Area	0.05	ft^2
Wetted Perimeter	0.61	ft
Top Width	0.53	ft
Critical Depth	0.13	ft
Percent Full	19.43	
Critical Slope	0.006673	ft/ft
Velocity	1.59	ft/s
Velocity Head	0.04	ft
Specific Energy	0.17	ft
Froude Number	0.93	
Maximum Discharge	0.99	cfs
Full Flow Capacity	0.92	cfs
Full Flow Slope	0.000040	ft/ft
Flow is subcritical.		

Section C: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0058	ft/ft
Diameter	8.00	in
Discharge	0.176	cfs

Results		
Depth	0.20	ft
Flow Area	0.09	ft^2
Wetted Perimeter	0.77	ft
Top Width	0.61	ft
Critical Depth	0.19	ft
Percent Full	29.64	
Critical Slope	0.006427	ft/ft
Velocity	2.03	ft/s
Velocity Head	0.06	ft
Specific Energy	0.26	ft
Froude Number	0.95	
Maximum Discharge	0.99	cfs
Full Flow Capacity	0.92	cfs
Full Flow Slope	0.000212	ft/ft
Flow is subcritical.		

Section D: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0104	ft/ft
Diameter	8.00	in
Discharge	0.147	cfs

Results		
Depth	0.16	ft
Flow Area	0.06	ft^2
Wetted Perimeter	0.67	ft
Top Width	0.56	ft
Critical Depth	0.18	ft
Percent Full	23.32	
Critical Slope	0.006443	ft/ft
Velocity	2.38	ft/s
Velocity Head	0.09	ft
Specific Energy	0.24	ft
Froude Number	1.26	
Maximum Discharge	1.33	cfs
Full Flow Capacity	1.23	cfs
Full Flow Slope	0.000148	ft/ft
Flow is supercritical.		

Section D: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0104	ft/ft
Diameter	8.00	in
Discharge	0.246	cfs

Results		
Depth	0.20	ft
Flow Area	0.09	ft^2
Wetted Perimeter	0.78	ft
Top Width	0.61	ft
Critical Depth	0.23	ft
Percent Full	30.30	
Critical Slope	0.006458	ft/ft
Velocity	2.75	ft/s
Velocity Head	0.12	ft
Specific Energy	0.32	ft
Froude Number	1.27	
Maximum Discharge	1.33	cfs
Full Flow Capacity	1.23	cfs
Full Flow Slope	0.000414	ft/ft
Flow is supercritical.		

Section E: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0314	ft/ft
Diameter	8.00	in
Discharge	0.282	cfs

Results		
Depth	0.16	ft
Flow Area	0.07	ft^2
Wetted Perimeter	0.69	ft
Top Width	0.57	ft
Critical Depth	0.25	ft
Percent Full	24.51	
Critical Slope	0.006503	ft/ft
Velocity	4.25	ft/s
Velocity Head	0.28	ft
Specific Energy	0.44	ft
Froude Number	2.20	
Maximum Discharge	2.30	cfs
Full Flow Capacity	2.14	cfs
Full Flow Slope	0.000545	ft/ft
Flow is supercritical.		

Section E: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0314	ft/ft
Diameter	8.00	in
Discharge	0.381	cfs

Results		
Depth	0.19	ft
Flow Area	0.08	ft^2
Wetted Perimeter	0.75	ft
Top Width	0.60	ft
Critical Depth	0.29	ft
Percent Full	28.56	
Critical Slope	0.006690	ft/ft
Velocity	4.63	ft/s
Velocity Head	0.33	ft
Specific Energy	0.52	ft
Froude Number	2.21	
Maximum Discharge	2.30	cfs
Full Flow Capacity	2.14	cfs
Full Flow Slope	0.000994	ft/ft
Flow is supercritical.		

Section F: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.1266	ft/ft
Diameter	8.00	in
Discharge	0.284	cfs

Results		
Depth	0.12	ft
Flow Area	0.04	ft^2
Wetted Perimeter	0.57	ft
Top Width	0.51	ft
Critical Depth	0.25	ft
Percent Full	17.41	
Critical Slope	0.006507	ft/ft
Velocity	6.97	ft/s
Velocity Head	0.76	ft
Specific Energy	0.87	ft
Froude Number	4.33	
Maximum Discharge	4.62	cfs
Full Flow Capacity	4.30	cfs
Full Flow Slope	0.000552	ft/ft
Flow is supercritical.		

Section F: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.1266	ft/ft
Diameter	8.00	in
Discharge	0.384	cfs

Results		
Depth	0.13	ft
Flow Area	0.05	ft^2
Wetted Perimeter	0.62	ft
Top Width	0.54	ft
Critical Depth	0.29	ft
Percent Full	20.20	
Critical Slope	0.006698	ft/ft
Velocity	7.62	ft/s
Velocity Head	0.90	ft
Specific Energy	1.04	ft
Froude Number	4.38	
Maximum Discharge	4.62	cfs
Full Flow Capacity	4.30	cfs
Full Flow Slope	0.001010	ft/ft
Flow is supercritical.		

Section G: Peak Wet Weather (Existing)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0111	ft/ft
Diameter	12.00	in
Discharge	2.014	cfs

Results		
Depth	0.52	ft
Flow Area	0.41	ft^2
Wetted Perimeter	1.61	ft
Top Width	1.00	ft
Critical Depth	0.61	ft
Percent Full	52.14	
Critical Slope	0.006879	ft/ft
Velocity	4.86	ft/s
Velocity Head	0.37	ft
Specific Energy	0.89	ft
Froude Number	1.33	
Maximum Discharge	4.04	cfs
Full Flow Capacity	3.75	cfs
Full Flow Slope	0.003196	ft/ft
Flow is supercritical.		

Section G: Peak Wet Weather (Proposed)
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	487-5 Brea Plaza Sewer Study (02 18 24)
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0111	ft/ft
Diameter	12.00	in
Discharge	2.113	cfs

Results		
Depth	0.54	ft
Flow Area	0.43	ft^2
Wetted Perimeter	1.64	ft
Top Width	1.00	ft
Critical Depth	0.62	ft
Percent Full	53.68	
Critical Slope	0.007023	ft/ft
Velocity	4.92	ft/s
Velocity Head	0.38	ft
Specific Energy	0.91	ft
Froude Number	1.32	
Maximum Discharge	4.04	cfs
Full Flow Capacity	3.75	cfs
Full Flow Slope	0.003518	ft/ft
Flow is supercritical.		

