Public Review Draft

PERRY STREET SPECIFIC PLAN

21611 SOUTH PERRY STREET, CARSON, CA 90745

Prepared for
City of Carson

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RAND | PASTER | NELSON

EXHIBIT NO. 3

1. INTRODUCTION

1.1 WHAT IS A SPECIFIC PLAN?

A Specific Plan is a regulatory tool that local governments use to guide development in a focused area of the community. While the General Plan is the primary guide for growth and development citywide, a Specific Plan can focus on the unique characteristics of a special area by customizing the planning process and land use regulations to that area.

California Government Code, Title 7, Division 1, Chapter 3, Article 8, Sections 65450 through 65457, allows cities and counties to prepare Specific Plans to develop policies, programs, regulations, and guidelines to implement the jurisdiction's adopted General Plan.

As prescribed by law, a Specific Plan includes text and diagrams that generally describe the following:

- The distribution, location, and extent of all land uses.
- The standards and criteria by which new development will proceed.
- The proposed distribution, location, extent, and intensity of major components of public infrastructure, such as transportation and utility systems.
- A program of implementation measures, such as financing measures, policies, regulations, and public works projects.

The Perry Street Specific Plan ("PSSP") will be adopted by ordinance and establish the necessary plans, development standards, regulations, infrastructure requirements, and implementation programs on which subsequent project-related development activities within the Plan area are to be founded.

1.2 PURPOSE AND AUTHORITY OF THE SPECIFIC PLAN

The PSSP provides applicants, City staff, the public, and City decision makers with the information on the project and how the PSSP area is consistent with the City of Carson General Municipal Code. The PSSP is a regulatory document prepared pursuant to the provisions of California Government Code sections 65450 through 65457. It is intended that local public works projects, design review plans, site plans, permits, or any other action requiring ministerial or discretionary approval applicable to this area be consistent with the PSSP.

1.3 RELATIONSHIP TO OTHER LAND USE REGULATIONS

The City of Carson General Plan establishes the overall vision for growth and development in the community. The General Plan Land Use Element establishes clear and logical patterns of land use and standards for new development. A key feature of the Land Use Element is the Land Use Policy Map, which shows the location, density, and intensity of development for all land uses citywide. The Land Use Map and the General Plan goals and policies guide future growth and development in Carson.

State law requires that any Specific Plan be consistent with the City's General Plan. The Carson General Plan Land Use Element is being amended concurrent with adoption of the PSSP to ensure consistency between the two documents. The General Plan amendment will change the land use designation on the General Plan Land Use Map to "Heavy Industrial." A corresponding amendment to the City Zoning Map will be processed to change the Site's zoning to "Perry Street Specific Plan." The draft City of Carson 2040 General Plan update, if adopted as currently proposed, would change the Site's land use designation to "Corridor Mixed Use."

1.3.1 ENVIRONMENTAL REVIEW

A mitigated negative declaration (MND) has been prepared in accordance with the provisions of the California Environmental Quality Act to address the potential environmental effects of the PSSP and will impose mitigation measures to reduce potential impacts resulting from project implementation. Any mitigations identified in the MND will be identified in the Mitigation Monitoring and Reporting Program (MMRP) adopted with the MND and are incorporated into this PSSP by reference.

1.4 SPECIFIC PLAN ORGANIZATION

Chapter 2, The Plan, articulates the overall vision for the PSSP area, including land uses, architecture, landscape, and community benefits. Chapter 3, Development Standards, lists the permitted land uses as well as development standards for building form, layout, open space, parking, and other development requirements. Chapter 4, Infrastructure, highlights utility services and improvements required by the Plan. Finally, Chapter 5, Implementation, establishes the administrative responsibilities and review authorities for managing the Plan over time.

1.5 PERRY STREET SPECIFIC PLAN CONTEXT AND EXISTING CONDITIONS

1.5.1 PERRY STREET SPECIFIC PLAN AREA

The Perry Street Specific Plan ("PSSP") is a mixed-use project located at 21611 South Perry Street, Carson, California 90745 (the "Project Site") consisting of a self-storage facility with management office, retail, and café uses (the "Project"). The Project Site is bounded by East Carson Street to the south, the Dominguez Flood Control Channel to the west, Perry Street to the east, and existing single-family residences to the north. The site encompasses approximately 2.80 acres and includes APNs 7327-010-014 and -015.

1.5.2 SITE CONDITIONS

1.5.3 THE PROJECT SITE INCLUDES TWO PARCELS WITH THE ADDRESS 21611 SOUTH PERRY STREET. THE PROJECT SITE IS CURRENTLY A VACANT AND UNDEVELOPED LOT. THERE ARE CURRENTLY 16 GROUNDWATER MONITORING WELLS PRESENT AT THE PROJECT SITE USED AS PART OF A GROUNDWATER MONITORING PROGRAM.SURROUNDING LAND USES

The Project Site is located in a region characterized by a mix of residential and commercial uses. The Project Site is located on the northwest corner of East Carson Street and South Perry Street, with the Dominguez Flood Control Channel to the west and northwest, in between the Project Site and Interstate 405 further west. Auto repair facilities and truck dealers are located to the east and south across Perry and Carson Streets. Two- and three-story multi-family housing is located across Perry Street to the east, with Perry Street Mini-Park and single-family neighborhoods to the north and northeast.

1.5.4 EXISTING GENERAL PLAN DESIGNATIONS AND POLICIES

The City of Carson's General Plan (General Plan) designates the Project Site for "Light Industrial" land uses. The Carson General Plan Land Use Element is being amended concurrent with adoption of the PSSP to ensure consistency between the two documents. The General Plan amendment will change the land use designation of the Project Site to "Heavy Industrial."

Separately, the City of Carson is currently in the process of updating its General Plan, having released the Notice of Preparation for a Draft Program Environmental Impact Report for the City of Carson General Plan Update in March 2021. The draft City of Carson 2040 General Plan update, if adopted as currently proposed, would change the Site's land use designation to "Corridor Mixed Use."

General Plan

The proposed "Heavy Industrial" General Plan land use designation would allow for the Project's proposed use and floor area ratio. The PSSP is consistent with the following General Plan goals and policies:

Land Use Element

GOAL LU-5 *Maximize the City's market potential in order to enhance and retain shopping and entertainment opportunities to serve the population, increase revenues to the City, and provide new employment opportunities.*

CONSISTENCY: The PSSP would maximize the City's market potential by facilitating development of a vacant and undeveloped lot with a mixed-use project consisting of a state-of-the-art self-storage facility with lobby/self-storage management office, retail, and café uses. Consistent with Goal LU-5, the PSSP would provide population-serving opportunities such as a self-storage service and neighborhood-serving café/retail uses, which would increase revenues to the City and provide new employment opportunities. Consistent with Policy LU-5.2, the PSSP would implement a strategy to develop the site as a neighborhood-serving commercial resource.

GOAL LU-7 *Adjacent land uses that are compatible with one another.*

CONSISTENCY: The PSSP would facilitate the development of a mixed-use project consisting of a state-of-the-art self-storage facility with lobby/self-storage management office, retail, and café uses on a currently vacant and undeveloped lot. The proposed project would be generally consistent with the mixed-use, commercial corridor along Carson Street, and the PSSP includes development standards to ensure compatibility with adjacent residential land uses. The project will create an accommodating transition between the residential and commercial areas along Carson Street by providing neighborhood-serving uses in an attractively designed facility. Therefore, the PSSP is consistent with Goal LU-7.

GOAL LU-15 *Promote development in Carson which reflects the "Livable Communities" concepts.*

CONSISTENCY: The PSSP would facilitate the development of a mixed-use project consisting of a state-of-the-art self-storage facility with lobby/self-storage management office, retail, and café uses on a currently vacant and undeveloped lot. The Project will enhance the City with neighborhood-serving amenities, such as a self-storage service and café/retail uses. The Project will be attractively designed and oriented to the pedestrian experience. The proposed combination of uses adjacent to the Perry Street mini-park will transform a vacant and undeveloped lot into a community resource and gathering place. Therefore, consistent with Policy LU-15.1, the PSSP will promote a project which reflects "Livable Communities" concepts.

Economic Development Element

GOAL ED-3 *Maximize the City's market potential, in order to enhance and retain retail opportunities to serve the population, increase City revenues, as well as provide new employment opportunities.*

CONSISTENCY: The PSSP would maximize the City's market potential by facilitating development of a vacant and undeveloped lot with a mixed-use project consisting of a state-of-the-art self-storage facility with lobby/self-storage management office, retail, and café uses. Consistent with Goal ED-3, the PSSP would provide population-serving opportunities such as a self-storage service and café/retail uses, which would increase revenues to the City and provide new employment opportunities. Consistent with Policy ED-3.1, the PSSP would implement a strategy to develop the Project, a neighborhood-serving commercial resource. Consistent with Policy ED-3.2, the PSSP would address an area of commercial demand leakage by developing a self-storage facility that would serve residents who otherwise travel to other cities for their self-storage needs. Consistent with Policy ED-3.6, the PSSP would capitalize on potential physical and market linkages among land uses by combining the self-storage facility with retail and café uses.

1.5.5 EXISTING ZONING DESIGNATIONS AND STANDARDS

The site is zoned Manufacturing, Light – D. Per the City's Zoning Code (Section 9126.9, Site Planning and Design), "D" identifies a Design Overlay designation for the project site.

Zoning Ordinance

Article 9 of the Carson Municipal Code is the Zoning Ordinance, which is the regulatory tool to implement the land use goals, policies, and actions established by the General Plan. The Zoning Ordinance identifies specific zoning districts in the city and provides development standards and regulations that apply to each district.

The Carson Zoning Code and Map is also amended by ordinance concurrent with adoption of the PSSP to ensure complete consistency with the General Plan. A new Perry Street Specific Plan (PSSP) zoning designation will replace the site's existing Manufacturing, Light—Design Overlay (ML-D) zoning. The contents of the PSSP will be adopted by ordinance and will replace the existing zoning standards, except for the existing zoning that is explicitly incorporated by reference.

Where the City's Zoning Ordinance's regulations, development standards, and/or design guidelines are inconsistent with the PSSP, the PSSP standards, regulations, and guidelines shall supersede. However, any issue not specifically addressed in the PSSP shall be subject to the existing standards and regulations of the Zoning Ordinance.

2. THE PLAN

2.1 THE PLAN OBJECTIVES

The Perry Street Specific Plan ("PSSP") is intended to achieve the following objectives:

» Provide a self-storage facility to support multi-family housing development in the vicinity of the Project Site by accommodating an anticipated increase in demand for storage space, helping the City achieve its Housing Element and Regional Housing Needs Assessment obligations.

» Provide neighborhood-serving amenities, such as a self-storage service and café/retail uses, in an attractively designed facility to revitalize a vacant and underutilized lot, increase revenues to the City, provide new employment opportunities, and create an appropriate transition between residential and commercial areas along Carson Street.

» Limit transportation and other environmental impacts compared to traditional warehouse, storage, and manufacturing uses and other commercial, retail, office or industrial projects.

2.2 THE PLAN

The PSSP authorizes and describes a mixed-use project consisting of a self-storage facility with management office, retail, and café uses (the "Project"). The self-storage facility comprises approximately 113,714 square feet in a mix of three one- and two-story buildings, with a maximum height of approximately 36.5 feet. The management office, retail and café uses total approximately 4,675 square feet. The Project will develop a vacant and undeveloped lot adjacent to the Perry Street mini-park into a neighborhood-serving resource.

The buildings house interior climate-controlled units and external non-climate units with ramp access to the second floors of the internal buildings. Storage units range in size with a 5 foot by 10 foot unit as the smallest unit for rent and a 10 foot by 38 foot unit as the largest unit for rent. The Project consists of neutral-toned building materials in Spanish styled architecture, which include Spanish accents, Spanish tile roof, spandrel glazing, and landscaping. The proposed design largely resembles a multi-family residential building in its aesthetics and massing. The exceptional design and mix of uses will revitalize the vacant lot and the surrounding area by creating an accommodating transition between the residential and commercial areas along Carson Street and providing neighborhood-serving uses potentially including a café and mail service store such as UPS or FedEx.

Access to the proposed self-storage facility is controlled via computerized access gates. 22 public parking spaces are provided outside the gates with an additional 19 spaces provided inside the gates for a total of 41 parking spaces. The premises will be under digital surveillance 24 hours a day, 7 days a week. Office hours are planned from 8am to 6pm, Monday through Sunday with access hours of 6am to 10pm, 7 days a week.

2.2.1 LANDSCAPING

The Project includes approximately 12,134 square feet of landscaping around the perimeter of the project site. A variety of drought tolerant ornamental shrubs and medium size trees, which vary in height, are included as a part of the proposed landscaping. Landscaping and plantings to be provided along the site's northern edge offer a verdant privacy screen for adjacent residential uses.

2.2.2 SECURITY

The storage facility will feature a contemporary 24-hour security system including keypad entry security gates, individually monitored and alarmed storage units, video surveillance monitoring, burglar alarms, an automatic fire sprinkler system, as well as an intercom system. Pedestrian areas including entryways into the proposed project are well-lit for security. An on-site manager or other office personnel will monitor these security systems on a control panel during hours of operation. Should there be a violation of any of the security systems when the management office is closed, an independent security firm will respond. Hence, the need for and impact upon municipal services such as police and fire are minimized.

Fire suppression within the proposed buildings will consist of a National Fire Protection Association (NFPA)-13 sprinkler system (deferred submittal) as well as surrounding fire hydrants. Construction type is Type-II non-combustible.

2.2.3 TRAFFIC & CIRCULATION

To accommodate the entry to the new storage facility, the existing driveway will be demolished and a new driveway constructed, to be located near the center of the eastern frontage along Perry Street. Curb, gutter, sidewalks and driveway will be designed and constructed with City Engineer review and approval.

No access points or curb cuts are proposed along the Carson Street arterial.

Typical daily operational traffic is low in frequency and significantly less than a traditional warehouse, storage, and other manufacturing or commercial uses. Operational traffic consists of inbound and outbound UPS delivery trucks and self-storage patrons arriving and departing the project site. Peak traffic trips to the project site are offset from the peak morning and afternoon commute periods.

2.2.4 SIGNAGE CONCEPT

Proposed signage includes building identification signage, street address, and identification/wayfinding signage for the vehicular and pedestrian entries to the buildings. In addition, the building includes billboards.

3. DEVELOPMENT STANDARDS

3.0 PURPOSE AND APPLICABILITY

This chapter establishes the land use program, allowable land uses, and the development standards that apply within the PSSP. Structures, land uses, and physical improvements—such as signs, landscaping, and lighting—within the boundaries of PSSP shall comply with all applicable requirements of this chapter. These standards are critical to the performance of each use and regulate the scale of development in the PSSP area. Furthermore, the development standards are intended to implement the vision and guiding principles as stated in Chapter 1 of the Specific Plan.

3.0.1 PERMITTED USES

This section of the Specific Plan establishes the permitted land uses within the PSSP Area and the corresponding permit requirements.

Allowable land uses within the PSSP are detailed in Table 3.2. Definitions of allowed land uses are provided in this Specific Plan document, and, when not provided in this Specific Plan document, in Chapter 9 of the Carson Municipal Code. The Director of Community Development shall have the authority to interpret the use provisions in this Specific Plan pursuant to Section 5 of this Specific Plan document governing interpretation and approve or deny any additional uses in the future.

Table 3.1 Permit Descriptions

Permit	Description
X	Automatically permitted use.
L	Automatically permitted use provided special limitations and requirements are satisfied as noted in Table 3.2.
D	Use permitted subject to the approval of the Director of Community Development.
C	Use permitted upon approval of a conditional use permit.

Table 3.2 Permitted Uses

Use	Permit	Notes
Storage Uses		
Storage, self-storage, mini-warehouse, commercial storage, personal storage, storage building for household goods (in each case, including truck rentals)	X	
Personal Services Uses		
Barber shop, beauty shop, reducing salon, manicure parlor	X	
Clothing services – laundry or dry cleaning agency, self-service laundry or dry cleaning, hand laundry, sponging and pressing, tailor, dressmaker, seamstress, shoe repair.	X	

Fix-it shop.	X	
Parcel delivery service.	X	
Copying, addressographing, mimeographing, photostating, instant printing, blueprinting, silk screening, photography, picture framing.	X	
Retail Sales		
Convenience stores	X	
Department stores, variety stores, and specialized stores for apparel, items for personal use, household items, plants and flowers, and supplies and small equipment for businesses, including antiques	L	No other secondhand items. Swap meets and flea markets, as defined in CMC 9191.670, are prohibited.
Offices		
Business, professional, financial, insurance, real estate, messenger service, advertising, newspaper, or publishing (no printing), ticket agency, travel agency, collection agency, detective agency, security service	X	
Food Sales and Services		
Restaurant (including refreshment stands, soda foundation).	X	
Restaurant, coffee shop, snack shop with outdoor dining space within the limits of the restaurant frontage, provided there is a 7-foot minimum clear path of travel on the sidewalk without obstruction.	X	
Food store	X	
Health Services		
Medical or dental office or clinic, public health center	X	
Optical services (for fitting, grinding, or mounting eyeglasses)	X	
Medical or dental laboratory.	L	Only permitted as an incidental use in a medical/dental office building or clinic.
Pharmacy	X	
Communications and Utilities		
Minor communications facilities	L	See CMC 9138.16.
Post office (including private parcel services)	X	
Temporary Uses		
Office or other permitted commercial use in a trailer or other mobile unit	L	Permitted for a period not exceeding six months during construction of a building on the same lot while a building permit is in effect. The Director of Community Development may approve reasonable time extensions.

Storage of construction materials and equipment at a construction site without the screening which would be required for permanent outdoor storage	L	Only during the period a building permit is in effect.

Maximum Building Height

No building in the Specific Plan Area shall exceed a height at any point of 36 feet.

Floor Area Ratio

Floor area ratio (FAR) is defined as the ratio of floor area to total (gross) lot area (inclusive of any required dedications, public or private easement areas, or setback areas).

FAR shall not exceed a maximum of 1.0:1 as calculated over the entire Project Site.

3.0.2 PROPERTY SETBACKS

Building setback is measured from the property line to the closest building façade. Minimum building setbacks above the ground floor are required. Projections, such as balconies, may encroach into the setback as allowed in Table 3.3, Building Setback Requirements. Buildings shall adhere to minimum setbacks as required below.

Table 3.3 Building Setback Requirements

Setback	Minimum
Front (Perry St)	25 ft.
Street Side (Carson St)	10 ft.
Rear (abutting residential)	40 ft.

Table 3.4 Permitted Encroachments Within Setbacks

Walkway connections to building entrances
Vehicular and bike access ways
Public art displays, fountains, planters, outdoor seating areas, public plazas, or other similar amenities
Cornices, eaves, belt courses, sills, buttresses, fireplaces, windows, fully screened mechanical equipment, or other similar features may extend or project into a required front or side yard setback no more than 30 inches
Awnings, canopies where overhang may encroach 36 inches into required setback
Outdoor dining may encroach into street-adjacent setback if a clear and unobstructed sidewalk is provided that is a minimum of 5 feet wide

3.1 PARKING AND LOADING

3.1.1 MINIMUM PARKING REQUIREMENTS

The Project shall provide a total of 41 parking spaces, including 39 standard spaces and 2 accessible spaces.

3.1.2 DESIGN OF PARKING

Expansion of Leasable Floor Area

Upon any future request for change or enlargement of a building or structure that increases the amount of leasable floor area, additional parking and loading spaces shall be provided for the new leasable floor area without diminishing the existing parking provided for the existing use, buildings, and/or structures, unless the Director of Community Development determines that such additional parking is not required to maintain compliance with Section 3.1 of this Specific Plan.