APPENDIX B: MONITORED FLOW DATA RESULTS & METHODOLOGY

Site Report 11/06/2020

Confidential Proprietary Information

CA Engineering

2020.10 Imperial MH

MH at ~1647 E. Imperial Hwy
Brea, CA 92821
MH # unknown

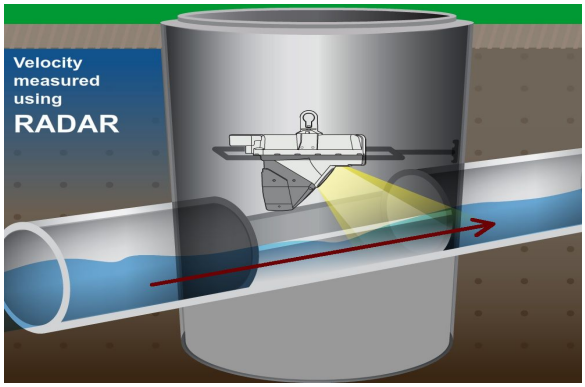
Access:
MH in greenspace between sidewalk & address

System Type:
Sanitary [X] Storm [ ]

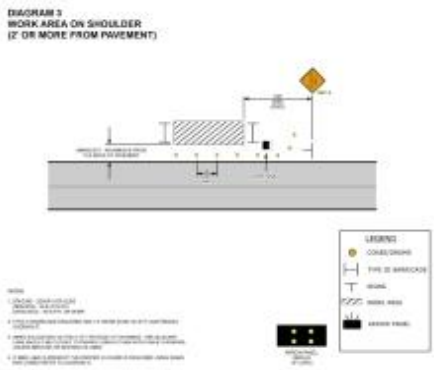
Install Date: 10/28/2020

Map

Technology



Traffic Plan



Flow Meter			
Meter Depth: 221"			
MH Coordinates: 33.910942, -117.880687			
Moderate to rapid open channel hydraulics with turbulence due to MH configuration			
Avg Velocity	Avg Measured Level		Multiplier
3.4 fps	3.4"		1.0
Gas			
O2	H2S	CO	LEL
20.9	0	0	0
Notes			
Three inlets from east, north & west; monitored downstream line to get total flow.			
Traffic Safety			
No formal TCP required; used cones & signs per site-specific WATCH Diagram 3			
Land Use			
Residential	Commercial	Industrial	Trunk
	X		

Manhole Depth	243"
Monitored Pipe Size	12"
Inner Pipe Size (In/Out)	12"/12"
Pipe Shape	Round
Pipe Condition	Good
Manhole Material	Concrete
Silt	0"
Velocity Profile Data	*
Velocity Profile Taken	0.4 2-D
Sensor Offset	21.64"
Sensor Dist. to Crown	9.64"
Sensor Direction	Downstream
Flow Heading	South

Meter Site Document

2020.10 Imperial MH

MH at ~1647 E. Imperial Hwy

Brea, CA 92821

Site

Manhole Before Install

Installation Process

Installed

M□□□□r□d□□□□□□□□

Downstream

Temporary Flow Study

CA Engineering

2020.10 Imperial MH

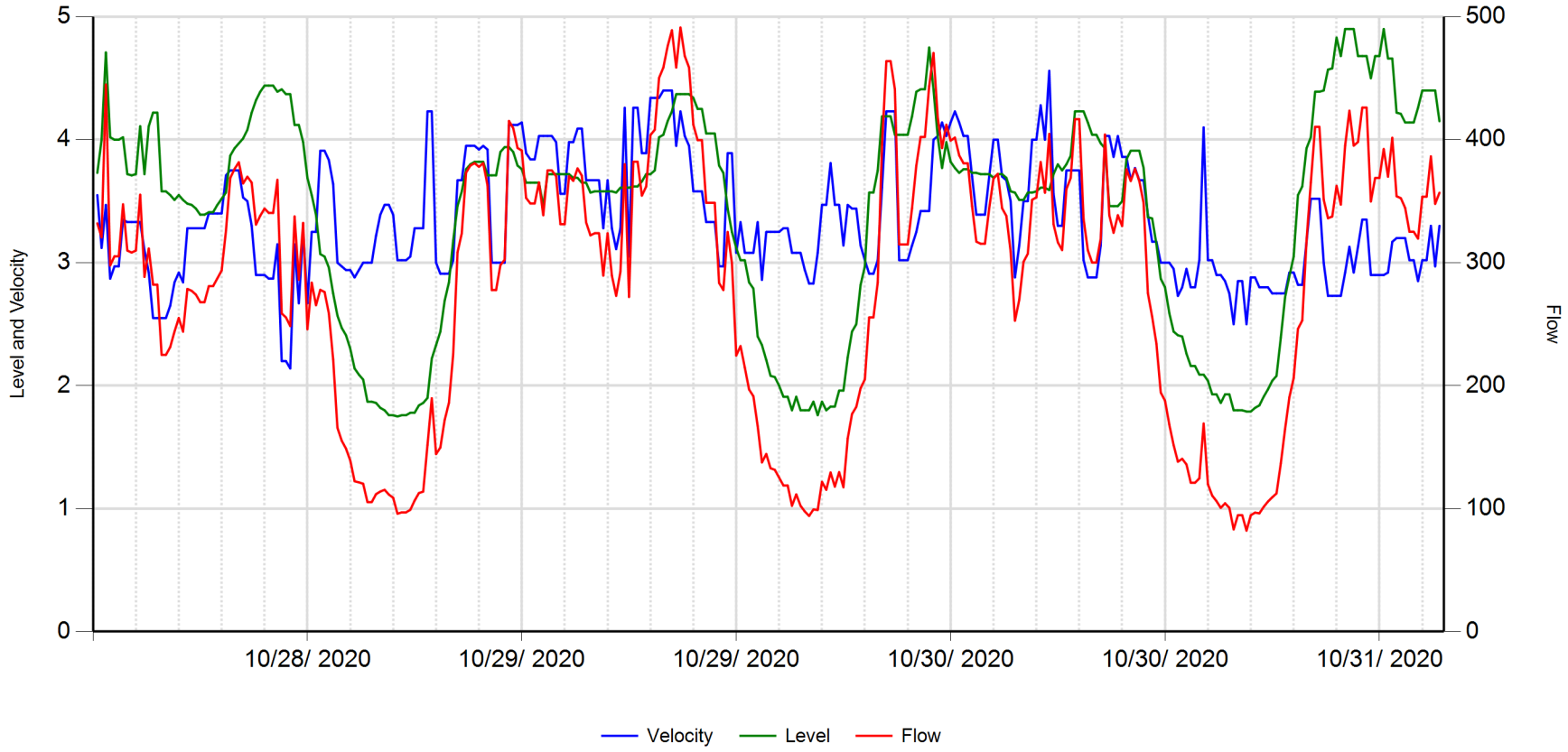
Meter Start Date		From	10/28/2020
Meter Stop Date		To	11/5/2020
Velocity (fps)		Level (in)	Flow (mgd)
Average	3.398	3.406	0.414
Maximum	4.560	5.080	0.707
Minimum	2.140	1.710	0.118
Pipe Size		12.000	
Estimated Capacity (mgd)		Not Calculated	
Capacity Used		Not Calculated	
Sensor Type		Hach - Flodar	

Utility Systems, Science and Software

9314 Bond Av, Suite A
El Cajon, CA 92021

601 N. Parkcenter Dr, Suite 209
Santa Ana, CA 92705

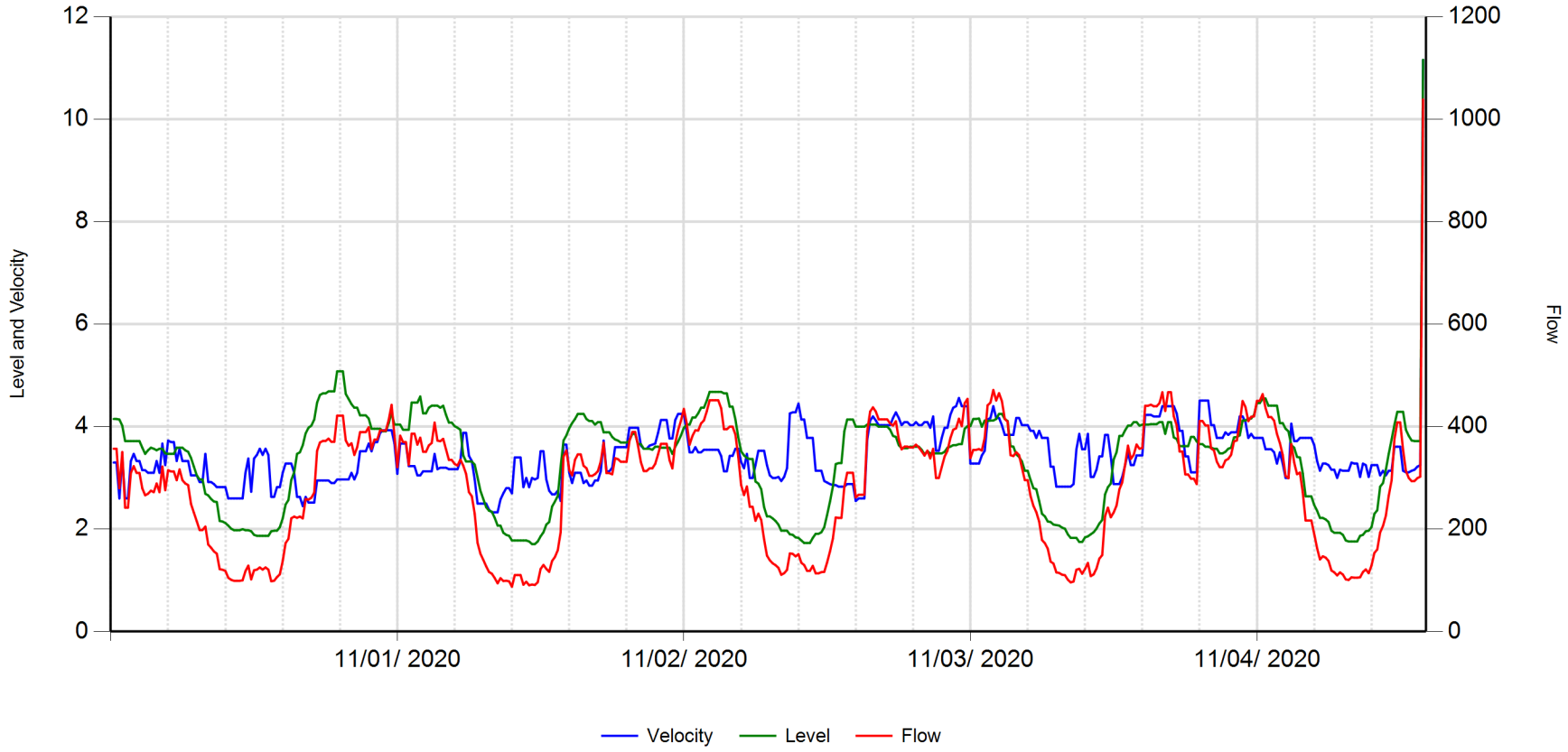
2020.10 Imperial MH



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	3.353	3.405	283.073	**RainFall**	Inches
Maximum	4.560	4.900	491.179		
Minimum	2.140	1.750	82.153		

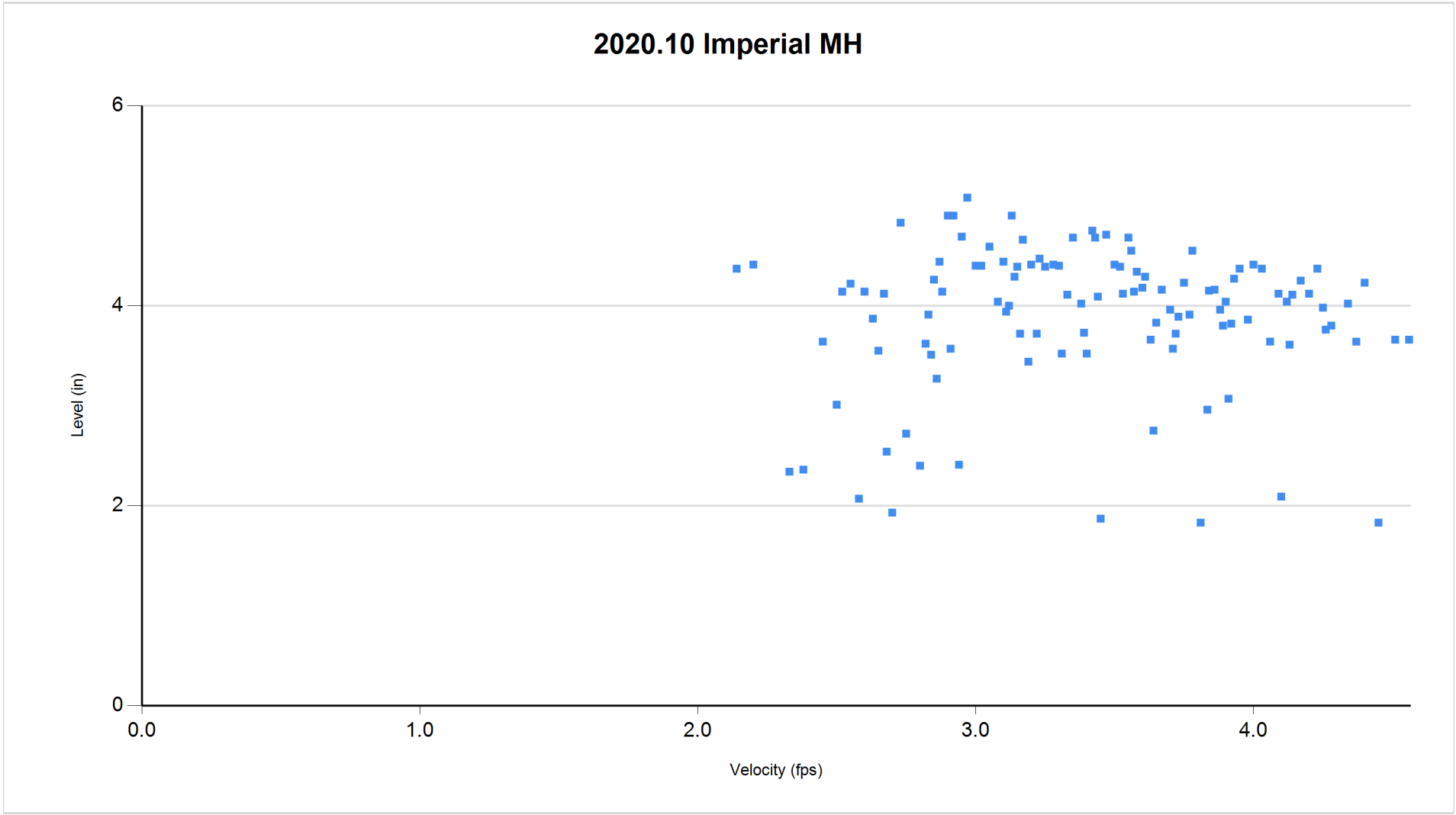
11/06/2020

2020.10 Imperial MH



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	3.418	3.345	282.490	**RainFall**	Inches
Maximum	4.560	5.080	471.596		
Minimum	2.330	1.710	87.778		