Parking Areas

The Project shall provide 22 public parking spaces outside the computerized access gates for the self-storage facility, and 19 parking spaces inside the access gates.

The Project shall include a new driveway, located near the center of the eastern frontage along Perry Street. The driveway entrance shall be 28 feet wide, and all drive aisles shall be at least 28 feet wide.

Parking Design and Standards

Parking spaces shall adhere to the following dimensions:

- Standard spaces: 8.5' x 18'
- Parallel spaces: 8' x 24'

Electric Vehicle (EV) Charging Stations

EV charging stations shall be provided in compliance with state building code.

3.2 LANDSCAPE STANDARDS

The proposed Project would include approximately 12,134 square feet of landscaping around the perimeter of the Project Site. A variety of drought tolerant ornamental shrubs and medium size trees, which would be varying in height, would be included as a part of the proposed landscaping. Landscaping and plantings to be provided along the site's northern edge will offer a verdant privacy screen for adjacent residential uses.

3.3 LIGHTING

New lighting would include building identification wayfinding, and security lighting. Low emittance lighting would be provided on the walls of the buildings facing the internal drive aisles and mounted at a height of approximately 12 to 14 feet. Pedestrian areas including entryways into the proposed Project would be well-lit for security and ground-mounted light fixtures would be shielded and directed towards the areas to be lit and away from adjacent light-sensitive residential land uses. A detailed safety, lighting, and signage lighting plan shall be submitted and approved by the Director of Community Development, prior to issuance of a building permit, where the plan will discuss strategies for avoiding spillover lighting and to ensure pedestrian safety. Lighting for uncovered parking areas, vehicular access ways, and walkways shall not exceed a height of 25 feet. In addition, the following lighting standards apply:

1. Lighting within the Specific Plan Area shall be directed to driveways, walkways, and parking, and away from adjacent properties and public rights-of-way.
2. Outside of "public" areas of the Plan Area, lighting temperatures shall not exceed 3000 Kelvin.

3. The pedestrian lights should have a relatively low wattage light source in the warm (yellow) color range (close to 3000 Kelvin).
4. Pedestrian-scaled pole lighting shall provide a minimum of one (1) foot-candle in all public areas.
5. Storefront entries shall be illuminated.
6. Outdoor lighting shall be shielded to prevent glare on adjacent properties.
7. Energy-efficient light bulbs shall be used to minimize environmental impacts.
8. Pedestrian-scale decorative street lighting in sidewalks shall have a maximum spacing of 80 feet on-center. Light sources should be 12 to 14 feet above finished grade.
9. Site lighting requirements shall be one (1) foot-candle per square foot to lower the amount of light that spills across the site.
10. Lighting fixtures shall be integrated into the landscape to facilitate safe pedestrian circulation.
11. Dark-sky lighting is encouraged to minimize light-pollution. Lights should be shielded on top and sides, avoiding all up-lighting.
12. Full-cutoff fixtures shall be used in landscape lighting. Excessive lighting shall be avoided.

3.4 SIGNAGE

Proposed signage would include building identification signage, street address, and identification/wayfinding signage for the vehicular and pedestrian entries to the buildings. In addition, the building would include billboards.

All signs proposed for the Project will be governed by a comprehensive sign program that will provide internal consistency in design style and direction for placement and size of signs, including a standardized wayfinding program. The comprehensive sign program shall also include provisions that ensure that lighting from signs shall not significantly intrude upon or impact adjacent residential uses. The comprehensive sign program will be submitted after approval of the Specific Plan for review and approval by Director of Community Development pursuant to Chapter 6, *Administration,* as a part of the ministerial review and approval process.

The following standards shall apply:

1. Unless specifically addressed below, signage within the Specific Plan Area shall be governed by Section 9138.17F of the CMC.
2. The base calculation for wall signs shall be two square feet of signage per linear foot of building frontage.
3. Capital letters shall not exceed a height of 32 inches. Lowercase letters shall not exceed a height of 24 inches. When using a logo, logo size should not exceed 24 inches. Two rows of letters shall not exceed 36 inches. (See Figures X to X.)

4. Blade sign structure incorporated into buildings by the contractor must be installed with individual aluminum fabricated dimensional halo channel letters mounted to a vertical blade sign. With a max sign area or 75 square feet (per side).
5. The sign area of a monument sign shall not exceed 1.5 square feet for each foot of street frontage. Sign placement shall not exceed a maximum of one for every 150 linear feet of street frontage. Signs shall be at least 7.5 feet from interior lot lines. Monument signs shall be a maximum of 8 feet high with a maximum 18-inch base and should not be a hazard to pedestrian or vehicular traffic. Sign content shall be limited to tenant names (with no more than two rows of letters). (See Figures X to X.)
6. Commercial building signage shall be limited to channel letters, reverse channel letters, or other decorative forms of signage approved by Director of Community Development . Cabinet or box signs on walls are expressly prohibited. Pole signs are prohibited.
7. The sign sizes and locations shall be compatible with the design of the building to provide visibility to the public streets and visibility for pedestrians.

3.5 FIRE STANDARDS

1. Fire suppression within buildings shall consist of a National Fire Protection Association (NFPA)-13 sprinkler system as well as surrounding fire hydrants.
2. Construction type is to be Type-II non-combustible.
3. All-weather fire department access shall be provided.
4. Vehicular access to all required fire hydrants must be provided and maintained as serviceable throughout construction.
5. Provide fire-department- or City-approved street signs and building access numbers prior to occupancy.
6. All buildings over 5,000 square feet shall have sprinkler systems.
7. A Knox box or other access provisions shall be provided through all gates.
8. Approval from the fire department is required prior to issuance of building permits.

3.6 NOISE ATTENUATION

The City's General Plan Noise Element identifies the maximum exterior noise level for commercial and industrial uses as 75 dBA CNEL (maximum interior exposure is 55 dBA CNEL for commercial uses and 65 dBA CNEL for industrial uses).

3.7 TRASH AND RECYCLING

3.7.1 TRASH

- Any planned trash and recycle centralized locations for the proposed Project will be finalized by the waste management provider during the site development review and approved by the Development Director prior to issuance of the first building permit.
- Trash and recycling areas serving the Project shall either be enclosed within a building or constructed of solid masonry material with a decorative exterior surface finish compatible with the main structure. The walls shall be a minimum of six feet in height.
- All centralized trash and recycling areas shall include a four-inch concrete pad.
- Any provisions not listed herein or approved in the site development review are subject to CMC 9164.2 Residential Trash Areas.

3.7.2 COLLECTION AND LOADING OF RECYCLABLE MATERIALS

- Any recycling area(s) shall be located so they are at least as convenient as the location(s) where solid waste is collected and loaded. Whenever feasible, recyclable materials should be adjacent to or incorporated within the trash collection areas.

4. INFRASTRUCTURE

The proposed project will have minimal effects upon the City's infrastructure. Figures 1 - 8 (and further detailed text below) are excerpted from *Carson Self-Storage Preliminary Utilities Technical Memorandum*, Omega Engineering Consultants, March 2022 [Appendix A]. Excerpts display and discuss existing and proposed storm drains, sanitary sewer lines, water lines, natural gas, electrical lines, and communication lines.

4.1 UTILITIES

4.1.1 WATER

Existing Conditions

Water utilization will be minimal with the largest amount being devoted to landscape irrigation. California Water Service owns and operates a 12" water main in the east side of S Perry Street and a 12" branch off the main even further in the east side of S Perry Street, adjacent to the project. There is one fire hydrant on the east side of S Perry Street, adjacent to the project site.

Proposed Condition

Estimated Project Water Demand

Proposed Use	Average Generation Factor [(a)]	Square Footage	Average Daily Water Demand (GPD)	Estimated Water Use (AFY) 2045 – Ultimate Condition
Café / Commercial	0.28 GPD/SQFT	4,675 SQFT	1,309	1.5
Landscaping / Open Space	-	12,134 SQFT	254	0.29
System Water Losses (3.4%)	-	-	53	0.06
Existing Site Use	0	0	0	0
Proposed Total Demand	-	-	1,616	1.85

a) All flows were calculated using historical data for the Dominguez District, as provided in the Cal Water WSA Water Factor Tool.
b) Estimates of landscape irrigation are based on MWELO ETWU calculations provided by Cal Water. Landscape irrigation estimates include all irrigated areas including public open space and private yards.

Domestic water is expected to be the main contributor of water consumption for the Project. The total water demand for the Project is conservatively estimated at 1.85 AFY at buildout. The project will require the construction of new onsite water service infrastructure to serve the new buildings.

Fire water demands place the greatest immediate demand on the water network. Due to size and area of the Project, LACFD will require onsite fire hydrants. A regional Fire Hydrant Flow Test has been received from California Water to confirm the pressure from the existing fire hydrant. The hydrant tested is on the west side of S Perry Street, within immediate vicinity of the Project site. The flow test demonstrated that the hydrant is capable of 4,144 gallons per minute.

According to the 2019 California Fire Code Section 501.3, construction documents for proposed fire apparatus access, location of fire lanes, security gates across fire apparatus roads and construction documents and hydraulic calculations for fire hydrant systems shall be submitted to the fire department for review and approval prior to construction. Referencing the California Fire Code Appendix B (Table B105.1) and Appendix C (Table C105.1)

- The water system must deliver 2,500 GPM at 20 psi for 2 hours.

- The spacing between fire hydrants does not exceed 450 feet via vehicular access.

- The distance of proposed buildings must be within 225 feet of a vehicular access roadway that is a minimum of 20 feet wide, paved with concrete or asphalt and does not exceed 15% grade.

California Water Service Company has confirmed that the Fire Hydrant Flow Test form results indicate that available pressure and capacity meet the proposed demands. All buildings will be sprinklered.

4.1.2 SEWER

Existing Condition

The Project site is located within the Consolidated Sewer Maintenance District run by LACDPW. There is an existing 10" clay sewer main in the center of S Perry Street adjacent to the Project Site that is owned by LACDPW.

Proposed Condition

LACDPW's average wastewater generation factors were used to calculate the estimated demand of the proposed Project as follows:

Proposed Use	Average Generation Factor [a]	Proposed Number of Units	Average Daily Water Demand (GPD)
Office	**200/1,000 GPD/SF**	**3,125 SF**	**625**
Café/Restaurants	**1,000/1,000 GPD/SF**	**1,550 SF**	**1,550**
Storage	**25/1,000 GPD/SF**	**109,039 SF**	**2,725**
Proposed Total Demand	**-**	**-**	**4,900**
Proposed Total Demand with 2.5 Peaking Factor	**-**	**-**	**12,250**
Existing Condition	**-**	**-**	**0**

a) All flows were calculated using the County of Los Angeles sewer generation values. See appendix for entire sewer generation.

The proposed project will contribute 12,250 GPD or .02 cubic feet per second (cfs), when a peaking factor of 2.5 is factored in. This totals a net increase of 12,250 GPD when compared to current vacant condition.

It is anticipated that the project will flow 100% into the existing 10" diameter sewer through two separate sewer laterals on the project.

A will serve letter request was submitted to the LACSD for a 100% discharge of the project sewer that enters their system.

The Project will require construction of new wastewater infrastructure to serve the new buildings. Installation of wastewater infrastructure will be limited to on-site wastewater distribution, and minor off-site work associated with connections to the public main.

4.1.3 ELECTRICITY

The existing power service in the vicinity of the Project site is supplied by Southern California Edison. Figures 7 and 8 display the Existing and Proposed electrical service for the site.

Proposed Condition

Temporary Power: There is overhead power available from the pole at the south-east corner of the property which can be a potential source, given that the temporary power is no more than 200A-600A Single Phase.

Permanent Power: The proposed development would have Southern California Edison run a primary cable from the existing Edison manhole on South Perry Street to a proposed onsite 10' x 12' transformer pad approximately 175' away. Based on historical data provided to SCE, to service buildings of this size & expected usage in this climate zone, a single transformer on a single 10'x12' transformer pad will be sufficient to feed the entire site.

All estimated kVA's per building can be found on the proposed utility exhibit in the *Carson Self-Storage Preliminary Utilities Technical Memorandum*, Omega Engineering Consultants, March 2022 [Appendix A].

There are no service upgrades expected at this time.

4.1.4 NATURAL GAS

The existing natural gas service in the vicinity of the Project site is supplied by Southern California Gas Company (SoCal Gas).

Existing Condition

The project gas service provider will be Southern California Gas Company. There are no apparent gas facilities on the existing site.

Proposed Condition

The proposed development would have the project connect to the existing gas mainline located in South Perry Street east of the property.

Southern California Gas will need to obtain permits to conduct work in the public right of way. Additionally, note that gas meters must be 3' away from any doors and windows, if under an opening window must be minimum 10' above. Gas meters must be easily accessible for emergencies & maintenance.

A will-serve letter was received from Southern California Gas Company on 2/7/2022 (*Carson Self-Storage Preliminary Utilities Technical Memorandum*, Omega Engineering Consultants, March 2022, Appendix A, page 182). Based on similar projects of this size, there are no service upgrades expected at this time.

4.1.5 TELECOMMUNICATIONS FACILITIES

The existing telecommunications services in the vicinity of the Specific Plan Site are supplied by various utilities providers such as AT&T Distribution South. From a records request through the utility providers, it has been determined that aerial and underground facilities exist. Will-serve letters have been received from Charter (dated 2/22/22) & AT&T Distribution South (dated 1/31/22) (*Carson Self-Storage Preliminary Utilities Technical Memorandum*, Omega Engineering Consultants, March 2022, Appendix A, pages 184 and 186 respectively). Based on similar projects of this size, there are no service upgrades expected at this time.

4.2 GRADING

Project construction would include the removal of the existing driveways, the excavation of approximately 906 cubic yards of soil and import approximately 257 cubic yards of soil. In addition, the upper 6 feet of existing earth materials within the proposed building footprint areas would be excavated and properly compacted for foundation and slab support.

During the site preparation approximately 150 cubic yards (cy) of concrete/asphalt debris would be generated. During the grading phase approximately 906 cy of soil would be generated with approximately 257 cy being imported as fill.

4.3.1 STORMWATER COLLECTION

Existing Condition

The site as it currently exists is the bare pad where a previous development stood. The surface cover consists of compacted fills, and base materials left by the previous development. The existing site is approximately 3.5% impervious and underlain by soil type #3. Details are provided in the Geotechnical Investigation of the site by Geocon West, Inc. as included in *Carson Self-Storage Preliminary Utilities Technical Memorandum*, Omega Engineering Consultants, March 2022 [Appendix A].

The Specific Plan Site is not located within a FEMA FIRM area with reduced flood risk due to levee, also known as Zone "X." Stormwater runoff currently flows into existing offsite improvements which will also be utilized in the proposed conditions as described below .

Proposed Condition

The proposed development will re-grade the entire site but will keep the same discharge point as the existing and previous developed conditions. The proposed site will be 89.7% impervious. The project will construct gutters that wrap around the self-storage facilities and direct the runoff generated from the site towards the westerly portion of the site. Runoff will then drain into a 10'x20' Modular Wetland System for treatment. Following treatment, the stormwater will drain out via pipe flow to a storm drain clean out structure thence to the existing 5' storm drain inlet and ultimately the Dominguez Channel. This point is referred to as Discharge Point # 1 in this report. The discharge point will have a 50-year peak discharge that increases from the existing condition.

Hydrology Results

Table 1 summarizes the hydrology results demonstrating peak flows for the 25-,50- and 100-year storm events under previously developed, existing and proposed project descriptions

Table 1. Previously Developed, Existing, and Proposed Peak Runoff Flows

	Previously Developed	Existing	Proposed		
Storm Event	Q_{Total} [cfs]	Q_{Total} [cfs]	Q_{Total} [cfs]	% Change from Existing	% Change from Prior Development
25-Yr	6.26	1.96	5.57	+64.8%	-11.0%
50-Yr	7.61	3.12	6.74	+53.7%	-11.4%
100-Yr	8.55	4.08	7.79	+47.6%	-8.8%

The review demonstrates that the project will exceed the existing stormwater flows. However, the proposed project will treat and convey stormwater runoff to the existing drainage infrastructure that previous site development also drained to. The existing infrastructure includes a concrete brow ditch running parallel to the southwest property line of the site. This brow ditch flows into a 60" RCP levee drain that discharges to Dominguez Channel, a tidally influenced water body. This offsite drainage infrastructure appears to be unchanged since previous site development.

The Project will include the installation of private roof downspouts, planter drains throughout the project site to collect roof and site runoff, and direct stormwater to the LID system through a series of gutters. This onsite stormwater conveyance system would serve to prevent onsite flooding and nuisance water build-up on the Project Site.

For additional information and detailing see the full Hydrology report in the *Carson Self-Storage Preliminary Utilities Technical Memorandum*, Omega Engineering Consultants, March 2022 [Appendix A].

The LID requirements, approved by the Regional Water Quality Control Board, call for the treatment of the peak mitigation flow rate or volume of runoff produced either by a 0.75" 24-hr rainfall event or the 85th percentile rainfall event, whichever is greater. Under section 3.1.2 of the LID Manual, this post-construction stormwater runoff from the new development shall be infiltrated, evapotranspirated, captured and used, and/or treated through high efficiency BMP's onsite. The rainfall intensity of the 85th percentile rainfall event governs.

Table 1 Summary LID Mitigation BMPs

Description	Area [ac]	Impervious Area [ac]	Required Flowrate (CFS)	BMP Type	Provided Flowrate (CFS)	% Treated	Impervious Area Untreated [ac]
DMA-1	2.77	2.49	0.702	20x10 Modular Wetland System	0.710	100	0
Total Percent Treatment						100 %	

For Further information and detailing, see LID Plan in *Carson Self-Storage Preliminary Utilities Technical Memorandum*, Omega Engineering Consultants, March 2022 [Appendix A].

4.3 CONSTRUCTION

Construction is anticipated to start in [1/3/2023] and would take approximately [14 months to complete, ending in [2/2024]. It is estimated that the Project Site would be occupied and in operation by [4/1/2024]. Prior to the start of construction, the Specific Plan Site would be clearly defined with fencing and staking. Construction staging would take place within construction boundaries and would occur over the course of three phases: grading/site preparation, building construction, and exterior finishes/sitework.

Soil conditions and further site preparation processes are provided in the Geotechnical Investigation of the site by Geocon West, Inc. as included in *Carson Self-Storage Preliminary Utilities Technical Memorandum*, Omega Engineering Consultants, March 2022 [Appendix A].

Project construction would include the removal of the existing driveways, the excavation of approximately 906 cubic yards of soil and import approximately 257 cubic yards of soil. In addition, the upper 6 feet of existing earth materials within the proposed building footprint areas would be excavated and properly compacted for foundation and slab support

4.4.1 ESTIMATED CONSTRUCTION TIMING

Construction staging would take place within construction boundaries and would occur over the course of three phases:

- Phase I – Grading/Site Preparation
- Phase II – Building Construction
- Phase III – Exterior Finishes/Sitework

Table 4.1 Construction Timing

Construction Period	[Start Date]	[End Date]
Grading/Site Preparation	[1/2023)	3/2023
Building Construction	[6/2023	2/2024
Exterior Finishes/Sitework	[11/2023	2/2024

During all stages of construction, there will be no full-time closures to any parking or travel lanes near the Specific Plan Site. There will also be no sidewalk closures for the duration of construction. The sidewalks along Perry Street and Carson Street fronting the construction site will be open during construction.