11/06/2020



10/28/2020 thru 11/05/2020

11/6/2020 1:35:54 PM

Methods & Procedures & Equipment

Methods and Procedures

Utility Systems Science & Software provided the CA Engineering Group with an off the shelf, non-proprietary flow monitoring solution that included two state of the art Hach Flo-Dar® AV Sensor systems. The project course of action is listed below. The US^3 team:

- Assessed permitting and traffic control at the sites on E. Imperial Hwy in Brea and in Fullerton, CA.
- Validated the sites for suitability for sewer flow monitoring for the Brea Plaza Project.
- Obtained an Encroachment Permit from the City of Brea.
- Coordinated with the City Inspector for installation and removal of equipment.
- Installed and removed traffic control in accord with approved site-specific Work Area Traffic Control Handbook (WATCH) Diagrams for both the installation and removal of flow monitoring equipment.
- Installed and calibrated the equipment per manufacturer recommendations.
- Removed the equipment, validated the data and prepared the data reports.
    - The data supports the conclusion that there is capacity available in the monitored sewer lines since the depth for the peak flows observed during this study did not exceed the d/D limit of 0.50 at either site at any time.
    - Imperial MH: maximum d/D = ~0.42 and peak flow = ~0.7073 mgd (~1.0944 cfs).
    - Perlin MH: maximum d/D = ~0.41 and peak flow = ~0.7815 mgd (~1.2092 cfs).

Equipment

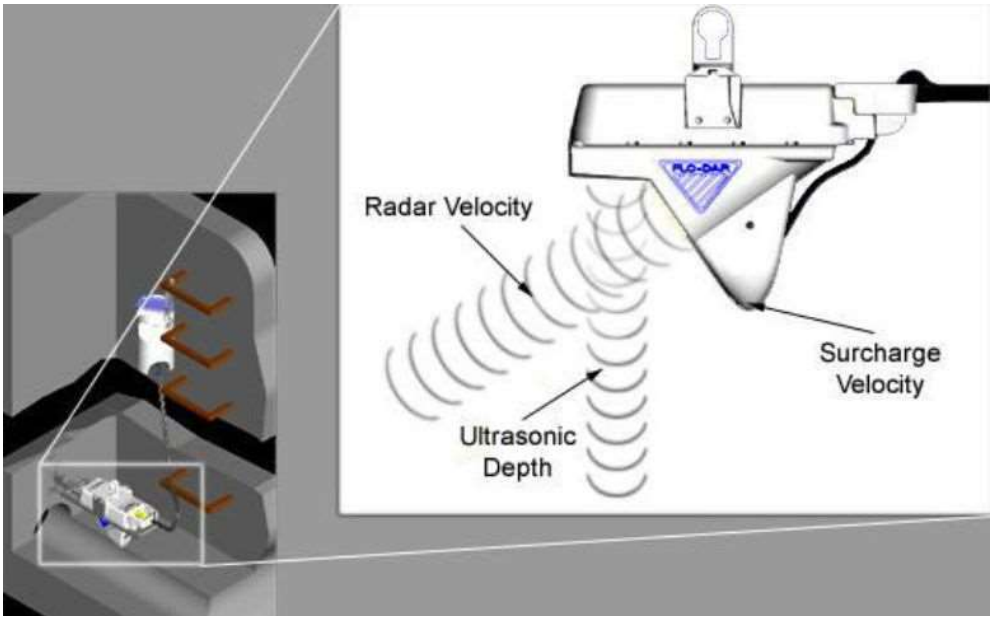


Figure: Equipment installed for the Sewer Flow Monitoring Study

Figure: Web-Enabled Flo-Dar® AV Sensor, Radar-Based Velocity/Area Flow Meter

SPECIFICATIONS

- **Enclosure**
  - IP68 Waterproof rating, Polystyrene
- **Dimensions**
  - 160.5 W x 432.2 L x 297 D mm (6.32 x 16.66 x 11.7 in.),
  - With SVS, D = 387 mm (15.2 in.)
- **Weight**
  - 4.8 kg (10.5 lbs.)
- **Operating Temperature**
  - -10 to 50°C (14 to 122°F)
- **Storage Temperature**
  - -40 to 60°C (-40 to 140°F)
- **Power Requirements**
  - Supplied by FL900 Flow Logger, Flo-Logger, or Flo-Station

- **Interconnecting Cable**
  - Disconnect available at both sensor and logger or Flo-Station
  - Polyurethane, 0.400 (±0.015) in. diameter; IP68
  - Standard length 9 m (30 ft), maximum 305 m (1000 ft)
- **Cables – available in two styles:**
  - connectors at both ends
  - connector from sensor with open leads to desiccant hub, desiccant hub with connector to logger. A potting/sealant kit will be included. This can be used to run the cable through conduit.
- **Certification**
  - Certified to: FCC Part 15.245: FCC ID: VIC-FLODAR24
  - Industry Canada Spec. RSS210. v7: IC No.: 6149A-FLODAR24

SURCHARGE DEPTH MEASUREMENT

  - Auto zero function maintains zero error below 0.5 cm (0.2 in.)
- **Method**
  - Piezo-resistive pressure transducer with stainless steel diaphragm
- **Range**
  - 3.5 m (138 in.), overpressure rating 2.5 x full scale

VELOCITY MEASUREMENT

- **Method**
  - Radar
- **Range**
  - 0.23 to 6.10 m/s (0.75 to 20 ft/s)
- **Frequency Range**
  - 24.075 to 24.175 GHz, 15.2 mW (max.)
- **Accuracy**
  - ±0.5%; ±0.03 m/s (±0.1 ft/s)

DEPTH MEASUREMENT

- **Method**
  - Ultrasonic
- **Standard Operating Range from Flo-Dar® Housing to Liquid**
  - 0 to 152.4 cm (0 to 60 in.)
- **Optional Extended Level Operating Range from Transducer Face to Liquid**
  - 0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) dead band, temperature compensated.
- **Accuracy**
  - ±1%; ±0.25 cm (±0.1 in.)

FLOW MEASUREMENT

- **Method**
  - Based on Continuity Equation
- **Accuracy**
  - ±5% of reading typical where flow is in a channel with uniform flow conditions and is not surcharged, ±1% full scale max.

SURCHARGE CONDITIONS DEPTH/VELOCITY DEPTH (Std with Flo-Dar® Sensor)

- **Surcharge depth supplied by Flo-Dar® sensor.**

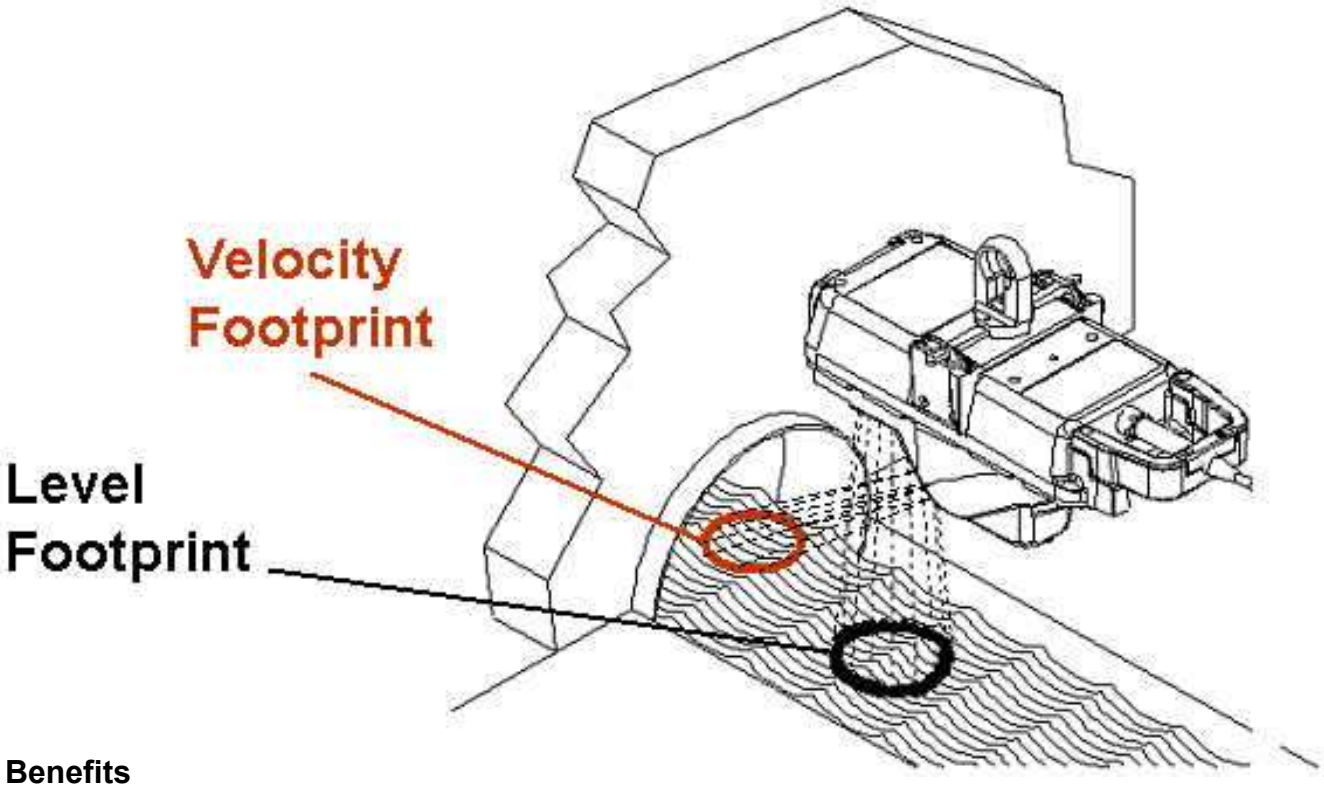
VELOCITY (Optional Surcharge Velocity Sensor)

- **Method**
  - Electromagnetic
- **Range**
  - ±4.8 m/s (±16 ft/s)
- **Accuracy**
  - ±0.15 ft/s or 4% of reading, whichever is greater.
- **Zero Stability**
  - ±0.05 ft/s

The Flo-Dar® Open Channel Flow Meters provide an innovative approach to open channel flow monitoring. Combining digital Doppler radar velocity sensing with ultrasonic pulse echo level sensing Flo-Dar® provides accurate open channel flow monitoring without the fouling problems associated with submerged sensors.

Perfect Solution for Difficult Flow Conditions:

- Flows with High Solids Content
- High Temperature Flows
- Caustic Flows
- Large Man-Made Channel
- High Velocities
- Shallow Flows



Benefits

1. Personnel have no contact with the flow during installation.
2. Maintenance caused by sensor fouling is eliminated
3. Field Replaceable/Interchangeable Sensors and Monitors

How It Works

Flo-Dar® transmits a digital Doppler radar beam that interacts with the fluid and reflects back signals at a different frequency than that which was transmitted. These reflected signals are compared with the transmitted frequency. The resulting frequency shift provides an accurate measure of the velocity and the direction of the flow. Level is detected by ultrasonic pulse echo. Flow is then calculated based on the Continuity Equation:

Q = V x A, Where Q = Flow, V = Average Velocity and A = Area

Accurate Flow Measurements

Flo-Dar® provides the user with highly accurate flow measurements under a wide range of flows and site conditions. By measuring the velocity of the fluid from above, Flo-Dar® eliminates accuracy problems inherent with submerged sensors including sensor disturbances, high solids content and distribution of reflectors.

US³ Company Information

US³ is a California Corporation **Federal ID No. 33-0729605** and qualifies as a Minority Business Enterprise. US³ has certified as an MBE with the California Public Utility Commission's authorized clearinghouse, **Verification Number: 97ES0008.**

US³ is a specialty service company for the Water & Waste Water industry, providing monitoring and control for Utilities since 1996. US³ is in the forefront of this industry by taking the proven technological approaches developed in other high-tech industries and applying them to protect one of our most precious natural resources - our water.

US³ engineers and technical personnel have applied advanced instrumentation system technology to water/wastewater open channel flow monitoring, pipeline evaluation, engineering, and data analysis, all coupled to the power of the Internet. This unique integrated systems approach allows the company to bring greater insight and intelligence to gathering information about water/wastewater system performance of our clients, and in turn, to support the fulfillment of their commitments to manage and cost effectively design, operate, and maintain these systems.