4.4 TRANSPORTATION AND CIRCULATION

Access to the self-storage facility will be controlled via computerized access gates. 22 public parking spaces will be provided outside the gates with an additional 19 spaces provided inside the gates for a total of 41 parking spaces.

To accommodate the entry to the new storage facility, the existing driveway will be demolished and a new driveway constructed, to be located near the center of the eastern frontage along Perry Street. Curb, gutter, sidewalks and driveway will be designed and constructed with City Engineer review and approval.

No access points or curb cuts are proposed along the Carson Street arterial.

Typical daily operational traffic is low in frequency and significantly less than a traditional warehouse, storage, or other manufacturing uses. Operational traffic consists of inbound and outbound UPS delivery trucks and self-storage patrons arriving and departing the project site. Peak traffic trips to the project site are offset from the peak morning and afternoon commute periods.

The *21611 South Perry Street Local Transportation Assessment* by Fehr and Peers, dated January 18, 2022 [Appendix B] was conducted in order to evaluate local traffic conditions before and after completion of Perry Street Specific Plan project, in addition to assessing the project's peak parking demand.

Trip Generation – The PSSP project will generate an estimated net increase of 580 daily trips, including 93 trips (49 inbound/44 outbound) during the AM peak hour and 45 trips (22 inbound/23 outbound during the PM peak hour.

Intersection Traffic Analysis evaluates the project Levels of Service at each study intersection under the Existing plus Ambient Growth plus Project and Future Year (Year 2023) plus Project condition to estimate the incremental increase in seconds of delay per vehicle expected to be caused by the proposed Project.

Table 6: Future Base and Future Plus Project Levels of Service

Study Intersection	Period	Future Base		Future + Project	
		Delay (s)	LOS	Delay (s)	LOS
1. Avalon Boulevard & Carson Street	AM	**59.1**	**E**	**59.8**	**E**
	PM	**79.0**	**E**	**79.4**	**E**
2. I-405 SB Ramps & Carson Street	AM	9.5	A	9.9	A
	PM	11.3	B	11.4	B
3. I-405 NB Ramps & Carson Street	AM	7.7	A	7.9	A
	PM	8.1	A	8.2	A
4. Perry Street & Project Driveway	AM	Project Only Scenario		9.5	A
	PM			9.4	A
5. Perry Street & Carson Street	AM	21.8	C	31.6	D
	PM	27.2	D	31.3	D
6. Wilmington Avenue & Carson Street	AM	29.8	C	30.2	C
	PM	29.4	C	29.5	C

Source: Fehr & Peers.

The addition of Project trips does not cause average vehicle delay at any study intersection to worsen from LOS D or better LOS E or F.

The addition of Project trips does not cause spill over queuing at any study intersection. At intersections already experiencing spill over queueing without Project trips, the addition of Project trips increases the queue by no more than one vehicle at any study intersection approach.

Project will not trigger any need for street improvements nor need any capacity upgrades.

Using the ITE (*Institution of Transportation Engineers*) method for estimating parking demand, the proposed on-site parking supply of 41 spaces is more than adequate to accommodate the estimated peak parking demand of 29 spaces.

Table 9: Peak Parking Demand Estimate – ITE Method

ITE Land Use Code	Equation [2]	Project Size	Project Demand
151 – Mini-Warehouse [1]	P = 0.1x	111,464 SF	11
936 – Coffee/Donut Shop without Drive-Through Window	P = 10.49x	1,550 SF	16
920 – Copy, Print, and Express Ship Store	P = 3.01x	700 SF	2
		Total	**29**

[1] The ITE report specifies Mini-Warehouse to be "typically referred to as 'self-storage' facilities."
[2] P = Parked Vehicles, x = 1,000 square feet increments of gross floor area.
Source: Fehr & Peers.

5. IMPLEMENTATION

5.0 ADMINISTRATIVE PROCEDURES AND REVIEW

Approval of the PSSP indicates acceptance by the Carson City Council of the PSSP's framework for the development of the plan area. Project approvals will include a Development Agreement (DA) between the developer and the City of Carson. The PSSP supplemented by the DA establish the standards and regulations that constitute the zoning for the plan area and regulate development within the area. The PSSP provisions shall take precedence over the requirements of the zoning code of the Carson Municipal Code (CMC). If not specifically addressed in the PSSP, the applicable provisions of the CMC shall apply.

Although every effort has been made to include provisions in this Specific Plan that are clear, there may be a need to interpret provisions in light of specific and unusual conditions. When such interpretations are necessary, the Director of Community Development shall be responsible for the interpretation of the provisions of the PSSP, with the right of appeal to the Planning Commission and City Council. The provisions of the PSSP shall be enforced as follows:

1. The Director of Community Development shall be the City administrator responsible for enforcing the regulations, site development standards, and procedures set forth in the PSSP.
2. The Director of Community Development shall have the administrative authority for interpretation related to the enforcement of the PSSP. The Director of Community Development may submit his/her interpretations for review by the Planning Commission. Decisions of the Planning Commission shall be subject to appeal to the City Council.
3. In the event of any ambiguities or silence on a particular topic that cannot be resolved through the provisions of this Specific Plan, other sections of the City of Carson General Plan and Zoning Code shall guide interpretations of this Specific Plan.

5.1 TYPE OF REVIEW PROCEDURES

Approval of development within the PSSP shall be subject to the review authority and review processes set forth in this Section. Chapter 1 of Article IX of the Carson Municipal Code shall apply to matters not covered in this Specific Plan. If there is any conflict between the provisions of this Specific Plan and Chapter 1 of Article IX of the CMC, the provisions of this Specific Plan shall control.

Unless otherwise set forth below, to be valid, any appeal must be filed with the City Clerk within fifteen (15) days of the decision upon which the appeal is made. All decisions shall automatically become final unless a valid appeal is timely received. Unless specifically provided for in this Specific Plan, the regulations set forth in Chapter 2 of Article IX of the CMC, entitled "Subdivision Regulations," shall apply to all divisions of land hereafter made of property within the PSSP Area.

The following types of applications shall be reviewed and acted upon as listed in Table 5.1.

The PSSP shall be administered by the City Council, the Planning Commission, and the Director of Community Development (each a Review Authority as set forth in Table 5.1).

Table 5.1: Review Authority

Type of Application	Community Development Director Ministerial Approval (c)	Planning Commission discretionary approval (with appeal to City Council)	City Council approval (after Planning Commission recommendation)
Conditional Use Permit		■	
Sign Plan (c)	■		
Amendments to Approved Sign Program (c)	■		
Minor Exceptions	■		
Specific Plan Amendments			■
Substantially Conforming Changes to Site Plan	■		
Site Plan Review (other than Substantially Conforming Changes) (b)		■	
Special Event Permits	■		
Temporary Use Permits	■		
Variance		■	
Interpretations	■		

(a) All decisions of the Planning Commission may be appealed to the City Council.
(b) Any subsequent amendment to the site plan shall be subject to the provisions of Section 5.6 below.
(c) No public hearing is required.

5.2 INTERPRETATION

The Director of Community Development has the authority to interpret any provision of this PSSP, consistent with the requirements of CMC Section 9172.24 Interpretation Procedures. Whenever the Director of Community Development determines that the meaning or applicability of any requirement is subject to interpretation, the Director of Community Development may issue an official interpretation. When used in this PSSP, the words "shall" and "must" are always mandatory. The word "should," as used in the design standards section of this plan, is not mandatory but is strongly recommended.

It is not intended that this PSSP interfere with, abrogate, or annul any easement, covenant, or other agreement to which the City is a party. In accordance with state law, the provisions of this PSSP shall control over duplicative and conflicting provisions of the Carson Municipal Code. In the event this PSSP is silent as to a development standard or procedure, the provisions of the City's zoning ordinance shall control.

5.3 MINOR EXCEPTIONS

The Minor Exceptions procedure is established to grant minor relief from development standards, under limited circumstances, when the granting of such relief will provide for better design and function of the structure, or addition to a structure, proposed. The Director of Community Development or his/her designee may approve a Minor Exception or deviation to the standards and land uses described herein, provided the Director conducts appropriate review under CEQA, if required, and makes the following findings:

1. The granting of the Minor Exception will result in design improvements, or there are space or other restrictions on the site which preclude full compliance with PSSP requirements;
2. The granting of the Minor Exception, with any conditions imposed, will not be materially detrimental to the public welfare or injurious to the property or improvements in the PSSP Area; and
3. The granting of the Minor Exception will not be contrary to the objectives of the PSSP.

Minor Exceptions may include:

- Building setback deviation – up to 15 percent.
- Height of fence or wall deviation – up to 15 percent.
- Projections into required setbacks – up to 15 percent.
- Building height increase – up to 15 percent.
- Reduction in off-street parking requirements – up to 10 percent.
- Modification to any other development standard so long as the change does not result in an increase in the Project's total square footage as defined by this Specific Plan.

Deviations to PSSP development standards in excess of those cited in the subsection above as well as changes to the PSSP permitted uses listed in the Development Standards section shall require a Specific Plan Amendment.

5.4 SPECIFIC PLAN AMENDMENTS

Amendments to the PSSP shall be processed in accordance with the application provisions of state law provided in California Government Code sections 65450 et seq. The procedure in Section 9172.11 of the CMC shall be followed for hearing, notice, and decision of a Specific Plan Amendment by the Planning Commission and City Council. Each request for amendment shall specify the sections or portions of the PSSP that are affected by the amendment.

5.5 CONDITIONAL USE PERMITS

Conditional Use Permits shall be filed and processed per Chapter 9172.21 of the City of Carson Municipal Code.

5.6 SITE PLAN REVIEW

A Site Plan Review application is being processed concurrently with the adoption of this Specific Plan in accordance with Chapter 9172.23 of the City of Carson Municipal Code. Subsequent modifications to the approved Site Plan shall be processed administratively by the Director of Community Development provided the changes substantially conform to the approved Site Plan ("Substantially Conforming Changes"). Substantially Conforming Changes are modifications and alterations to the type, location, placement, and design of the proposed structures and overall development within the PSSP that (i) do not result in an increase in project square footage and/or overall development intensity and (ii) do not trigger a Minor Exception or Specific Plan Amendment, as defined above. Substantially Conforming Changes to the approved Site Plan shall be considered ministerial and are not appealable. Substantially confirming changes should be construed liberally in the interest of providing maximum flexibility within the approved PSSP development envelope and associated environmental impacts studied and disclosed in the MND.

5.7 SPECIAL EVENT PERMITS

A Special Event or Use Permit may be granted to allow the occurrence of an event, activity, or use for a period of 4 or more days, but not exceeding 30 consecutive days, and no more than 60 days in any calendar year. Special Event Permits shall be filed and processed per Chapter Division 8. Special Requirements for Certain Uses of the City of Carson Municipal Code.

5.8 TEMPORARY USE PERMITS

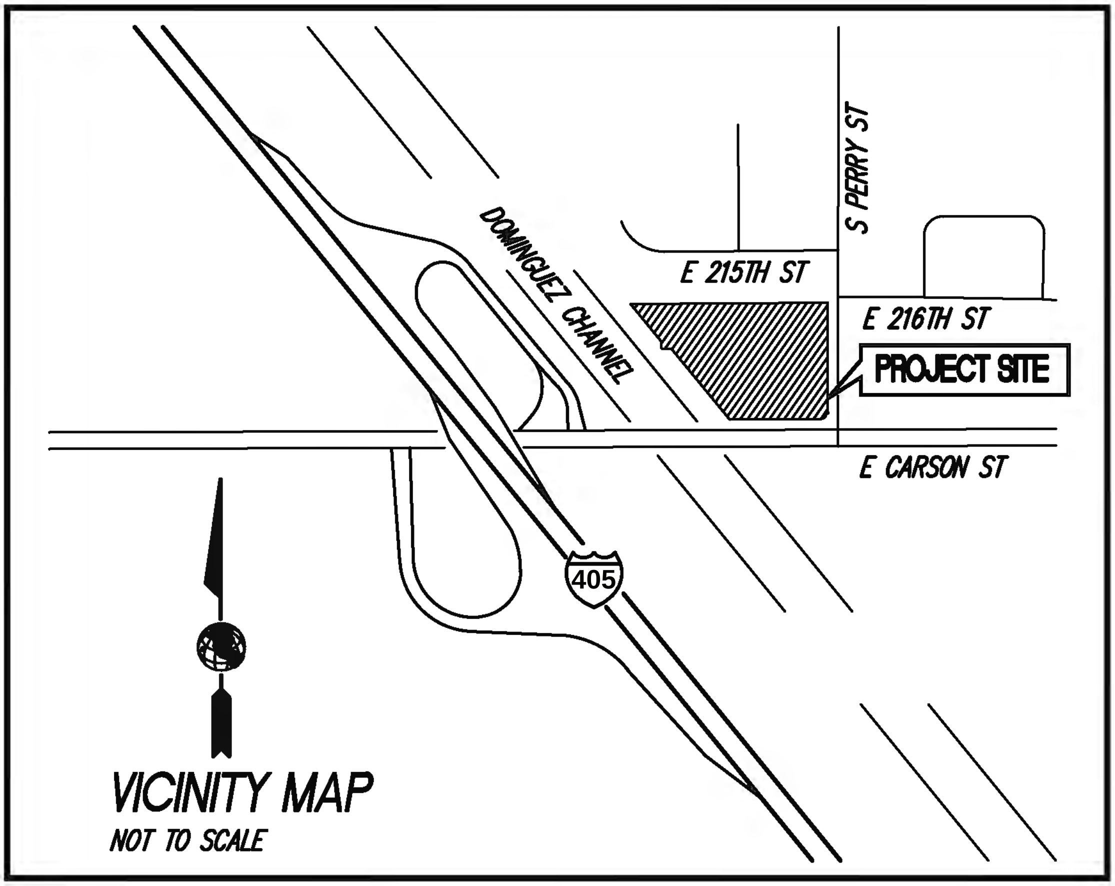
Temporary Use Permits shall be filed and processed per Chapter Division 8. Special Requirements for Certain Uses of the City of Carson Municipal Code.

5.9 IMPLEMENTATION

The ownership, construction, management, conditions of approval, and operation of the PSSP Area will be described in a separate agreement with the City of Carson.

PERRY STREET SPECIFIC PLAN

Fig. 1



PERRY STREET SPECIFIC PLAN

Fig. 2

DRAINAGE BASIN DATA

BASIN #	AREA (AC)	SOIL TYPE	IMPERV. (%)	I_{25} (IN/HR)	I_{50} (IN/HR)	I_{100} (IN/HR)	Q_{25} (CFS)	Q_{50} (CFS)	Q_{100} (CFS)
P-1.1	1.44	3	90.6	2.21	2.63	3.10	2.70	3.23	3.83
P-1.2	1.33	3	88.9	2.56	3.11	3.49	2.88	3.52	3.97

LEGEND

BASIN NUMBER .... P-#.#

AREA LIMITS ....

DRAINAGE FLOW PATH ....

BUILDING AREA ....

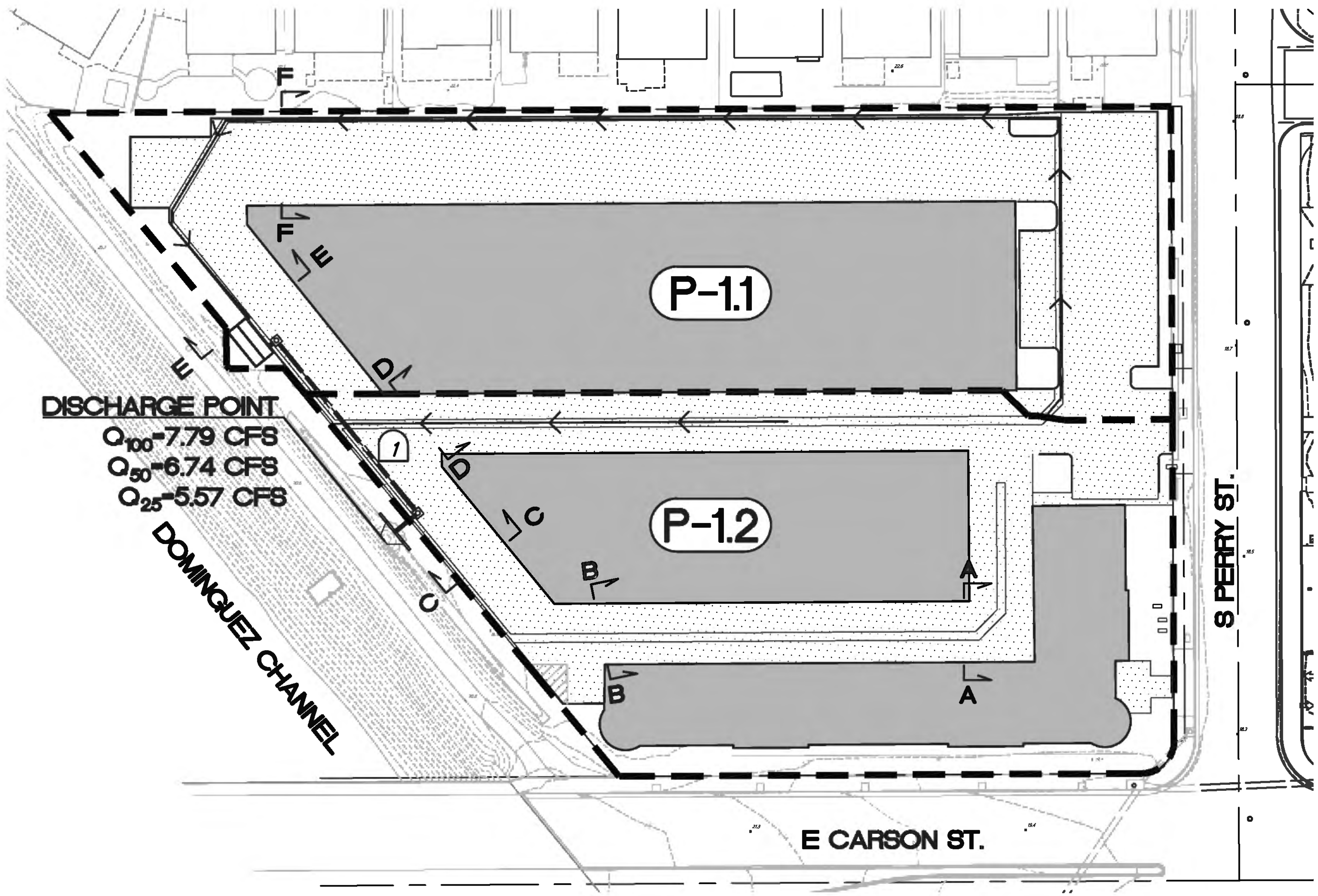
PAVEMENT AREA ....

PERVIOUS AREA ....