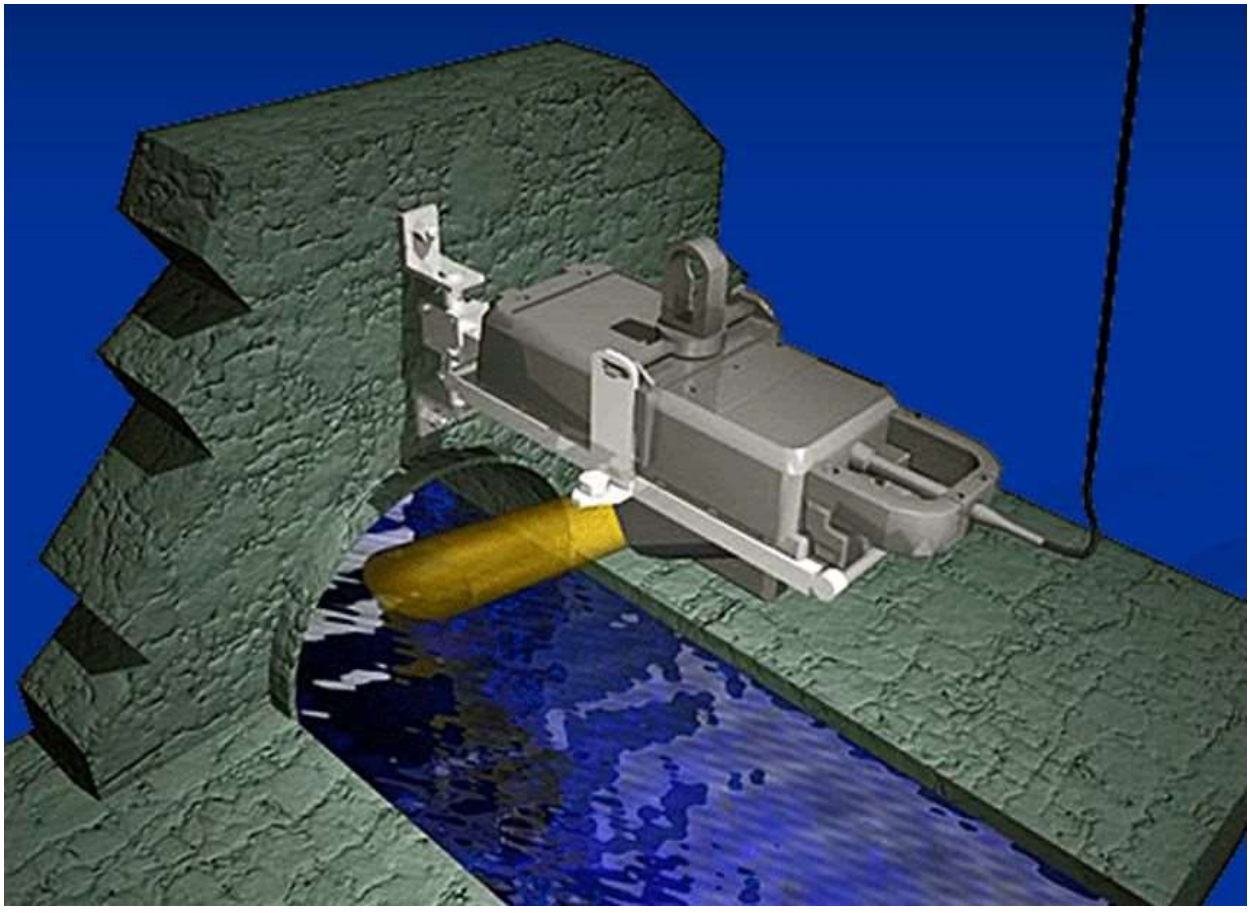


Figure: US³ utilizes exclusively Hach March-McBirney Flo-Dar® Meters

Moreover, ***US³*** supports Municipalities, Consulting Engineering firms and other water/waste water systems integrators by providing temporary technical services for engineering, software programming and technical site maintenance and calibration site support work, primarily in the Water and Waste Water industries.

Figure: All technicians are certified for Confined Space Entry.

Name, Title, Address and Telephone numbers of persons to contact concerning this report.

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Senior Civil Engineer
darlene.szczublewski@uscubed.com

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El Cajon, CA 92021
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619-246-5304 (cell)

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Engineering Manager
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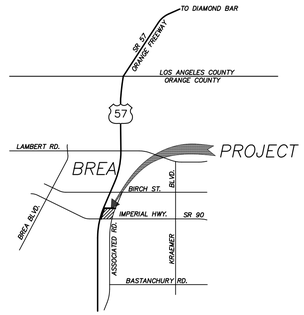
APPENDIX C: CONCEPTUAL GRADING PLAN SET

BREA PLAZA CONCEPTUAL GRADING PLAN #4

1639 E. IMPERIAL HIGHWAY
BREA, CA



VICINITY MAP

N.T.S.

LEGEND AND ABBREVIATIONS

- EXIST. CURB AND GUTTER
- EXIST. STORM DRAIN
- EXIST. CATCH BASIN
- EXIST. SEWER
- EXIST. WATER LINE
- EXIST. STREET LIGHT
- EXIST. FIRE HYDRANT
- EXIST. POWER POLE
- EXIST. SIGN
- PROP. CURB ONLY
- PROP. CURB & GUTTER
- PROP. BUILDING WALL
- PROP. RED CURB
- EXIST. FENCE
- LIMITS OF GRADING
- BOUNDARY
- PRO. LOT LINE
- EX. LOT LINE
- CENTERLINE
- ADA PATH
- (650) EX. CONTOUR
- GAS GAS GAS LINE
- WT WT PRO. WATER LINE
- SS PRO. SEWER LINE
- SD PRO. STORM DRAIN
- PRO. RETAINING WALL

- (624.50) TC — EXISTING ELEVATION
- 2% — RATE/FLOW
- D/W — DRIVEWAY
- TC — TOP OF CURB
- TYP. — TYPICAL
- EVC — END VERTICAL CURVE
- EXIST. — EXISTING
- EX. — EXISTING
- FL — FLOW LINE
- FS — FINISH SURFACE
- FG — FINISH GRADE
- GB — GRADE BREAK
- HP — HIGH POINT
- LP — LOW POINT
- PR./PRO. — PROPOSED
- R/W — RIGHT OF WAY
- PP — PROTECT IN PLACE
- SW — SEWER
- ROOF DRAINS
- X.X% — SURFACE GRADES
- S=X.XXX — DRAINAGE SLOPE/GRADES
- WV — WATER VALVE (WV)
- WM — WATER METER (WM)
- SIGN
- S — SEWER MANHOLE (SS MH)
- FIRE HYDRANT (FH)
- PROPOSED LIGHT POLE (LP)

EARTHWORK ESTIMATE	QUANTITIES CUT	FILL
ROUGH GRADING	1,186	646 CY
OVER-EXCAVATION WORK	11,306 CY	11,306 CY
SUBSIDENCE (0.1')	(283) CY	___CY
SHRINKAGE (9.5%)	(1,186) CY	___CY
SPOILS	___CY	___CY
SUBTOTAL PROJECT EARTHWORK QUANTITIES	11,023 CY	11,952 CY
		929 SHORT

BALANCE ON-SITE WITH SPOILS & CRUSHED A.C. & A.B.

NOTE: EARTHWORK PROVIDED FOR PERMIT COST PURPOSES ONLY. CONTRACTOR IS REQUIRED TO DETERMINE HIS OWN PAY QUANTITIES.

NOTE: SEE CONCEPTUAL UTILITY PLAN FOR SUMMARY OF STORM DRAIN, SEWER, WATER, & OTHER IMPROVEMENTS.

NORTH

CA

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

CERTIFICATION NOTE:

SELF-CERTIFICATIONS FROM A STATE LICENSED PROFESSIONAL ENGINEER OR THIRD-PARTY CERTIFICATIONS ARE REQUIRED OF ALL BMP'S CONSTRUCTED ON THIS PLAN OR FINAL CERTIFICATE OF OCCUPANCY WILL NOT BE GRANTED FROM THE CITY.

C1

FRED CORNWELL R.C.E. 45591

2/20/25
DATE

REGISTERED PROFESSIONAL ENGINEER — FRED CORNWELL — No. 45591 — Exp. 12/31/26 — CIVIL — STATE OF CALIFORNIA

DATE	BY	REVISION

PREPARED BY:

CA ENGINEERING, INC.
Planning • Engineering • Surveying
4101 BIRCH STREET, STE 140
NEWPORT BEACH, CA 92660
949-724-9480 949-724-9484 FAX

PREPARED FOR:

BPI Brea LLC
417 S. Associated Rd, Suite 313
Brea, CA 92821
(248) 792-5071
CONTACT: WAAD J. NADHIR

LAST REV. Feb 20 2025

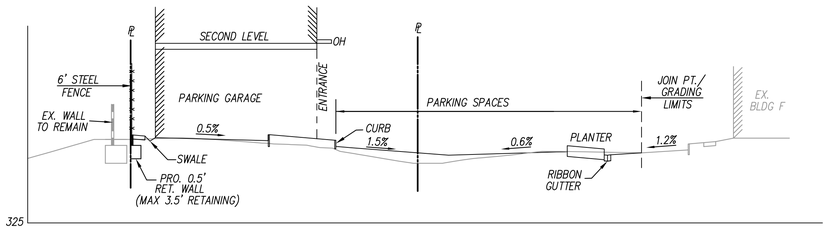
JOB NO. 487-5

Sht. 1 of 2

\\CA-DATA\Shared\487-5 BREA PLAZA APARTMENTS\CON GRADE\487-5 CON GRADE 1.dwg Last Modified: 20 Feb 2025 — 12:12pm
Plotted on: 20 Feb 2025 — 12:42pm by cwolf

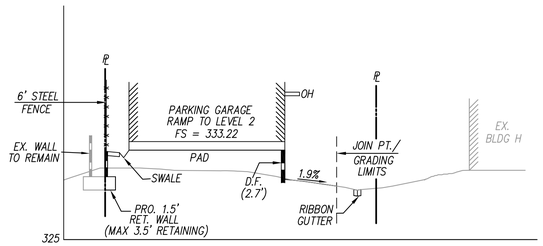
BREA PLAZA CONCEPTUAL GRADING PLAN #4 - SECTIONS

1639 E. IMPERIAL HIGHWAY
BREA, CA



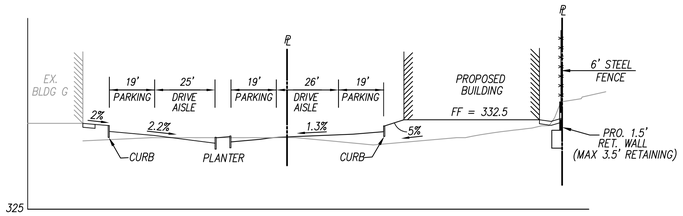
SECTION A-A

SCALE: HOR. 1"=30'; VERT. 1"=6'



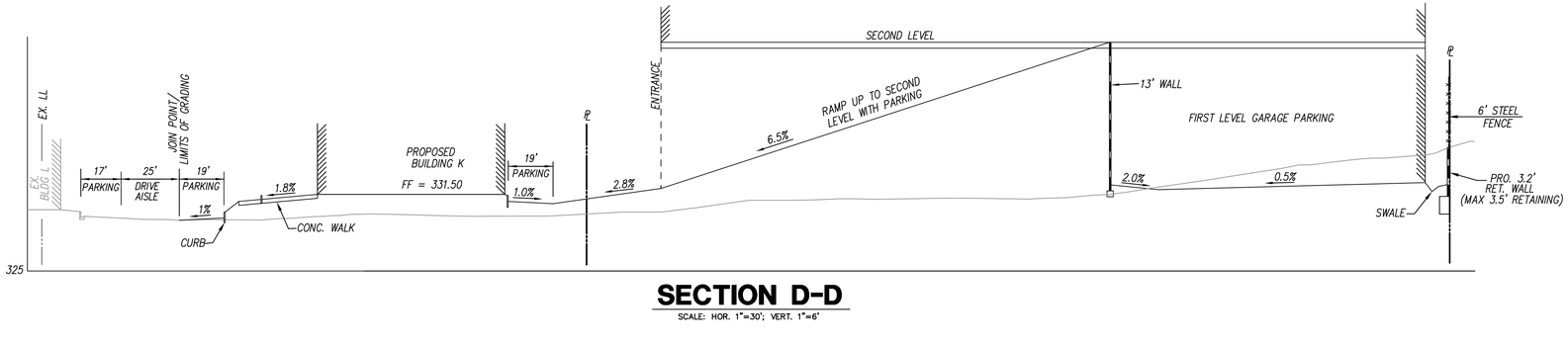
SECTION B-B

SCALE: HOR. 1"=30'; VERT. 1"=6'



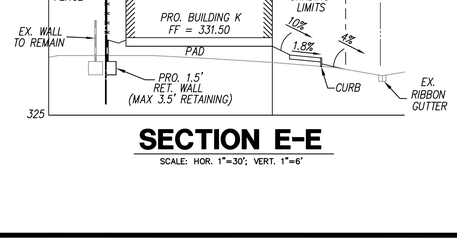
SECTION C-C

SCALE: HOR. 1"=30'; VERT. 1"=6'



SECTION D-D

SCALE: HOR. 1"=30'; VERT. 1"=6'



SECTION E-E

SCALE: HOR. 1"=30'; VERT. 1"=6'

C2

FRED CORNWELL R.C.E. 45591

2/20/25
DATE

REGISTERED PROFESSIONAL ENGINEER — FRED CORNWELL — No. 45591 — Exp. 12/31/26 — CIVIL — STATE OF CALIFORNIA

DATE	BY	REVISION

PREPARED BY:

CA ENGINEERING, INC.