(X) PIPE DATA

PIPE #	DIAMETER (INCHES)	SLOPE (%)	DEPTH /DIA	V_{100} (FPS)	Q_{100} (CFS)
1	18	1.0	0.64	6.52	7.79

NOTE: SEE APPENDIX 4 IN THE HYDROLOGY REPORT FOR GUTTER ANALYSIS SECTIONS



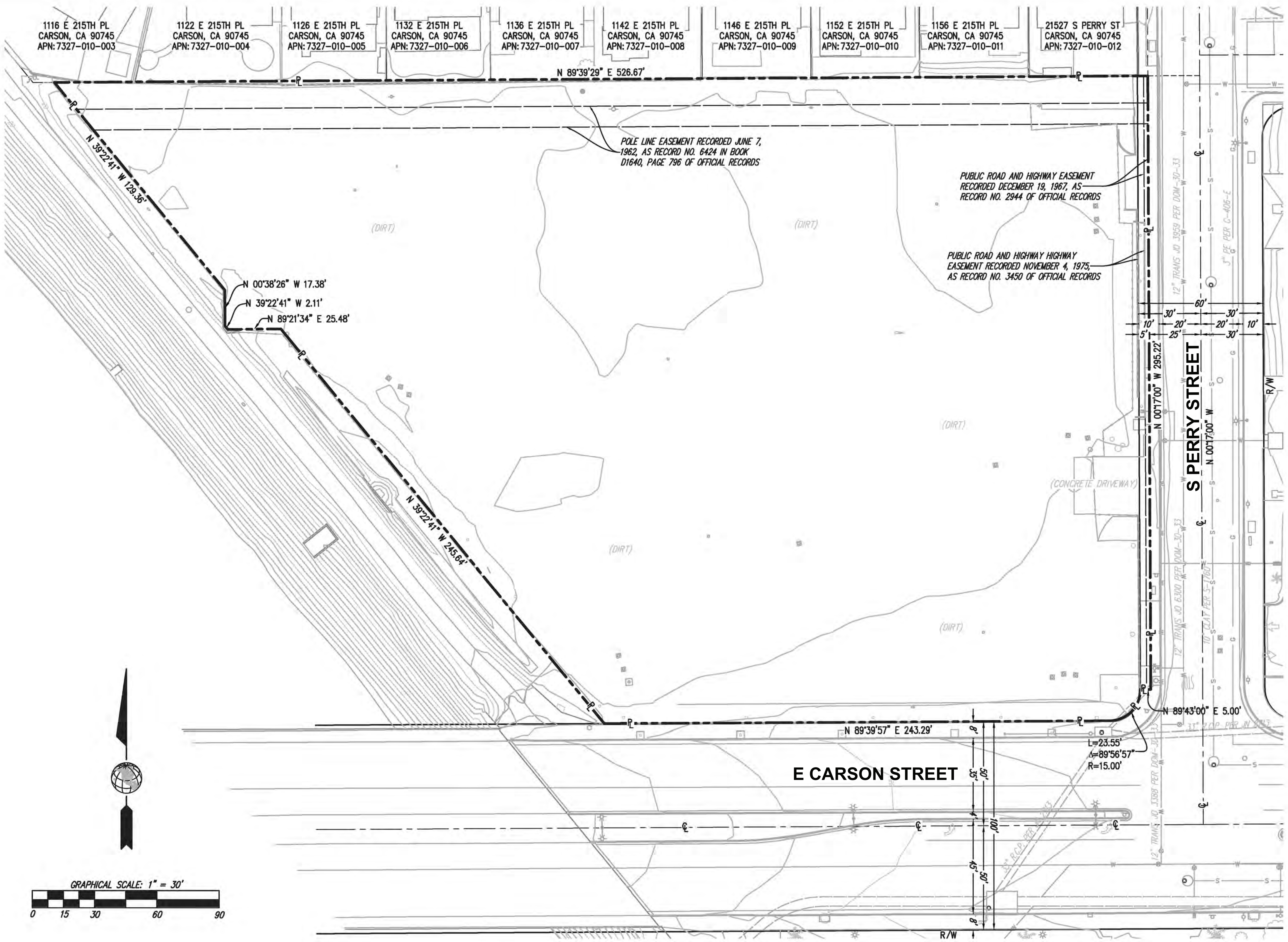
GRAPHICAL SCALE: 1" = 60'

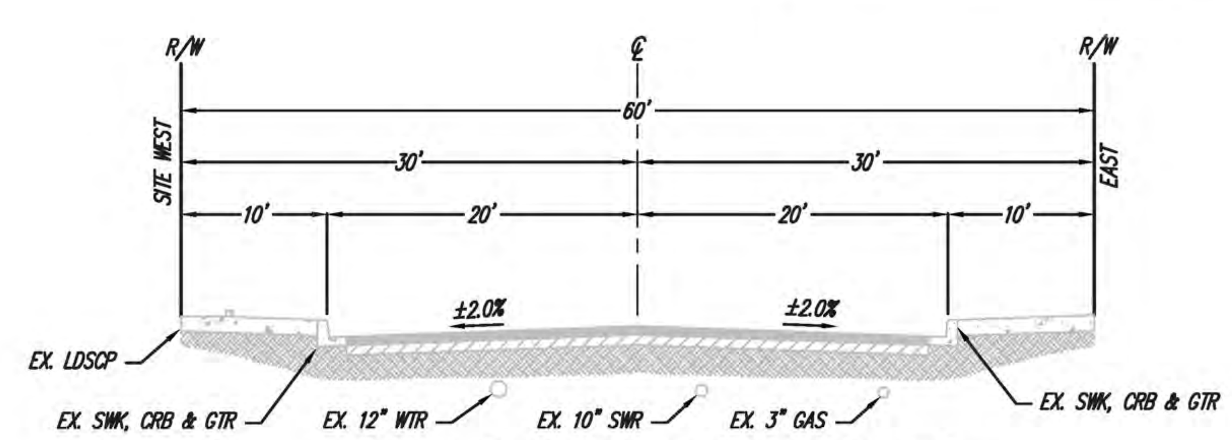
0 30 60 120

CARSON SELF-STORAGE PROPOSED HYDROLOGY EXHIBIT

OMEGA

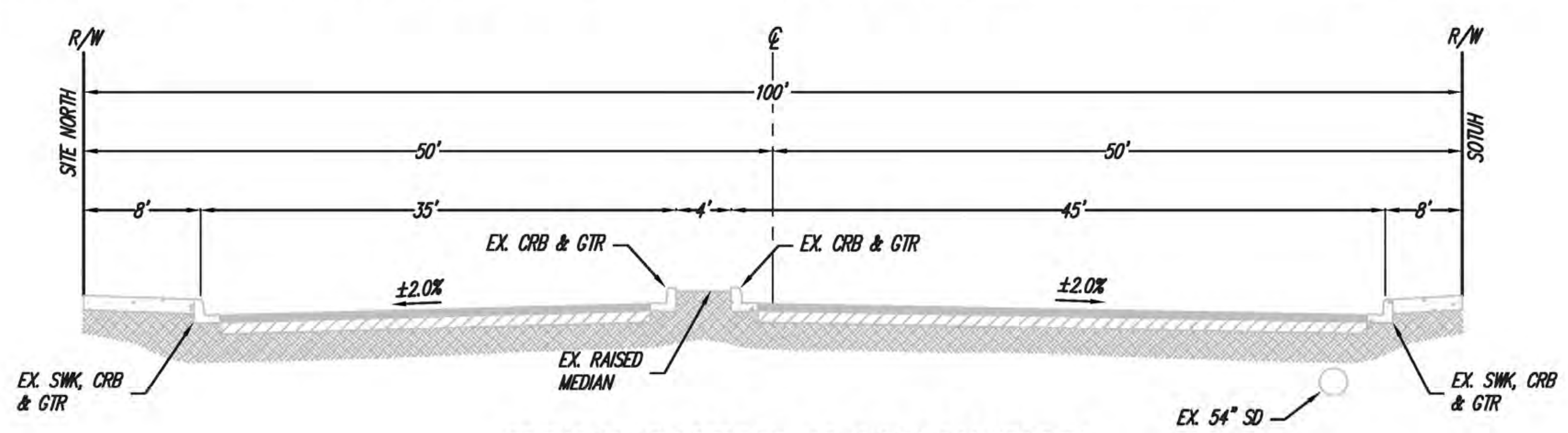
PROP. HYDROLOGY EXHIBIT





TYPICAL SECTION - S. PERRY STREET

NOT TO SCALE



TYPICAL SECTION - E. CARSON STEET

NOT TO SCALE

EXISTING LEGEND:

ITEM	SYMBOL
PROPERTY LINE	
CENTERLINE	
RIGHT-OF-WAY	
EASEMENT	
EX. CONTOUR	552
EX. CURB & GUTTER	

OWNER:

RECREATION ROAD LLC

SITE ADDRESS:

21611 SOUTH PERRY STREET
CARSON, CA 90745

ASSESSOR'S PARCEL NUMBER:

7327-010-014 & 7327-010-015

TITLE INFORMATION:

TITLE INFORMATION FOR THIS SURVEY BASED ON A PRELIMINARY REPORT PREPARED BY COMMONWEALTH LAND TITLE INSURANCE COMPANY AS ORDER NO. 09174014-917-EGL, DATED: AUGUST 4, 2020.

LEGAL DESCRIPTION:

THAT PORTION OF LOT 15 OF TRACT NO. 4054, IN THE CITY OF CARSON, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 44, PAGES 39 THROUGH 41 INCLUSIVE OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE NORTHERLY LINE OF THE SOUTHERLY 20 FEET OF SAID LOT WITH A LINE PARALLEL WITH AND NORTHEASTERLY 27 FEET, MEASURED AT RIGHT ANGLES, FROM THE SOUTHWESTERLY LINE OF SAID LOT; THENCE ALONG SAID PARALLEL LINE NORTH 39°21'48" WEST 245.64 FEET; THENCE SOUTH 89°22'27" WEST 25.48 FEET; THENCE NORTH 39°21'48" WEST 2.11 FEET; THENCE NORTH 00°37'33" WEST 17.38 FEET TO A LINE PARALLEL WITH AND NORTHEASTERLY 18 FEET, MEASURED AT RIGHT ANGLES, FROM SAID SOUTHWESTERLY LINE; THENCE ALONG SAID LAST MENTIONED PARALLEL LINE NORTH 39°21'48" WEST TO THE SOUTHERLY LINE OF TRACT NO. 29360, AS PER MAP RECORDED IN BOOK 734, PAGES 45 AND 46 OF MAPS; THENCE EASTERLY ALONG SAID SOUTHERLY LINE TO THE EASTERLY LINE OF SAID LOT 15; THENCE SOUTHERLY ALONG SAID EASTERLY LINE TO SAID NORTHERLY LINE; THENCE WESTERLY ALONG SAID NORTHERLY LINE TO THE POINT OF BEGINNING.

EXCEPT THEREFROM THAT PORTION OF SAID LAND DESIGNATED AS PARCELS 2-36 INCLUSIVE IN THE FINAL DECREE OF CONDEMNATION ENTERED IN SUPERIOR COURT, LOS ANGELES COUNTY, CASE NO. 909,461, A CERTIFIED COPY OF WHICH WAS RECORDED AUGUST 26, 1969 AS INSTRUMENT NO. 2734, IN BOOK D-4478, PAGE 350 OF OFFICIAL RECORDS OF SAID COUNTY AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE EASTERLY LINE OF SAID LOT WITH THE NORTHERLY LINE OF THE SOUTHERLY 20 FEET OF SAID LOT; THENCE WESTERLY ALONG SAID NORTHERLY LINE 19.99 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE NORTHWEST, HAVING A RADIUS OF 15 FEET, TANGENT TO SAID NORTHERLY LINE AND TANGENT TO THE WESTERLY LINE OF THE EASTERLY 5 FEET OF SAID LOT; THENCE NORTHEASTERLY ALONG SAID CURVE 23.55 FEET TO SAID WESTERLY LINE; THENCE EASTERLY AT RIGHT ANGLES FROM SAID WESTERLY LINE 5 FEET TO SAID EASTERLY LINE; THENCE SOUTHERLY ALONG SAID EASTERLY LINE 14.99 FEET TO THE POINT OF BEGINNING.

VERTICAL BENCHMARK:

DESCRIPTION: LOS ANGELES COUNTY PUBLIC WORKS BENCHMARK NUMBER "Y 10545" IN TOP OF CURB ON SOUTH SIDE OF E 213TH STREET APPROXIMATELY 40 FEET WEST OF THE CENTERLINE OF PERRY STREET (APPROXIMATELY 1,010' NORTH OF SITE)

ELEVATION: 18.248' (NAVD88)

SOURCE OF TOPOGRAPHY:

TOPOGRAPHY SHOWN HEREON IS BASED ON AERIAL PHOTOGRAMMETRIC MAPPING CONDUCTED BY PRECISION UAV. HORIZONTAL AND VERTICAL GROUND CONTROL WERE ESTABLISHED BY OMEGA LAND SURVEYING, INC. ON FEBRUARY 01, 2021 WITH SUPPLEMENTAL DATA COLLECTED ON FEBRUARY 03, 2021.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CENTERLINE OF PERRY STREET AS SHOWN ON SUBDIVISION MAP FOR TRACT NO. 29360 FILED IN BOOK 734, PAGE 46-47, OF MAP RECORDS, SAID BEARING BEING "N 00°17" W".

AREA SUMMARY:

TOTAL PARCEL AREA (NET)	110,643	SF
TOTAL PARCEL AREA (GROSS)	112,119	SF

GRADING INFORMATION:

CUT (TO FINISH SURFACE)	357	CY
FILL (TO FINISH SURFACE)	4,199	CY
UNDERCUTS	4,281	CY
REMEDIAL GRADING	15,037	CY
EXPORT (IMBALANCE)	725	CY

EASEMENTS:

4 POLE LINE EASEMENT RECORDED JUNE 7, 1962, AS RECORD NO. 6424 IN BOOK D1640, PAGE 796 OF OFFICIAL RECORDS.

5 PUBLIC ROAD AND HIGHWAY EASEMENT RECORDED DECEMBER 19, 1967, AS RECORD NO. 2944 OF OFFICIAL RECORDS.

7 PUBLIC STREET OR HIGHWAY EASEMENT RECORDED NOVEMBER 4, 1975, AS RECORD NO. 3450 OF OFFICIAL RECORDS.

PLAN PREPARED BY:
OMEGA
ENGINEERING CONSULTANTS
4340 VIEWRIDGE AVE. SUITE B
SAN DIEGO, CA 92123
PH:(858) 634-8620 FAX:(858)-634-8627

REGISTERED PROFESSIONAL ENGINEER
SEAN M. SAVAGE
No. 75677
CIVIL
STATE OF CALIFORNIA

FOR PLAN CHECK ONLY

SEAN M. SAVAGE R.C.E. 75677 DATE

PERRY STREET
CARSON STREET SS
CARSON, CA

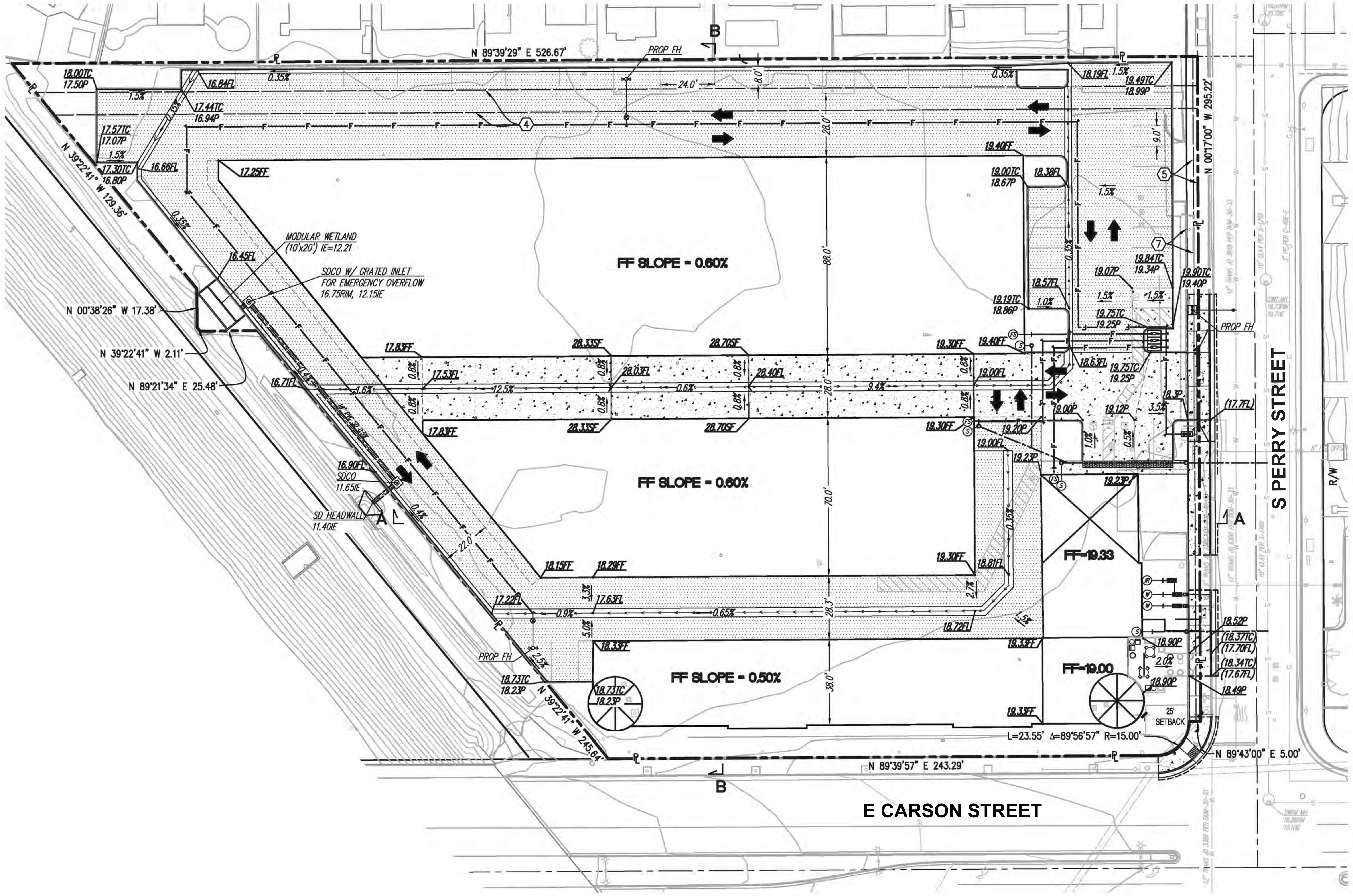
JOB NUMBER: 20-817

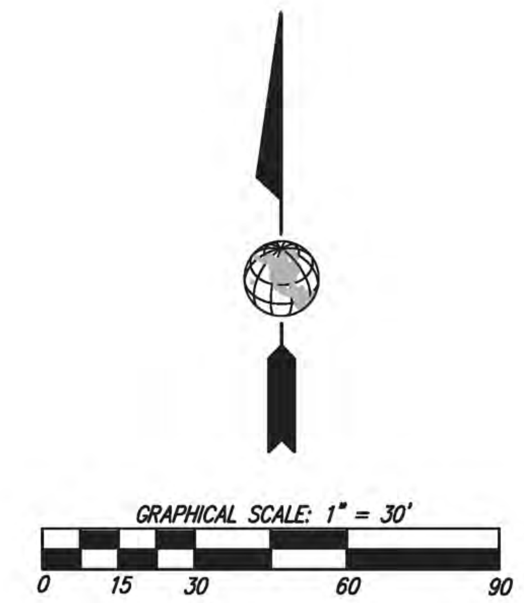
DATE: 10/05/2021

J.ORDAN
ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090

FILENAME: P:\DWG OMEGA\0633 FARING SS CARSON\ACAD\DISCRETIONARY\0633-CSP-01-CONSTRAINTS.DWG DATE: 10/5/2021 11:20:02 AM

PRELIMINARY GRADING PLAN





PLAN PREPARED BY:

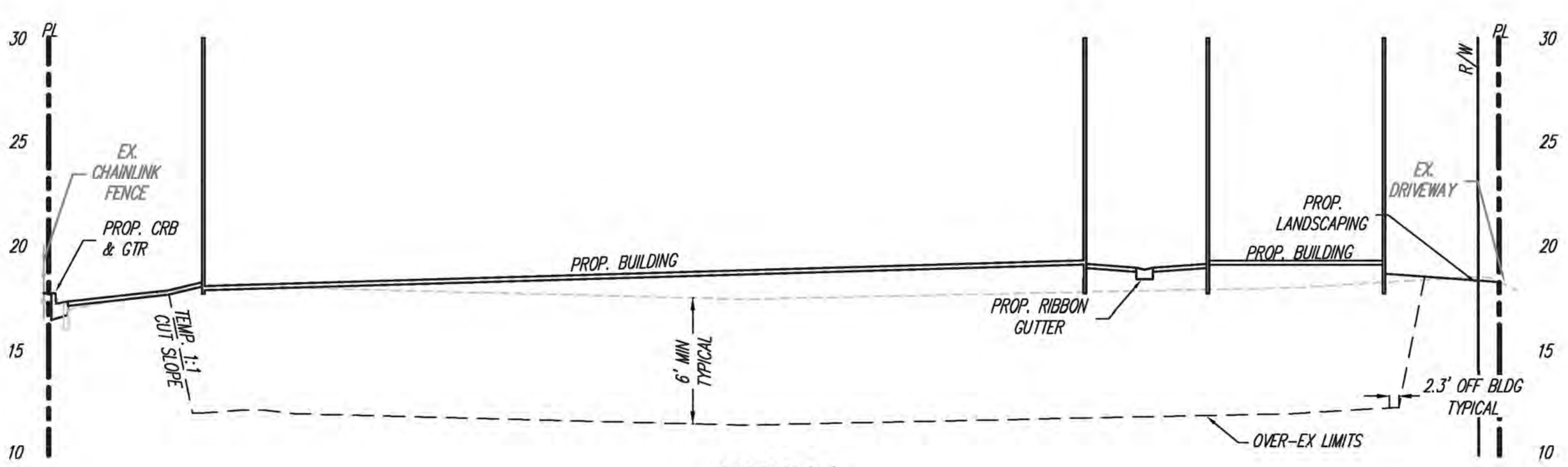
OMEGA
ENGINEERING CONSULTANTS
4340 VIEWRIDGE AVE. SUITE B
SAN DIEGO, CA 92123
PH:(858) 634-8620 FAX:(858)-634-8627

EXISTING LEGEND

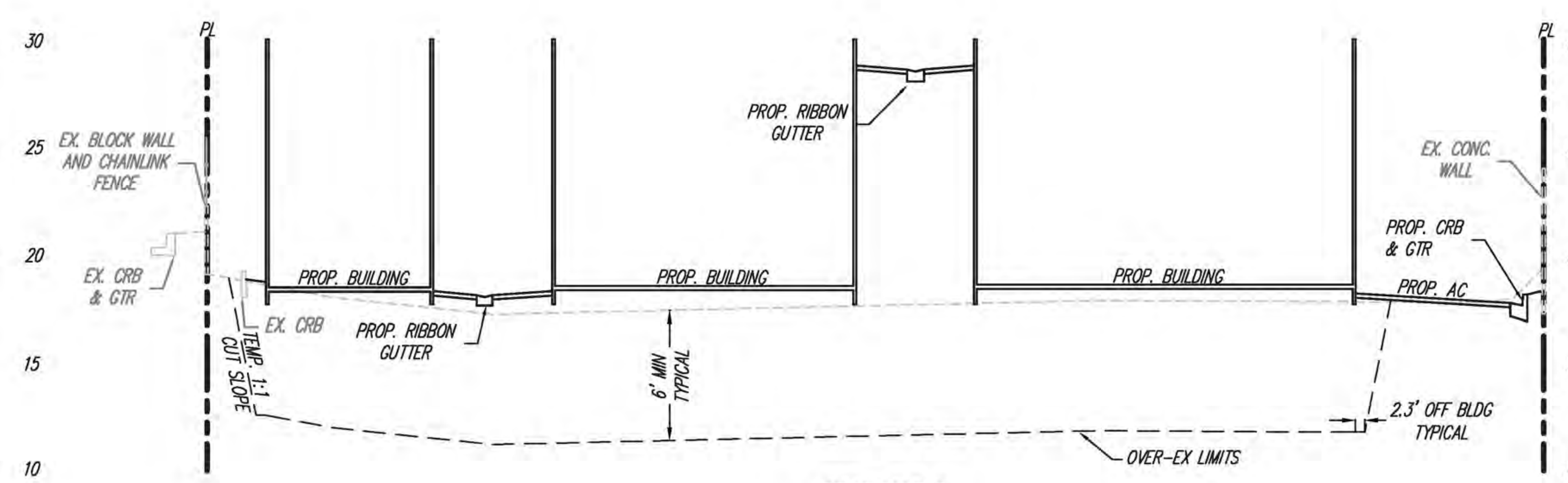
ITEM	SYMBOL
PROPERTY LINE	
CENTERLINE	
RIGHT-OF-WAY	
EX. CONTOUR	552
EX. CURB & GUTTER	

PROPOSED LEGEND

ITEM	SYMBOL
PROPOSED GRADE BREAK	
PROPOSED FINISH FLOOR SLOPE	FF SLOPE =0.5%
PROPOSED FINISH FLOOR ELEVATION	374.00FF
PROPOSED PAVEMENT ELEVATION	374.00P
PROPOSED FLOWLINE ELEVATION	374.00FL
PROPOSED GRADIANT	1.1%
PROPOSED 6" PCC CURB	
PROPOSED 6" PCC CURB & GUTTER	
PROPOSED FLOW LINE	
PROPOSED BUILDING	
PROPOSED PARKING STALL STRIPING	
PROPOSED HANDICAP STRIPING	
PROPOSED PVT. STORM DRAIN (SIZE PER PLAN)	
PROPOSED PVT. FIRE SERVICE LATERAL	
PROPOSED PVT. SEWER LATERAL	
PROPOSED SEWER POINT OF CONNECTION	
PROPOSED FIRE POINT OF CONNECTION	
PROPOSED FIRE SERVICE BACKFLOW	
PROPOSED FDC/PIV	
PROPOSED FIRE HYDRANT	
PROPOSED PVT. STORM DRAIN CLEAN OUT/CONNECTION (SIZE AND TYPE PER PLAN)	
PROPOSED PVT. PCC PAVEMENT WALK	
PROPOSED PVT. ADA RAMP	
PROPOSED PVT. AC PAVEMENT HEAVY DRIVE AISLE	
PROPOSED PVT. MODULAR WETLAND	



SECTION A-A
HORIZONTAL SCALE 1"=30'
VERTICAL SCALE 1"=4'



SECTION B-B
HORIZONTAL SCALE 1"=30'
VERTICAL SCALE 1"=4'

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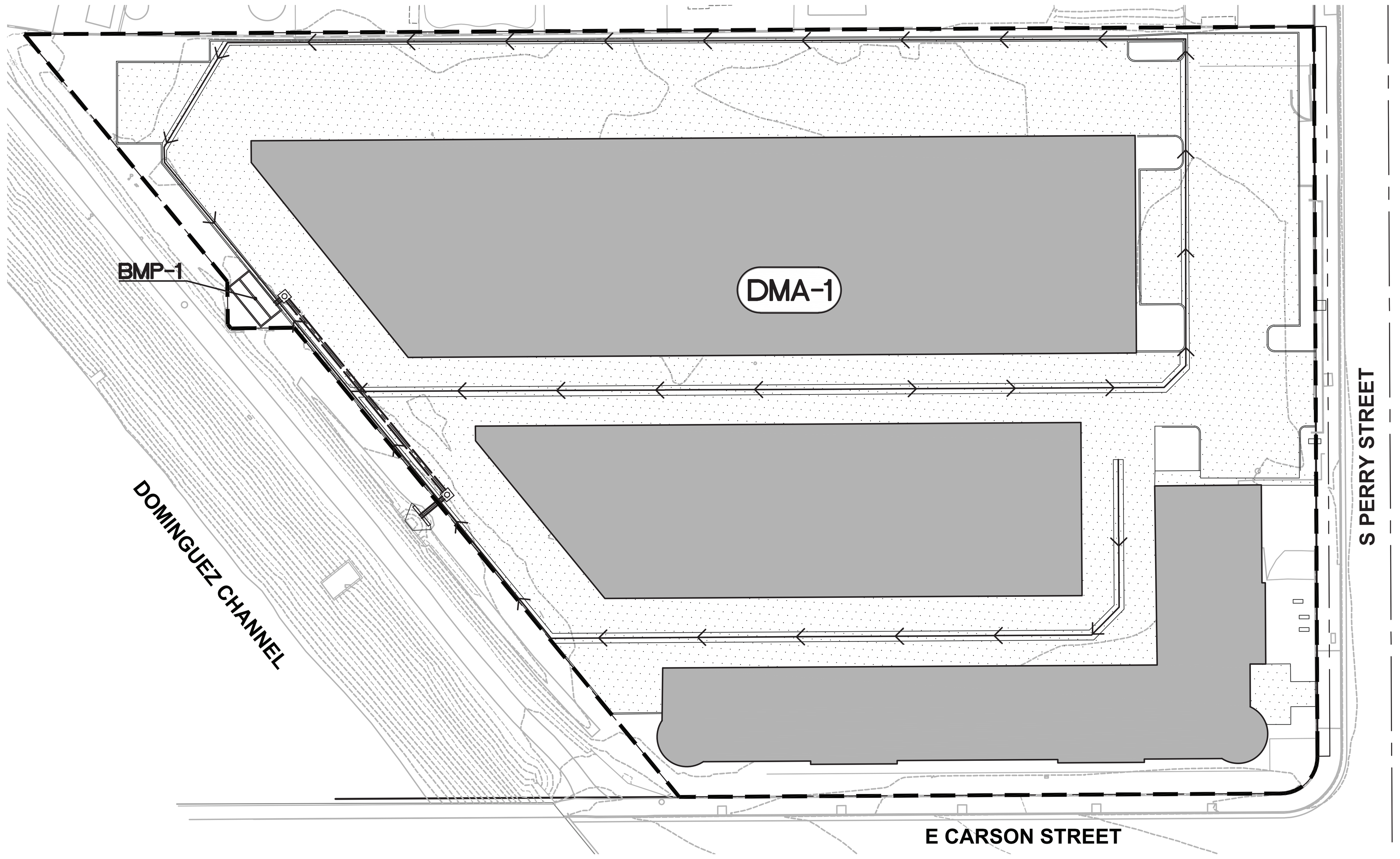
PERRY STREET
CARSON STREET SS
CARSON, CA

REGISTERED PROFESSIONAL ENGINEER SEAN M. SAVAGE No.75677 CIVIL STATE OF CALIFORNIA

FOR PLAN CHECK ONLY
SEAN M. SAVAGE R.C.E. 75677 DATE

JOB NUMBER: 20-817
DATE: 10/05/2021

JORDAN ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090



LEGEND

AREA LIMITS	
FLOW ARROWS	
BUILDING AREA	
PAVEMENT AREA	
DRAINAGE MGMT AREA (DMA) NUMBER	DMA-1

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DMA DATA TABLE

DMA-NO.	TOT. AREA (SF)	IMPERVIOUS (%)	REQ'D FLOWRATE (CFS)	BMP FLOWRATE (CFS)	TYPE/TREATED BY
DMA-1	120,644	89.8	0.702	0.710	BMP-1/MODULAR WETLAND

GENERAL STORM WATER NOTES

1. GROUNDWATER IS ANTICIPATED AT APPROXIMATELY 12.5 FEET BELOW EXISTING GRADE ON SITE.
2. NO EXISTING NATURAL HYDROLOGIC FEATURES
3. NO SIGNIFICANT ECOLOGICAL AREAS ON SITE
4. ALL APPLICABLE SOURCE CONTROL BMPS SHALL BE IMPLEMENTED
   5A. SOURCE CONTROL NOTES TO COME IN MINISTERIAL REVIEW

Peak Flow Hydrologic Analysis

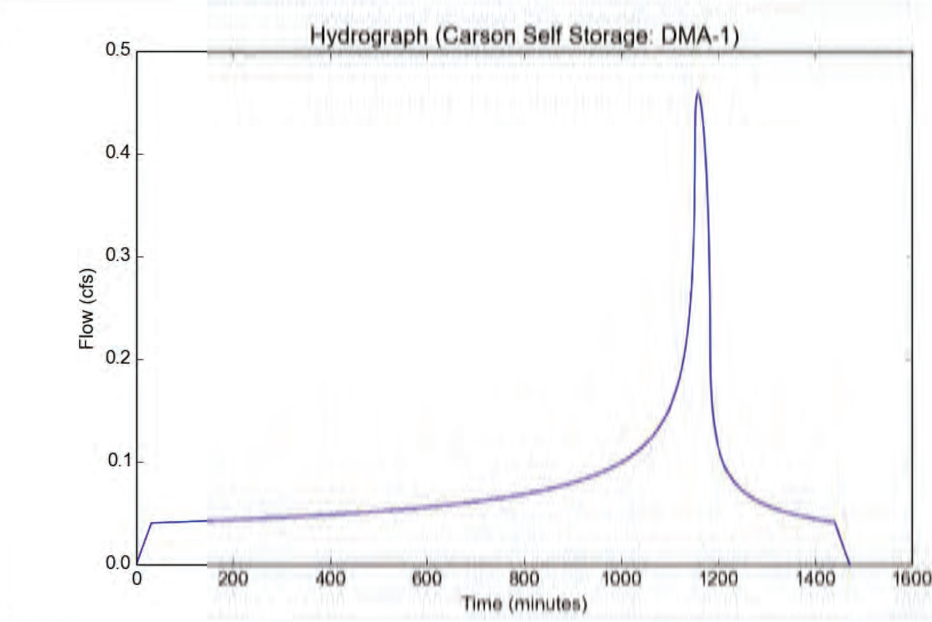
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/Water Quality/ATTACHMENTS/85th Percentile Hydro
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self Storage
Subarea ID	DMA-1
Area (ac)	2.77
Flow Path Length (ft)	475.0
Flow Path Slope (vft/hft)	0.006
85th Percentile Rainfall Depth (in)	0.8
Percent Impervious	0.898
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.8
Peak Intensity (in/hr)	0.2025
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8184
Time of Concentration (min)	31.0
Clear Peak Flow Rate (cfs)	0.459
Burned Peak Flow Rate (cfs)	0.459
24-Hr Clear Runoff Volume (ac-ft)	0.1499
24-Hr Clear Runoff Volume (cu-ft)	6528.9479



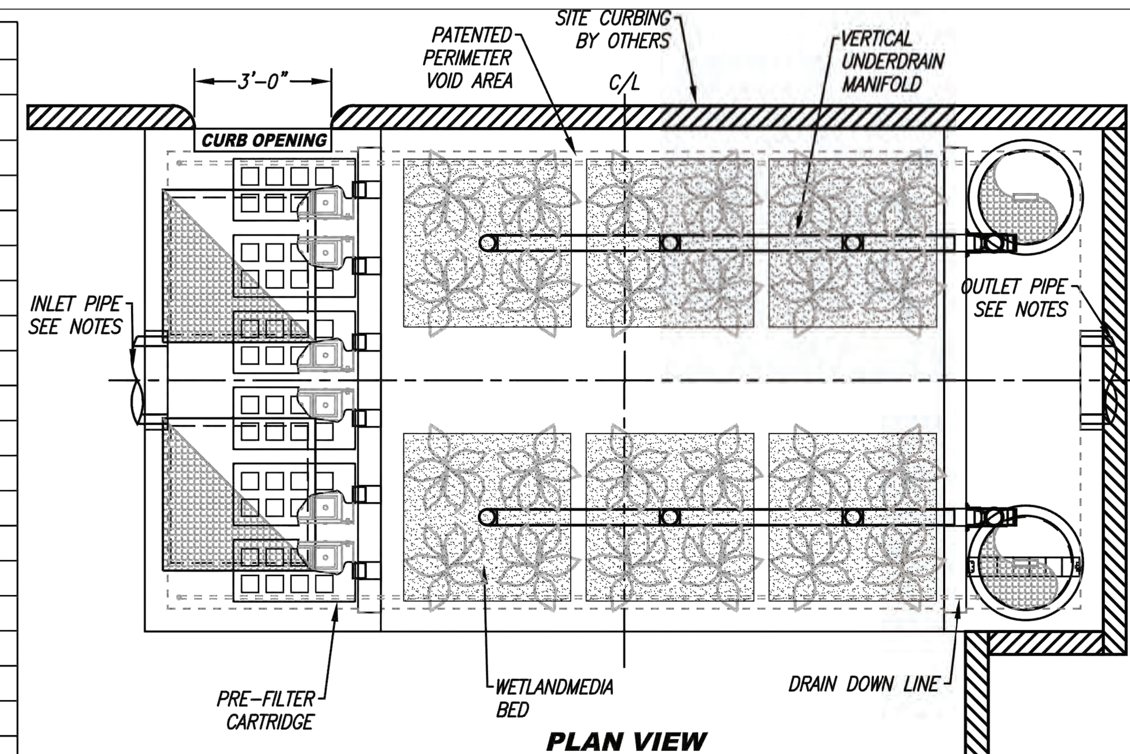
PROJECT HYDROGRAPH

GRAPHICAL SCALE: 1" = 40'
0 20 40 80 120

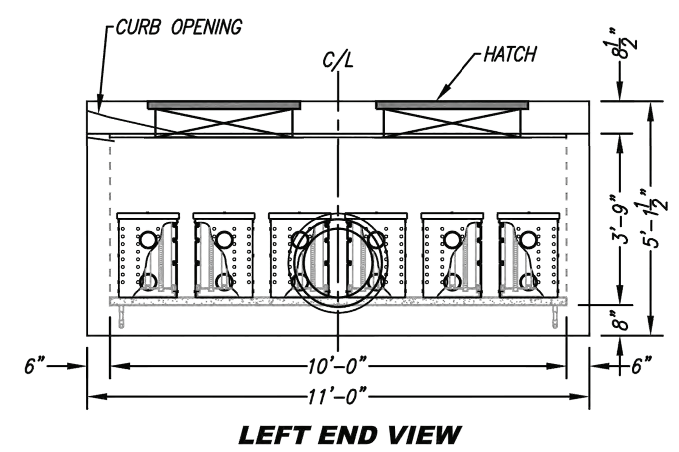
SITE SPECIFIC DATA

PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.710	
TREATMENT HGL AVAILABLE (FT)			N/K
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			FLOW BY
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	2 EA 36" X 36"	N/A	2 EA ø24"
WETLANDMEDIA VOLUME (CY)			
ORIFICE SIZE (DIA. INCHES)			2 EA ø2.67"

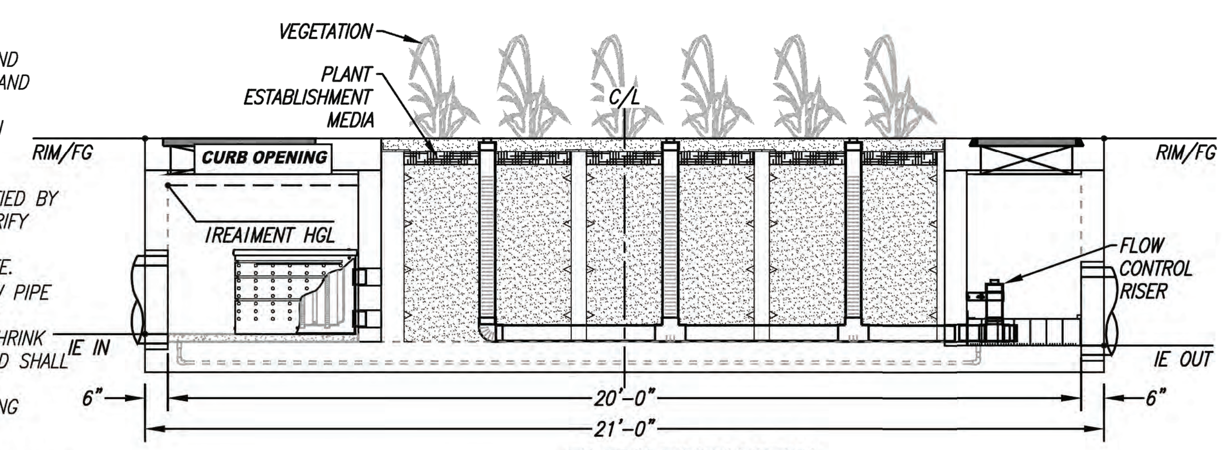
NOTES: PRELIMINARY. NOT FOR CONSTRUCTION.