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CONTACT: WAAD J. NADHIR

LAST REV. Feb 20 2025

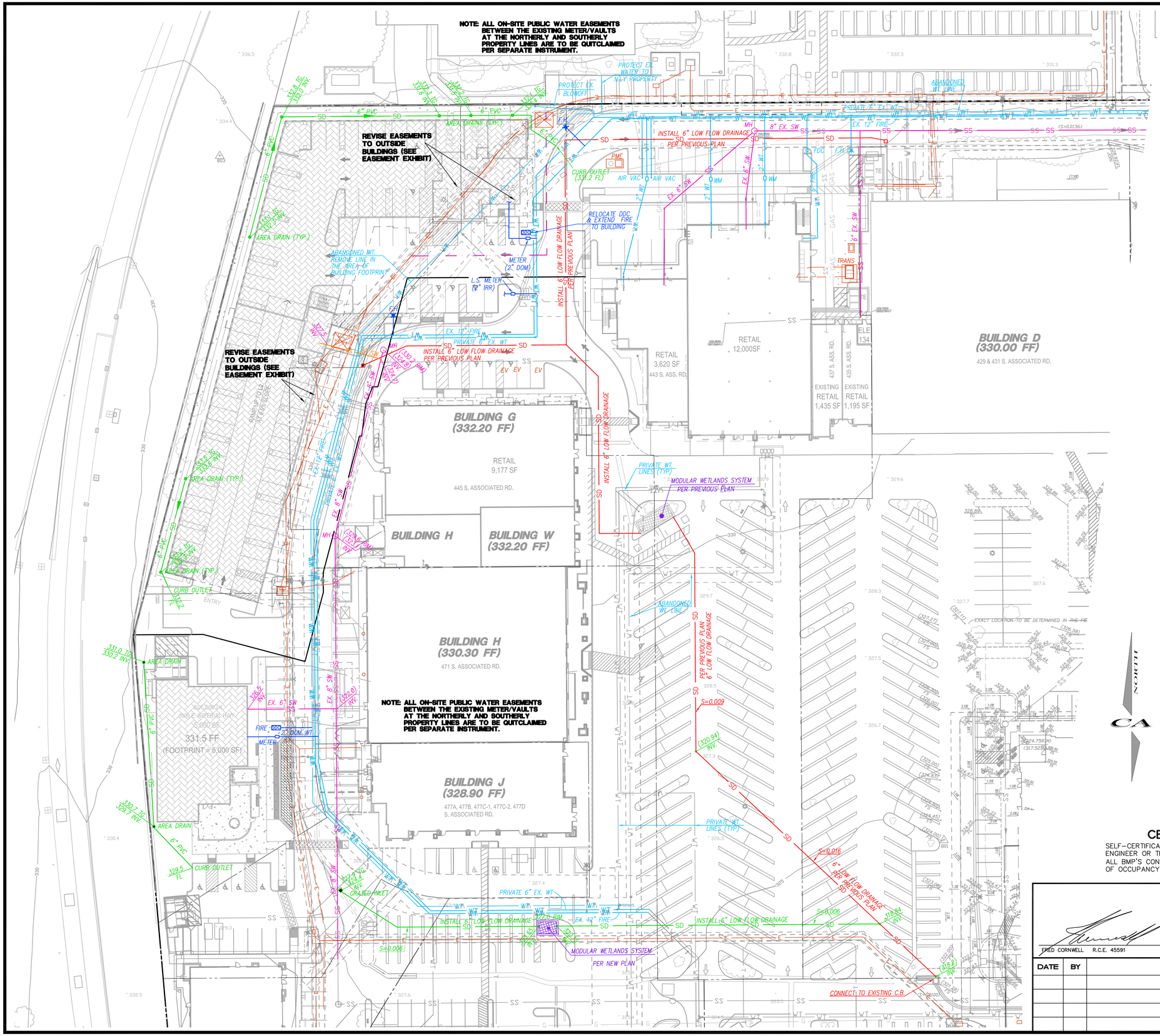
JOB NO. 487-5

Sht. 2 of 2

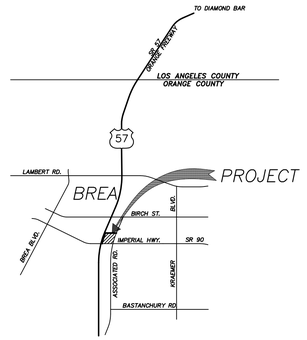
\\CA-SHR1\Shared\487-5 BREA PLAZA APARTMENTS\CON GRADE\487-5 CON GRADE 1.dwg Last Modified: 20 Feb 2025 - 12:12pm
Plotted on: 20 Feb 2025 - 12:40pm by waadj

BREA PLAZA CONCEPTUAL UTILITY PLAN #2

1639 E. IMPERIAL HIGHWAY
BREA, CA



VICINITY MAP



N.T.S.

LEGEND AND ABBREVIATIONS

- EXIST. CURB AND GUTTER
- EXIST. CATCH BASIN
- EXIST. SEWER
- EXIST. WATER LINE
- EXIST. STREET LIGHT
- EXIST. FIRE HYDRANT
- EXIST. POWER POLE
- EXIST. SIGN
- PROP. CURB ONLY
- PROP. CURB & GUTTER
- PROPOSED BUILDING WALL
- PROPOSED SIDEWALK
- EXIST. FENCE
- PRO. FIRE HYDRANT
- PRO. RETAINING WALL

(624.50) TC — EXISTING ELEVATION
2% — RATE/FLOW
D/W — DRIVEWAY
TC — TOP OF CURB
FH — FIRE HYDRANT
TYP. — TYPICAL
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EXIST. — EXISTING
EX. — EXISTING
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GB — GRADE BREAK
HP — HIGH POINT
LP — LOW POINT
PR./PRO. — PROPOSED
R/W — RIGHT OF WAY
PP — PROTECT IN PLACE
SW — SEWER

- CENTERLINE
- (650) EX. CONTOUR
- BOUNDARY LINE
- PROP. LOT LINE

- SD — PROPOSED STORM DRAIN
- SD — EXISTING STORM DRAIN
- SS — PROPOSED SEWER
- SS — EXISTING SEWER
- WT — PROPOSED WATER
- WT — EXISTING WATER
- EXISTING ELECTRIC
- PROPOSED ELECTRIC
- EXISTING TELEPHONE
- PROPOSED MODULAR WETLANDS

NOTE: UTILITIES ARE PROVIDED FOR REFERENCE ONLY AND SEPARATE PERMITS MAY BE REQUIRED.

NOTE: SEE CONCEPTUAL GRADING PLAN FOR DRAINAGE IMPROVEMENTS.

NORTH

CA

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

CERTIFICATION NOTE:

SELF-CERTIFICATIONS FROM A STATE LICENSED PROFESSIONAL ENGINEER OR THIRD-PARTY CERTIFICATIONS ARE REQUIRED OF ALL BMP'S CONSTRUCTED ON THIS PLAN OR FINAL CERTIFICATE OF OCCUPANCY WILL NOT BE GRANTED FROM THE CITY.

C3

FRED CORNWELL R.C.E. 45591

2/20/25
DATE

REGISTERED PROFESSIONAL ENGINEER — FRED CORNWELL — No. 45591 — Exp. 12/31/26 — CIVIL — STATE OF CALIFORNIA

DATE	BY	REVISION

PREPARED BY:

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LAST REV. Feb 20 2025
JOB NO. 487-5
Sht. 1 of 1

\\CA-SVR1\Shared\487-5 BREA PLAZA APARTMENTS\CON GRADE\487-5 CON UTILITY Lang Last Modified: 20 Feb 2025 - 12:12pm
Plotted on: 20 Feb 2025 - 12:43pm by rward

EASEMENT EXHIBIT

NOTE: ALL ON-SITE PUBLIC WATER EASEMENTS BETWEEN THE EXISTING METER/VAULTS AT THE NORTHERLY AND SOUTHERLY PROPERTY LINES ARE TO BE QUITCLAIMED PER SEPARATE INSTRUMENT.

BUILDING E

PARCEL 12

BUILDING F
3,937 SQ FT

15,050 SQ FT

PARCEL 10

BUILDING D
27,159 SQ FT

BUILDING V
3,202 SQ FT

BUILDING C
13,007 SQ FT

BUILDING U
3,023 SQ FT

NEW ACCESS EASEMENT

NEW SCE EASEMENT

BUILDING G
8,893 SQ FT

PARCEL 9

BUILDING H
2,123 SQ FT

BUILDING W
2,460 SQ FT

P.M.B. 105 / 17-19

BUILDING H
15,877 SQ FT

NOTE: ALL ON-SITE PUBLIC WATER EASEMENTS BETWEEN THE EXISTING METER/VAULTS AT THE NORTHERLY AND SOUTHERLY PROPERTY LINES ARE TO BE QUITCLAIMED PER SEPARATE INSTRUMENT.

PARCEL 8

BUILDING K
5,000 SQ FT

PARCEL 7

BUILDING J
7,493 SQ FT

P.M.B. 105 / 17-19

P.M.B. 105 / 17-19

PARCEL 13

PARCEL 11

P.M.B. 105 / 17-19

BUILDING P
9,491 SQ FT

PARCEL 1

LEGEND

- EXISTING PARCEL LINES
- PROPOSED PARCEL LINES
- BOUNDARY
- PRO. CURB
- EX. CURB & STRIPING
- PROPOSED ACCESS EASEMENT
- PRO. SCE EASEMENT
- EX. DRAINAGE EASEMENT
- EX. WATER EASEMENT
- EX. SCE EASEMENT
- EX. PUBLIC EASEMENT

(APPURTENANCES, WIDE PRIVATE DRIVEWAY, ACCESS AND PUBLIC SERVICE AND INCIDENTAL PURPOSES, ETC.)

- PROPOSED BUILDING
- QUITCLAIMED SCE EASEMENT PORTION (PER SEPARATE INSTRUMENT)
- QUITCLAIMED PUBLIC EASEMENT PORTION (PER SEPARATE INSTRUMENT)
- QUITCLAIMED WATER EASEMENT PORTION

NOTE: ALL ONSITE WATER EASEMENT TO BE QUITCLAIMED PER SEPARATE INSTRUMENT

NORTH

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

C4

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PROPERTY ADDRESS:
1639 E. IMPERIAL HIGHWAY
CITY OF BREA, CA

PREPARED FOR:
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CONTACT: WAAD J. NADHIR

LAST REV. Feb 20 2025

JOB NO. 487-5

Sht. 1 of 1