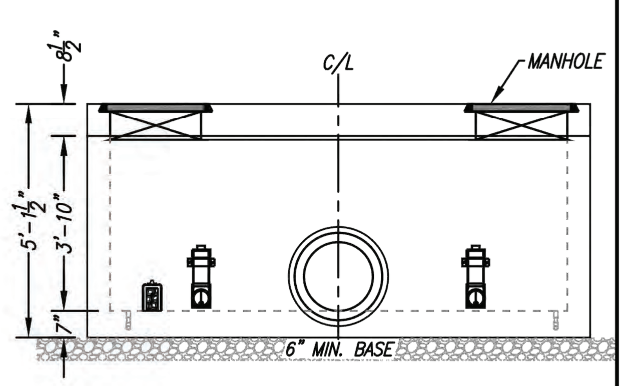
PLAN VIEW



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 MANUFACTURERS 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 TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. 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 GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING MODULAR WETLANDS FOR ACTIVATION OF UNIT. MANUFACTURES WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A MODULAR WETLANDS 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 MANUFACTURER.

LOW INFLOW PIPE DISCLOSURE:

IT IS RECOMMENDED THAT A SUFFICIENT VARIATION IN ELEVATION BETWEEN THE INLET AND OUTLET BE PROVIDED TO ALLOW FOR ACCUMULATION OF SEDIMENT IN THE PRE-TREATMENT CHAMBER. FAILURE TO DO SO MAY RESULT IN BLOCKAGE AT INFLOW POINT(S) WHICH MAY CAUSE UPSTREAM FLOODING.

TREATMENT FLOW (CFS)	0.710
OPERATING HEAD (FT)	3.5
PRETREATMENT LOADING RATE (GPM/SF)	2.1
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MWS-L-10-20-4'-5.5"-C-HC
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

MODULAR WETLAND DETAIL
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
SEAN M. SAVAGE
No.75677
CIVIL
STATE OF CALIFORNIA

FOR PLAN CHECK ONLY
SEAN M. SAVAGE R.C.E. 75677
DATE

PERRY STREET
CARSON STREET SS
CARSON, CA

JOB NUMBER: 20-817
DATE: 10/05/2021

JORDAN ARCHITECTS
131 CALLE IGLESIA, SUITE 100
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949.388.8090

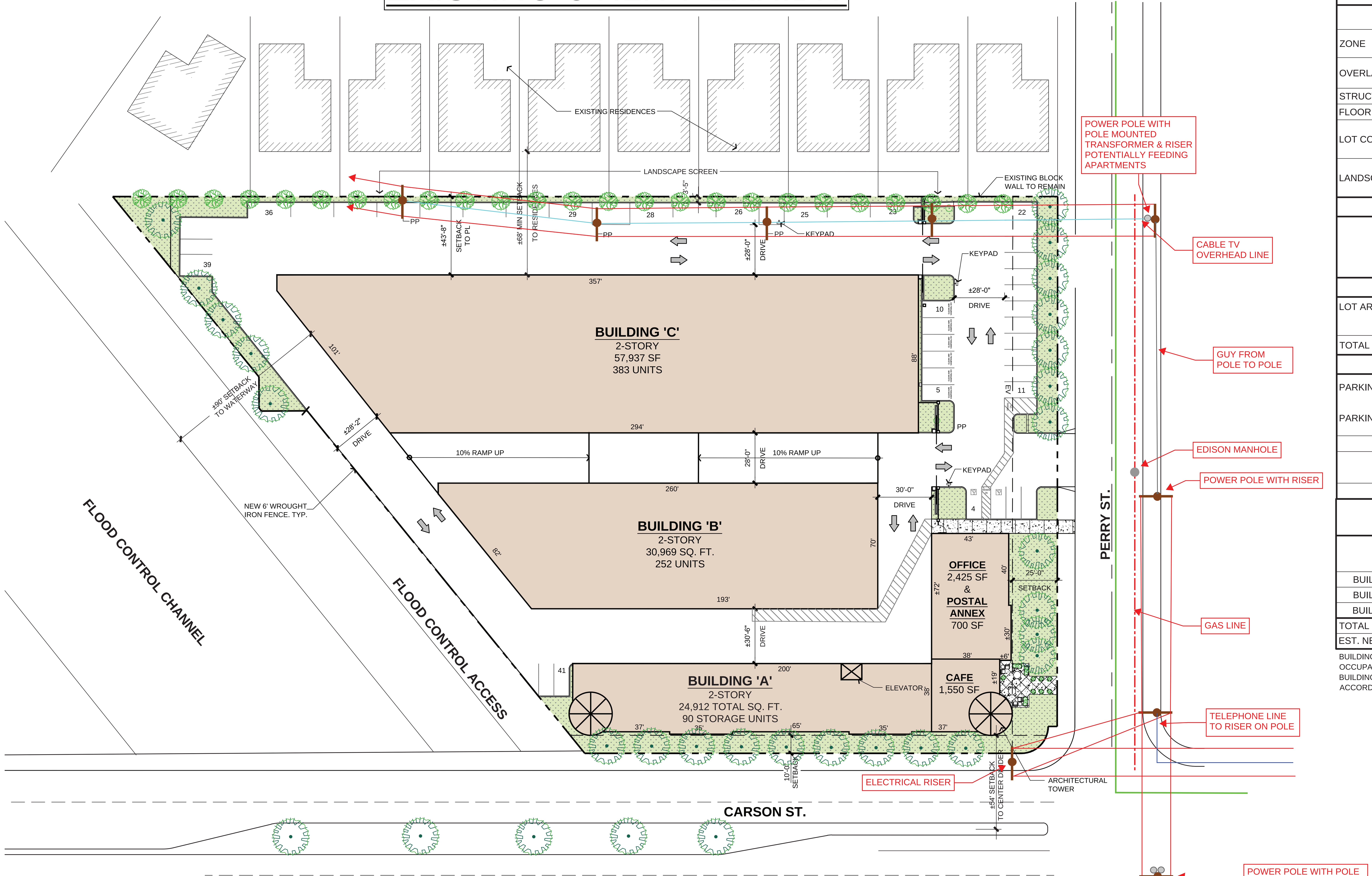
FILENAME: P:\DWG OMEGA\0633 FARING SS CARSON\ACAD\DISCRETIONARY\0633-CSP-03-DMA.DWG
DATE: 5/14/2021 11:41:32 AM

PERRY STREET SPECIFIC PLAN
Fig. 6

Note: Utilize existing 60" RCP storm drainlocated at Sta.351+25.00 to discharge into Dominguez Channel.

PERRY STREET SPECIFIC PLAN
Fig. 7

EXISTING UTILITY EXHIBIT



BASIS OF DESIGN	REQUIRED / EXISTING	PROVIDED / PROPOSED
ZONE	ML - MANUFACTURING, LIGHT	TBD
OVERLAY	D OVERLAY	
STRUCTURE HEIGHT	N/A	TBD
FLOOR AREA RATIO	.5 (GP)	.99 (118,928)
LOT COVERAGE	-	46.6% (56,906 S.F.)
LANDSCAPE	-	±23,000 S.F. (18.8%) LANDSCAPE AREA
SETBACKS		
FRONT	25'	25 FT. MIN.
STREET SIDE	10 FT.	10 FT. MIN
REAR (RESIDENTIAL)	10 FT.	40 FT. MIN
INTERIOR SIDE	10 FT.	28' FT. MIN.
SITE DATA		
LOT AREA	121,968	SQ. FT.
	2.8	ACRES
TOTAL GROSS BLDG. AREA	113,805	SQ. FT.
PARKING		
PARKING SPACES	1 SPACE PER 20 UNITS 725/20 = ±36 STALLS	41 SPACE
PARKING SIZE	STANDARD: 8.5' X 18' PARALLEL: 8' X 24'	STANDARD: 8.5' X 18' PARALLEL: 8' X 24'
PARKING PROVIDED		
STANDARDS	39	
ACCESSIBLE	2	
TOTAL	41	

BUILDING AREA TABULATIONS (Square Feet)

	SELF STORAGE	OFFICE/POSTAL ANNEX/CAFE	TOTAL
BUILDING A 2-STORY	20,133	4,675	24,808
BUILDING B 2-STORY	30,969		30,969
BUILDING C 2-STORY	57,937		57,937
TOTAL AREA:	109,039	4,675	113,714
EST. NET STORAGE AREA = 81,840 S.F.			

BUILDING CONSTRUCTION TYPE: IIB
OCCUPANCY CLASSIFICATION: S-1. TOP STORAGE IN NOT GRATER THAN 8'
BUILDINGS ARE EQUIPPED WITH AUTOMATIC FIRE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13.

NORTH

LEGEND
- ELECTRIC
- CATV
- TEL
- GAS

PERRY STREET STORAGE
CARSON, CA

SCHEME I
PRELIM. SITE PLAN

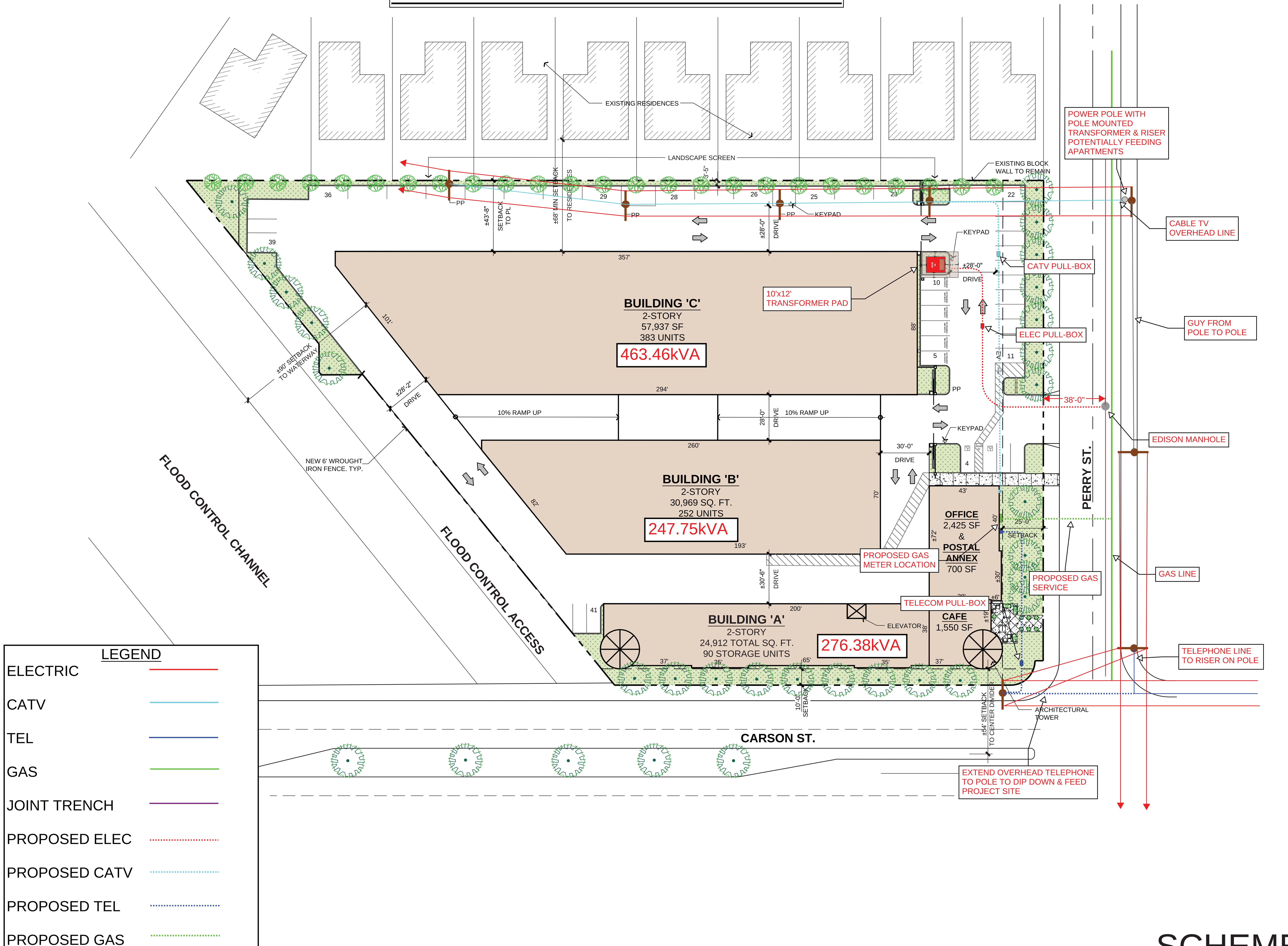
JOB NUMBER: 20-817
SCALE: 1"=30'-0"
DATE: 12/16/2021

JORDAN ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090

SHEET A1

PERRY STREET SPECIFIC PLAN
Fig. 8

PROPOSED UTILITY EXHIBIT



BASIS OF DESIGN		
	REQUIRED / EXISTING	PROVIDED / PROPOSED
ZONE	ML - MANUFACTURING, LIGHT	TBD
OVERLAY	D OVERLAY	
STRUCTURE HEIGHT	N/A	TBD
FLOOR AREA RATIO	.5 (GP)	.99 (118,928)
LOT COVERAGE	-	46.6% (56,906 S.F.)
LANDSCAPE	-	±23,000 S.F. (18.8%) LANDSCAPE AREA
SETBACKS		
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STREET SIDE	10 FT.	10 FT. MIN
REAR (RESIDENTIAL)	10 FT.	40 FT. MIN
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TOTAL GROSS BLDG. AREA	113,805	SQ. FT.
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NORTH

PERRY STREET STORAGE

CARSON, CA

SCHEME I

PRELIM. SITE PLAN

JOB NUMBER: 20-817
SCALE: 1"=30'-0"
DATE: 12/16/2021

JORDAN ARCHITECTS
131 CALLE IGLESIA, SUITE 100
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SHEET A1

Carson Self-Storage
Preliminary Utilities Technical Memorandum

21611 South Perry St.
Carson, CA 90745

Date Prepared:
March 9, 2022

Prepared for:
21611 Perry Street, LLC
4132 Katella Avenue, #205B
Los Alamitos, CA 90720

Prepared By:

OMEGA ENGINEERING CONSULTANTS
4340 Viewridge Ave, Suite B
San Diego, CA 92113
Ph: (858) 634-8620

Table of Contents

1.0 OVERVIEW

The Carson Self-Storage project, herein known as the Project, involves the development of multiple self-storage buildings with a café, and office space on the 2.80-acre site. The Project site currently consists of a vacant lot that was previously occupied by an 60,000 SF industrial building until approximately 2009. The development site is located at 21611 S. Perry Street and is bounded by E. Carson Street to the south, Dominguez Channel to the west, single-family residences to the north, and commercial and residential properties to the east.

2.0 SCOPE OF ANALYSIS

This analysis provides supporting information for the Project's environmental review pursuant to the California Environmental Quality Act (CEQA) and documents research regarding existing and proposed utility infrastructure for the Project. Both the existing conditions and previous development condition shave been analyzed.

3.0 EXISTING UTILITES AND REGULATORY FRAMEWORK

3.1 Existing Utility Providers

The following is a list of existing utilities and their service providers that are within the proximity of the Project Site.

- Storm Drain – Los Angeles County Flood Control District
- Sanitary Sewer – Los Angeles County Department of Public Works
- Water – California Water Service Company
- Electricity – Southern California Edison
- Natural Gas – Southern California Gas Company
- Telecommunications –
    - AT&T Distribution South
    - Charter Communications

3.2 Regulatory Framework

3.2.1 Water

The California Water Service Company is responsible for providing water supply to the City of Carson while complying with Local, State, and Federal regulations.

The proposed project does not meet or exceed the below specified thresholds requiring a WSA from California Water Service Company.

Below are the State and Regional water supply regulations:

California Code of Regulations, Title 20, Chapter 4, Article 4, Section 1605 establishes water efficiency standards for all new plumbing fixtures and Section 1608 prohibits the sale of fixtures that do not comply with the regulations.

2016 California Green Building Standards Code, CCR, Title 24, Part 11 (CALGreen), adopted on January 1, 2016, requires a water use reduction of 20 percent below the baseline cited in the CALGreen code book. The code applies to family homes, state buildings, health facilities, and commercial buildings.

California Urban Water Management Planning Act of 1984 requires water suppliers to adopt an Urban Water Management Plan (UWMP).

Metropolitan Water District (MWD) official reports and policies as outlined in its Regional UWMP, Water Surplus and Drought Management Plan, Water Supply Allocation Plan, and Integrated Resources Plan.

Los Angeles County Public Works' 2015 UWMP outlines the County's long-term water resources management strategy. The 2015 UWMP was approved by June 3, 2016.

Senate Bill 610, approved on October 9, 2001, requires land use agencies to perform a detailed analysis of available water supply when approving large developments. Historically, public water suppliers (PWS) simply provided a "will serve" letter to developers. For certain projects subject to CEQA review, SB 610 requires that urban water suppliers prepare a WSA to determine whether the project water demand is included as part of the most recently adopted UWMP. All projects that meet any of the following criteria require a WSA:

- A proposed residential development of more than 500 dwelling units.
- A proposed shopping center or business establishment of more than 500,000 square feet of floor space or employing more than 1,000 persons
- A proposed commercial office building of more than 250,000 square feet of floor space or employing more than 1,000 persons
- A proposed hotel or motel of more than 500 rooms
- A proposed industrial, manufacturing, or processing plant or industrial park of more than 40 acres of land, more than 650,000 square feet of floor area, or employing more than 1,000 persons
- A mixed-use project that falls in one or more of the above-identified categories
- A project not falling in one of the above-identified categories but that would demand water equal or greater than the amount required by a 500-dwelling unit project.

3.2.2 Sewer

The County of Los Angeles includes regulations that allow the County to assure available sewer capacity for new projects and fees for improvements to the infrastructure system. The County requires that the applicant perform a sewer area study when any person seeks a sewer permit to connect a property to the County's sewer collection system, proposes additional discharge through their existing public sewer connection, or proposes a future sewer connection or future development. A sewer area study is an analysis of the existing sewer collection system to determine if there is adequate capacity existing in the sewer collection system to safely convey the newly generated sewage to the appropriate sewage treatment plant. The net increase in daily water demand is so small a sewer study should not be necessary.

The County of Los Angeles establishes design criteria for sewer systems to assure that new infrastructure provides sewer capacity and operating characteristics to meet standard practice for sewer design. Per County regulations, sewers will be designed so that the peak dry weather flow depth during their planning period shall not exceed one-half the pipe diameter.

3.2.3 Electricity

Title 24 of the California Code of Regulations regulates energy consumption in new construction. The standards regulate energy consumed in buildings for heating, cooling, ventilation and lighting. Title 24 is implemented through the local plan check and permit process. The current (2016) standards effective date is January 1, 2017 and it applies for new construction of both residential and non-residential buildings.

3.2.4 Natural Gas

As a public utility, the Southern California Gas Company (the Gas Co.) is under jurisdiction of the California Public Utilities Commission. As mentioned in section 3.2.3, Title 24 of the California Code of Regulations regulates energy consumption in new constructions. The standards regulate energy consumed in buildings for heating, cooling, ventilation and lighting. Title 24 is implemented through the local plan check and permit process. The Gas Co.'s 2018 Gas Report that commercial and industrial demand is expected to increase at an annual rate of 0.2 percent. This is mainly due to increased efficiency of power plants and the statewide efforts to use renewable sources of energy for electricity generation.

3.2.5 Telecommunications

As a private utility, telecommunications service providers operate jurisdiction of the California Public Utilities Commission. As mentioned in section 3.2.3, Title 24 of the California Code of Regulations regulates energy consumption in new constructions. The standards regulate energy consumed in buildings for heating, cooling, ventilation and lighting. Title 24 is implemented through the local plan check and permit process.

4.0 WATER

4.1 Existing Condition

Both the existing conditions and previous development conditions have been analyzed. California Water Service owns and operates a 12” water main in the east side of S Perry Street and a 12” branch off the main even further in the east side of S Perry Street, adjacent to the project. There is one fire hydrant on the east side of S Perry Street, adjacent to the project site. The previous condition of the currently vacant site was a 60,000 SF industrial building that covered most of the site and a parking lot. This information and historic data obtained from California Water Service Company was used to determine the existing site water usage.

4.2 Proposed Condition

The proposed project includes 3-Self Storage Buildings, a small café, & a small office space. Only the café & office space will contribute to the water demand, as the self-storage buildings will not contain and water fixtures.

Estimated Project Water Demand

Proposed Use	Average Generation Factor[(a)]	Square Footage	Average Daily Water Demand (GPD)	Estimated Water Use (AFY) 2045-Ultimate Condition
Café/Commercial	0.28 GPD/SQFT	4,675 SQFT	1,309	1.5
Landscaping/ Open Space	-	12,134 SQFT	254	0.29
System Water Losses (3.4%)			53	0.06
Existing Site Use	0	0	0	0
Previous Site Use	(*)	60,000	-3,740	-4.2
Proposed Total Demand	-	-	-2,137	1.85

a) All flows were calculated using historical data for the Dominguez District, as provided in the Cal Water WSA Water Factor Tool.
b) Estimates of landscape irrigation are based on MWELO ETWU calculations provided by Cal Water. Landscape irrigation estimates include all irrigated areas including public open space and private yards.

Domestic water is expected to be the main contributor of water consumption for the Project. The total water demand for the Project is conservatively estimated at 1.85 AFY at buildout. This culminates in a net 2.35 AFY decrease in water use when compared to the former industrial building, but an increase in water use when compared to current vacant condition. Fire water demands will create a greater immediate need on the water network, and therefore are the primary means for analyzing infrastructure capacity. A regional Fire Hydrant Flow Test has been received from California Water to confirm the pressure from the existing fire hydrant.

Due to size and area of the Project, LACFD will require onsite fire hydrants. Omega is coordinating with California Water Service Company and County of Los Angeles Fire Department to submit a Fire Hydrant Flow Test form for confirmation. The hydrant tested is on the west side of S Perry Street, within immediate vicinity of the Project site. The flow test demonstrated that the hydrant is capable of 4,144 gallons per minute.

4.3 Significance Thresholds – Water

In accordance with the State CEQA Guidelines Appendix G (Appendix G), the Project would have a significant impact related to water supply and infrastructure if it would:

- Require or result in the relocation or construction of new or expanded water facilities, the construction or relocation of which could cause significant environmental effects
- [Not] have enough water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years

The L.A. County CEQA Thresholds Guide identifies the following criteria to evaluate water supply and infrastructure:

- The total estimated water demand for the project;
- Whether enough capacity exists in the water infrastructure that would serve the project, taking into account the anticipated conditions at project buildout;
- The amount by which the project would cause the projected growth in population, housing or employment for the Community Plan area to be exceeded in the year of the project completion; and
- The degree to which scheduled water infrastructure improvements or project design features would reduce or offset service impacts.

In assessing impacts related to water supply and infrastructure, the County will use Appendix G as the thresholds of significance. The criteria identified above from the L.A. County CEQA Thresholds Guide will be used where applicable and relevant to assist in analyzing the Appendix G thresholds.

4.4 Project Impacts

The project will require the construction of new, water facilities to serve the new buildings. Construction impacts associated with the installation of water distribution lines would primarily involve trenching to place the water distribution lines below surface and would be limited to on-site water distribution, and minor off-site work associated with lateral connections to the public main. Prior to ground disturbance, Project contractors would coordinate with California Water Service Company to identify the locations and depths of all lines. Additionally, County of Los Angeles and California Water Service Company would be notified in advance of proposed ground disturbance activities to avoid water lines and disruption of water service. Therefore, Project impacts on water infrastructure associated with construction activities would be less than significant.

According to the 2019 California Fire Code Section 501.3, construction documents for proposed fire apparatus access, location of fire lanes, security gates across fire apparatus roads and construction documents and hydraulic calculations for fire hydrant systems shall be submitted to the fire department for review and approval prior to construction. Referencing the California Fire Code Appendix B (Table B105.1) and Appendix C (Table C105.1) Omega has estimated the minimum requirements are that:

- The water system must deliver 2,500 GPM at 20 psi for 2 hours.
- The spacing between fire hydrants does not exceed 450 feet via vehicular access.
- The distance of proposed buildings must be within 225 feet of a vehicular access roadway that is a minimum of 20 feet wide, paved with concrete or asphalt and does not exceed 15% grade.

Omega has corresponded with California Water Service Company and has received final receipt of the Fire Hydrant Flow Test form results that indicate the available pressure and capacity meet the proposed demands.

The total water demand for the Project is 1.83 AFY. Fire water demands will create a much greater immediate need on the water network than that of the Project's domestic uses, and therefore are the primary means for analyzing infrastructure capacity. All buildings will be sprinklered. However, water demands for the fire hydrants are fixed per a max flow allowed through the hydrant nozzle and building sprinkler demands will be less than the required 2,500 GPM for 2 hours. Cumulative demand from both the sprinkler system and fire hydrants flowing simultaneously will further reduce the pressure in the water system, the Fire Hydrant Flow Tests results have confirmed that available pressure and capacity meet the required 20 psi at the furthest hydrant.

5.0 SEWER

5.1 Existing Condition

Both the existing conditions and previous development conditions have been analyzed. The Project site is located within the Consolidated Sewer Maintenance District run by LACDPW. There is an existing 10" clay sewer main in the center of S Perry Street adjacent to the Project Site that is owned by LACDPW. The previous condition of the site was a 60,000 SF industrial building that covered most of the site and a parking lot. This information and the sewer generation factor for industrial buildings were used to generate the existing average daily water demand.

5.2 Proposed Condition

LACDPW's average wastewater generation factors were used to calculate the estimated demand of the proposed Project as follows:

Proposed Use	Average Generation Factor[a]	Proposed Number of Units	Average Daily Water Demand (GPD)
Office	200/1,000 GPD/SF	3,125 SF	625
Café/Restaurants	1,000/1,000 GPD/SF	1,550 SF	1,550
Storage	25/1,000 GPD/SF	109,039 SF	2,725
Proposed Total Demand	-	-	4,900
Proposed Total Demand With 2.5 Peaking Factor	-	-	12,250
Existing Condition	-	-	0
Previous Industrial	200/1,000 GPD/SF	60,000	-12,000

a) All flows were calculated using the County of Los Angeles sewer generation values. See appendix for entire sewer generation rates.

The proposed project will contribute 12,250 GPD or .02 cubic feet per second (cfs), when a peaking factor of 2.5 is factored in. This totals a net increase of 250 GPD when compared to the former industrial building located on the site and an increase of 12,250 GPD when compared to current vacant condition. It is anticipated that the project will flow 100% into the existing 10" diameter sewer through two separate sewer laterals on the project.

A will serve letter request was submitted to the LACSD for a 100% discharge of the project sewer that enters their system.

5.3 Significant Thresholds – Sewer

In accordance with State CEQA Guidelines Appendix G (Appendix G), the Project would have a significant impact related to wastewater if it would:

- Require or result in the construction or relocation of new or expanded wastewater treatment facilities, the construction, or relocation of which would cause significant environmental effects; or
- Result in a determination by the wastewater treatment provider, which serves or may serve

the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

The County of Los Angeles CEQA Thresholds Guide identifies the following criteria to evaluate wastewater impacts:

- The project would cause a measurable increase in wastewater flows at a point where, and a time when, a sewer's capacity is already constrained or that would cause a sewer's capacity to become constrained; or
- The project's additional wastewater flows would substantially or incrementally exceed the future scheduled capacity of any one treatment plant by generating flows greater than those anticipated in the Wastewater Facilities Plan or General Plan and its elements.

In assessing impacts related to wastewater, the County will use Appendix G as the thresholds of significance. The criteria identified above from the L.A. CEQA Thresholds Guide will be used where applicable and relevant to assist in analyzing the Appendix G thresholds.

5.4 Project Impacts

Construction activities for the Project would not result in wastewater generation as construction workers would typically utilize portable restrooms, which would not contribute to wastewater flows to the local wastewater system. Thus, wastewater generation from Project construction activities is not anticipated to cause a measurable increase in wastewater flows. Therefore, the Project construction impacts to the wastewater system would be less than significant.

The Project will require construction of new wastewater infrastructure to serve the new buildings. Construction impacts associated with wastewater infrastructure would primarily be confined to trenching for miscellaneous utility lines and connections to public infrastructure. Installation of wastewater infrastructure will be limited to on-site wastewater distribution, and minor off-site work associated with connections to the public main. Overall, when considering impacts are of a relatively short-term duration (i.e., months) and would cease to occur once the installation is complete. Therefore, Project impacts on wastewater associated with construction activities would be less than significant.

6.0 STORMWATER

6.1 Existing Condition

Both the existing conditions and previous development conditions have been analyzed. The previous development conditions consisted of an industrial building that covered most of the site and a parking lot. The previously developed site was approximately 96.4% impervious and underlain by soil type # 3. The previous development surface drained to the west boundary of the site, to a drainage ditch that flows to a 60" levee drain to Dominguez channel. The commercial building and on-site surface improvements were completely removed approximately 10 years ago. All offsite drainage improvements adjacent to the site remain in place.

The site as it currently exists is the bare pad where the previous development stood. The surface cover consists of compacted fills, and base materials left by the previous development. The existing site is approximately 3.5% impervious and underlain by soil type #3. The existing site drains in the same manner as in the previous development conditions, and to the same offsite improvements.

6.2 Proposed Condition

The proposed development will re-grade the entire site but will keep the same discharge point as the existing and previous developed conditions. The proposed site will be 89.7% impervious.

The project will construct gutters that wrap around the self-storage facilities and direct the runoff generated from the site towards the westerly portion of the site. Runoff will then drain into a 10’x20’ Modular Wetland System for treatment. Following treatment, the stormwater will drain out via pipe flow to a storm drain clean out structure thence to the existing 5’ storm drain inlet and ultimately the Dominguez Channel. This point is referred to as Discharge Point # 1 in this report.

The discharge point will have a 50-year peak discharge that increases from the existing condition but decreases from the previous development. This is accomplished by reducing the impervious footprint of the proposed site compared to that of the previous development.

6.3 SURFACE WATER HYDROLOGY

6.3.1 General Approach

The project is located within the Los Angeles County Flood Control District (LACFD) jurisdiction therefore, the City of Carson has adopted the County Department of Public Works (LACDPW) Hydrology Manual as its basis of design for storm drainage facilities. The LACDPW Hydrology Manual requires runoff from a 25-year frequency design storm falling on a saturated watershed. A 25-year frequency design storm has a probability of 1/25 of being equaled or exceeded in any year. The County’s CEQA Threshold Guide, however, establishes the 50-year frequency design storm event as the threshold to analyze potential impacts on surface water hydrology as a result of development. To provide a more conservative analysis, the 50-year frequency design storm event was analyzed.

6.3.2 Hydrology Results

Table 1 below summarizes the hydrology results demonstrating the peak flows for the 25-,50-, and 100-year storm events under previously developed, existing, and proposed project conditions:

Table 1. Previously Developed, Existing, and Proposed Peak Runoff Flows

	Previously Developed	Existing	Proposed		
Storm Event	Q_{Total} [cfs]	Q_{Total} [cfs]	Q_{Total} [cfs]	% Change from Existing	% Change from Prior Development
25-Yr	6.26	1.96	5.57	+64.8%	-11.0%
50-Yr	7.61	3.12	6.74	+53.7%	-11.4%
100-Yr	8.55	4.08	7.79	+47.6%	-8.8%

The review demonstrates that the project will exceed the existing stormwater flows. However, when compared to the previous development site flows the project would have a net decrease in stormwater flows. The proposed project will treat and convey stormwater runoff to the existing drainage infrastructure that the previous industrial site also drained to. The existing infrastructure includes a concrete brow ditch running parallel to the southwest property line of the site. This brow ditch flows into a 60” RCP levee drain that discharges to Dominguez Channel, a tidally influenced water body. This offsite drainage infrastructure appears to be unchanged since the previous industrial site was demolished 10 years ago.

The 60” RCP levee drain that accepts flow from the site was constructed in 1963. When it was designed, it accepted flow from a much larger area than it does in in the existing conditions. As the area surrounding the site was developed, separate offsite-storm drain systems with separate outfalls were constructed. These offsite MS4 systems intercept the majority of the runoff that was tributary to the levee drain. In the existing conditions, the land that drains to the levee drain has been greatly reduced. The area tributary to the drain consists of the project site and a thin strip of offsite land west of the site.

This means that the offsite drainage improvements between the project site and Dominguez Chanel are significantly larger than is required by the development.

The Project will include the installation of private roof downspouts, planter drains throughout the project site to collect roof and site runoff, and direct stormwater to the LID system through a series of gutters. This onsite stormwater conveyance system would serve to prevent onsite flooding and nuisance water build-up on the Project Site.

For additional information and detailing see the full Hydrology report in the Appendices.

6.4 SURFACE WATER QUALITY

6.4.1 General Approach

Construction Best Management Practices (BMP's) will be designed and maintained as part of the implementation of the SWPPP in compliance with the General Permit. The SWPPP shall begin when construction commences. Before any site clearing and grubbing of demolition activity. During construction, the SWPPP will be referred to regulatory standards, and amended as changes occur throughout the construction process. The Notice of Intent (NOI), Amendments to the SWPPP, Annual Reports, Rain Event Action Plans (REAPs), and Non-Compliance Reporting will be posted to the State's SMARTS website in compliance with the requirements of the General Permit.

The Project falls under the jurisdiction of the Los Angeles County Department of Public Works, which follows the 2009 Low Impact Development (LID) Manual design guidelines. The purpose of this structure water quality report is:

- To document that the Los Angeles County LID requirements will be met;
- To determine the proposed development's impact on existing hydrologic conditions;
- To identify the pollutants of concern and provide BMPs that will mitigate those pollutants of concern; and
- To provide sufficient detailed information to support detailed hydraulic design stormwater treatment systems.

The LID requirements, approved by the Regional Water Quality Control Board, call for the treatment of the peak mitigation flow rate or volume of runoff produced either by a 0.75" 24-hr rainfall event or the 85th percentile rainfall event, whichever is greater. Under section 3.1.2 of the LID Manual, this post-construction stormwater runoff from the new development shall be infiltrated, evapotranspirated, captured and used, and/or treated through high efficiency BMP's onsite. The rainfall intensity of the 85th percentile rainfall event governs.

Table 1 Summary LID Mitigation BMPs

Description	Area [ac]	Impervious Area [ac]	Required Flowrate (CFS)	BMP Type	Provided Flowrate (CFS)	% Treated	Impervious Area Untreated [ac]
DMA-1	2.77	2.49	0.702	20x10 Modular Wetland System	0.710	100	0
Total Percent Treatment						100 %	

For further information and detailing see LID Plan in the Appendices.

6.5 SIGNIFICANCE THRESHOLDS

6.5.1 Surface Water Hydrology

With respect to surface water hydrology, the State 2019 CEQA Guidelines (Appendix G) inquire whether
the Project would:

- 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:
  - Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?
  - 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:
    - Result in substantial erosion or siltation on- or off-site;
    - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
    - 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
    - Impede or redirect flood flows?
    - In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

6.5.2 Surface Water Quality

With respect to surface water quality, the State 2019 CEQA Guidelines (Appendix G) inquire whether the Project would:

- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The Appendix G of the CEQA Guidelines can be used to determine the significance of a project’s impact on surface water quality. These are defined in Section 13050 of the California Water Code (CWC). Pollution, contamination, or nuisance may occur if regulatory standards are violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan for the receiving water body. The CWC include the following definitions:

"Pollution" means an alteration of the quality of waters of the state to a degree which unreasonably affects either the following: 1) the waters for beneficial uses or 2) facilities which serve these beneficial uses. "Pollution" may include "Contamination".

"Contamination" means an impairment of the quality of the waters of the state by waste to a degree, which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

"Nuisance" means anything which meets all of the following requirements: 1) is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property; 2) affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extend of the annoyance or damage inflicted upon individuals may be unequal; and 3) occurs during, or as a result of the treatment or disposal of wastes.

6.6 PROJECT STORMWATER IMPACT ANALYSIS

6.6.1 Surface Water Hydrology

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☑
b. Substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river, in a manner which would:	☐	☐	☐	☑
i. Result in substantial erosion or siltation on or off-site;	☐	☐	☐	☑
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off-site;	☐	☐	☐	☑

iii. Create or combine runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted; or	☐	☐	☐	☑
iv. Impede or redirect flood flows?	☐	☐	☐	☑
c. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☑
d. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☑

a. **Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?**

No Impact. Project is not located near ground recharge wells, and no groundwater recharge facilities exist downstream of the project between the project and its ultimate outfall to Dominguez Channel.

b. **Would the project substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river, in a manner which would:**

i. **result in substantial erosion or siltation on or off-site;**

No Impact. The proposed site would be almost entirely impervious. Drainage conveyance from the site to Dominguez Channel is hardened. No areas will exist on or offsite produce silt, and no unhardened conveyances will exist to be eroded.

ii. **substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off-site**

No Impact. As previously discussed in section 6.3.2, while runoff will increase compared to existing conditions, it will not increase over the conditions for which the offsite drainage conveyances have been designed. All proposed onsite conveyances have been designed to safely convey the flowrates generated by the 100-year storm without negative impacts to the proposed buildings.

iii. **create or combine runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollution**

No Impact. As previously detailed, the planned onsite stormwater conveyances will be sized to safely convey the 100-year storm. The existing offsite conveyances were build to handle flow from a much larger area than currently drains to them.

iv. **impede or redirect flood flows?**

No Impact. There will be no impeded or redirected flood flows, as the site receives no stormwater from off-site areas.

c. **In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?**

Less Than Significant Impact. Per the Geotechnical report included as part of the LID plan in the Appendices, "The site is not located within a coastal area. Therefore, tsunamis are not considered a significant hazard at the site. Seiches are large waves generated in enclosed bodies of water in response to ground shaking. No major water-retaining structures are located immediately up gradient from the project site. Therefore, flooding resulting from a seismic-induced seiche is considered unlikely."

d. **Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?**

No Impact. The proposed project will not conflict or obstruct with implementation of a water quality control plan or sustainable groundwater management plan.

6.6.1 Surface Water Hydrology

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☑
b. Otherwise substantially degrade water quality?	☐	☐	☐	☑

a. **Violate any water quality standards or waste discharge requirements?**

No Impact. Project will comply with all water quality standards and waste discharge requirements.

b. **otherwise substantially degrade water quality??**

No Impact. Project does not propose a use that will substantially degrade water quality. Additionally, a compact biofiltration unit (Modular Wetland System) will be used to filter all runoff produced by the site for the 85^{th} percentile storm.

7.0 ELECTRICTY

7.1 Existing Condition

The projects electric service provider will be Southern California Edison. There are no apparent existing electrical structures or equipment on the site, but this will be verified during the removal process.

7.2 Proposed Condition

Temporary Power: There is overhead power available from the pole at the south-east corner of the property which can be a potential source, given that the temporary power is no more than 200A-600A Single Phase.

Permanent Power: The proposed development would have Southern California Edison run a primary cable from the existing Edison manhole on South Perry Street to a proposed onsite 10' x 12' transformer pad approximately 175' away. Based off historical data provided to SCE, to service buildings of this size & expected usage in this climate zone, DUEX anticipates a single transformer to feed the entire site. All estimated kVA's per building can be found on the proposed utility exhibit in the Appendices.

7.3 Project Impacts

The project will require construction of a single 10' x 12' transformer pad. Additionally, during construction temporary power will need to be obtained via an overhead power available from the pole at the south-east corner of the property which can provide temporary power no more than 200A-600A Single Phase.

8.0 GAS

8.1 Existing Condition

The project gas service provider will be Southern California Gas Company. There are no apparent gas facilities on the existing site, but this will be verified during the removal process.

8.2 Proposed Condition

The proposed development would have the project connect to the existing gas mainline located in South Perry Street east of the property.

8.3 Project Impacts

Southern California Gas will need to obtain permits to conduct work in the public right of way. Additionally, note that gas meters must be 3' away from any doors and windows, if under an opening window must be minimum 10' above. Gas meters must be easily accessible for emergencies & maintenance.

9.0 TELECOMMUNICAIONS

9.1 Existing Condition

The project telecommunication provider will be AT&T. There are no apparent existing telephone structures or equipment on the site, but this will be verified during the removal process.

9.2 Proposed Condition

The proposed development would have the site tie in overhead at the existing overhead line on East Carson Street. AT&T would then run their services to the proposed pullbox location on Perry Street. The AT&T point of connection is pending confirmation.

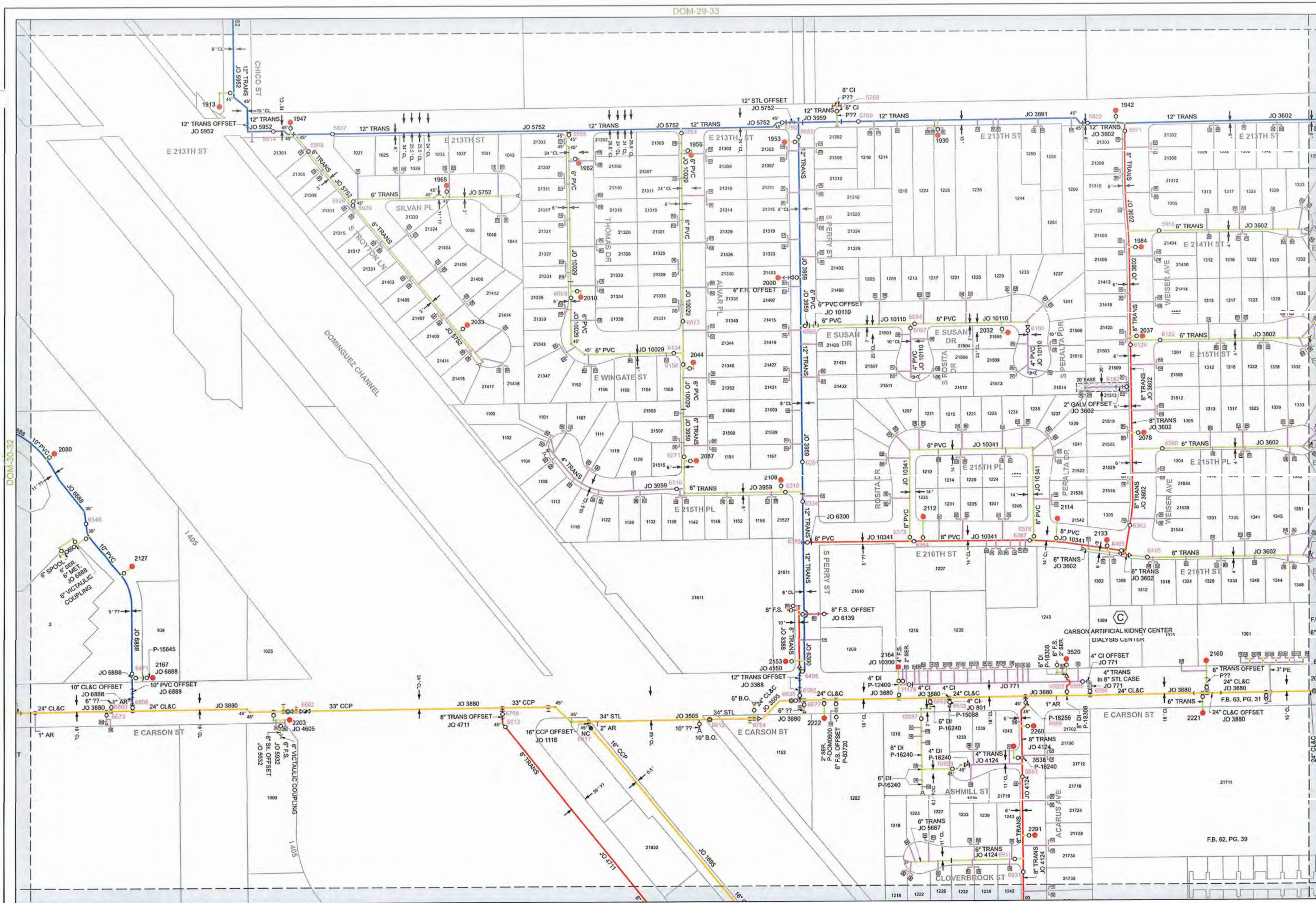
9.3 Project Impacts

AT&T will require a typical marketing agreement executed to bring fiber to the site. The location and installation of the AT&T facilities will require further coordination.

10.0 LEVEL OF SIGNIFICANCE

Based on the analysis of the proposed project, no significant impacts have been identified for water, sewer, stormwater, electrical, natural gas, or telecommunications facilities

11.0 APPENDICES



ENGINEERING DEPARTMENT

GIS

DOMINGUEZ DISTRICT WATER SYSTEM

N

SCALE:
1" = 200'

Issued:
October 2017

Plat Sheet:
DOM-30-33

CALIFORNIA WATER SERVICE
Rancho Dominguez District 2632 West 237th Street, Torrance, CA 90505
Tel: (310) 257-1400

November 15, 2021

21611 Perry Street, LLC
4132 Katella Avenue #205b
Los Alamitos, CA 90720
Attn: Darren Embry

Will Serve Letter
21611 Perry Street, Carson, CA
Requestor for Will Serve: Darren Embry

Dear Mr. Embry:

As a regulated utility, California Water Service Company Rancho Dominguez district ("Cal Water") has an obligation to provide water service in accordance with the rules and regulations of the California Public Utility Commission (CPUC). Assuming you receive all required permits from the city of Carson and / or the County of Los Angeles, Cal Water will provide water service to the above referenced project. Cal Water agrees to operate the water system and provide service in accordance with the rules and regulations of the California Public Utilities Commission (CPUC) and the company's approved tariffs on file with the CPUC. This will serve letter shall remain valid for **two years** from the date of this letter. If construction of the project has not commenced within this **two year** time frame, Cal Water will be under no further obligation to serve the project unless the developer receives an updated letter from Cal Water reconfirming our commitment to serve the above mentioned project. Additionally, Cal Water reserves the right to rescind this letter at any time in the event its water supply is severely reduced by legislative, regulatory or environmental actions.

Cal Water will provide such potable water at such pressure as may be available from time to time as a result of its normal operations per the company's tariffs on file with the CPUC. Installation of facilities through developer funding shall be made in accordance with the current rules and regulations of the CPUC including, among others, Tariff Rules 15 and 16 and General Order 103-A. In order for us to provide adequate water for domestic use as well as fire service protection, it may be necessary for the developer to fund the cost of special facilities, such as, but not limited to, booster pumps, storage tanks and/or water wells, in addition to the cost of mains and services. Cal Water will provide more specific information regarding special facilities and fees after you provide us with your improvement plans, fire department requirements, and engineering fees for this project.

This letter shall at all times be subject to such changes or modifications by the CPUC as said Commission may, from time to time, require in the exercise of its jurisdiction.

If you have any questions regarding the above, please call me at (310) 257-1400.

Sincerely,

Daniel Armendariz
District Manager

cc: Rashmi Kashyap – Cal Water Engineering Dept
Ralph Felix – Cal Water Operations Manager
Anthony Gonzalez – Cal Water Superintendent
File

California Water Service Company
Fire Flow Test

2/7/2022

Test Date: 02/04/2022 Time: 9:00

District DOMINGUEZ Zone: II Plat: 30-33

Address: 21611 S Perry ST

Cross Street: E Carson ST

Requested By: D. Embry

Conducted By: Evan G.

Purpose Of Test: Determine Flow Availability

Witnessed By: Calwater: Richard P.

Others: Chris

Outlet No.	Outlet Size	PITOT	Observed	Static Pressure	Residual Pressure	Flow Observed	Flow Avail. @20
Location 1 Hydrant No.: 2153			Address: 21611 Perry St				
1	4.00	35	2541	67	48	2541	4144
2							
3							
4							
Location 2 Hydrant No.: 2108			Address: 21527 E. 215th Pl				
1	4.00	22	2015			2015	3286
2							
3							
4							
Location 3 Hydrant No.			Address:				
1							
2							
3							
4							
			Total Flow Observed Available @20:			4556	7430

Remarks: Elevation Difference: 0'. Distance from Static/Residual to FH: 149' & 398'. Distance from FH to Street Address P/L: 84' & 321'.

Static/Residual Location: 1209 E Carson St

Note:

Regardless of the results of this test, California Water Service Company assumes no liability beyond that stated in the following excerpt from the P.U.C. Tarriff Schedule: "The utility (California Water Service Company) will supply only such water at such pressure as may be available from time to time as a result of its normal operation of the system."

PART II

INFORMATION ON FIRE FLOW AVAILABILITY
(Part II to be completed by Water Purveyor)

Location of hydrant west side of S Perry St
north of E Carson St

Hydrant Number 2153

Distance from Nearest Property Line 84'   Size of Hydrant 6"   Size of Water main 12"

Static PSI 67   Residual PSI 48   Orifice size 4"   Pitot 35 PSI

Fire Flow at 20 PSI 4144 GPM   Duration 2 Hours   [x] Flow Test Date / Time 02/04/2022, 09:00am   [ ] Hydraulic model

---

Location of hydrant south side of E 215th Pl
west of S Perry St

Hydrant Number 2108

Distance from Nearest Property Line 321'   Size of Hydrant 6"   Size of Water main 6"

Static PSI 67   Residual PSI 48   Orifice size 4"   Pitot 22 PSI

Fire Flow at 20 PSI 3286 GPM   Duration 2 hours   [x] Flow Test Date / Time 02/04/2022, 09:00am   [ ] Hydraulic model

[x] (Check box if Simultaneous/ Dual flow test was performed)   Combined flow at 20 psi 7430 GPM

Location of hydrant ____________________

Hydrant Number ________

Distance from Nearest Property Line ________   Size of Hydrant ________   Size of Water main ________

Static PSI ________   Residual PSI ________   Orifice size ________   Pitot ________

Fire Flow at 20 PSI ________   Duration ________   [ ] Flow Test Date / Time ________   [ ] Hydraulic model

[ ] (Check box if Simultaneous/ Triple flow test was performed)   Combined flow at 20 psi ________

California Water Service - Dominguez
Water Purveyor

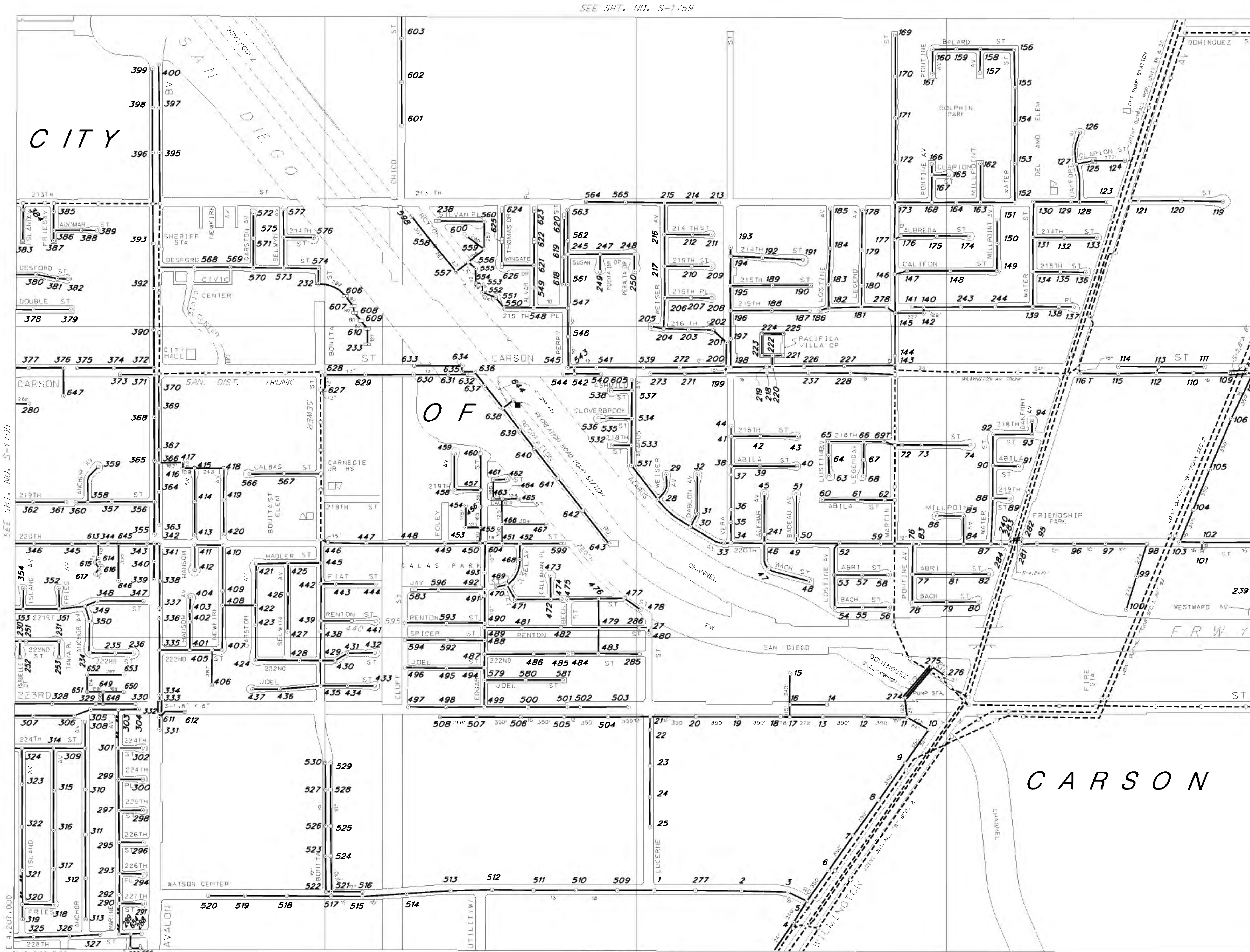
Signature

310-257-1400   02/15/2022
Phone Number   Date

Superintendent (Richard Garcia)
Title

<u>This Information is Considered Valid for Twenty Four Months</u>

Fire Department approval of building plans shall be required prior to the issuance of a Building Permit by the jurisdictional Building Department. Any deficiencies in water systems will need to be resolved by the Fire Prevention Division only prior to this department's approval of building plans.



C-34
C-35
C-36

THIS MAP IS INTENDED FOR USE ONLY AS OPERATIONS MAP BY LOS ANGELES COUNTY SEWER MAINTENANCE DISTRICTS. LOS ANGELES COUNTY EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY INACCURACIES WHICH MAY BE PRESENT IN THIS MAP.

AUTOMATED GRAPHICS

METERS 0 50 100 200 250
0 200 400 600 800 FEET

LEGEND

- CLAY SEWERS MAINTAINED BY SMD. 8" UNLESS OTHERWISE NOTED
- PLASTIC SEWERS
- CONCRETE SEWERS
- CLAY SEWERS, LINED
- CEMENT SEWERS, LINED
- FORCE MAINS
- SEWERS NOT MAINTAINED BY SMD
- TRUNK SEWERS
- CITY BOUNDARY
- STANDARD MANHOLE
- DROP MANHOLE
- SHALLOW MANHOLE
- TRAP MANHOLE
- WEIR MANHOLE
- C.O. CLEANOUT
- L.H. LAMP HOLE
- PUMP STATION

TOTAL MH'S THIS MAP: 615

MAP REV 05-19-16
DATA BASE REV 05-21-86

CONSOLIDATED S.M.D.

T: 764 E-7

0319.0319.1760

LOS ANGELES COUNTY
SANITATION DISTRICTS
Converting Waste Into Resources

Robert C. Ferrante
Chief Engineer and General Manager

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
(562) 699-7411 • www.lacsd.org

January 31, 2022

Ref. DOC 6440338

Mr. Darren Embry, Vice President
21611 Perry Street LLC
3430 Viewridge Avenue, Suite B
San Diego, CA 92123

Dear Mr. Embry:

Will Serve Letter for Perry Street Self-Storage

The Los Angeles County Sanitation Districts (Districts) received your will serve letter request for the subject project on January 20, 2022. The proposed project is located within the jurisdictional boundary of District No. 8. We offer the following comments regarding sewerage service:

1. The wastewater flow originating from the proposed project will discharge to a local sewer line, which is not maintained by the Districts, for conveyance to the Districts' Wilmington Avenue Trunk Sewer, located in Martin Street at Carson Street. The Districts' 27-inch diameter trunk sewer has a capacity of 6.9 million gallons per day (mgd) and conveyed a peak flow of 1 mgd when last measured in 2016.

2. The wastewater generated by the proposed project will be treated at the Joint Water Pollution Control Plant located in the City of Carson, which has a capacity of 400 mgd and currently processes an average flow of 249.8 mgd.

3. The expected increase in average wastewater flow from the project, described in the application as a 113,818 square-foot indoor self-storage facility with a 1,550 square-foot café and a 3,100 square-foot retail store, is 2,536 gallons per day, after all structures on the project site are demolished. For a copy of the Districts' average wastewater generation factors, go to www.lacsd.org, Wastewater & Sewer Systems, click on Will Serve Program, and click on the Table 1, Loadings for Each Class of Land Use link.

4. The Districts are empowered by the California Health and Safety Code to charge a fee to connect facilities (directly or indirectly) to the Districts' Sewerage System or to increase the strength or quantity of wastewater discharged from connected facilities. This connection fee is used by the Districts for its capital facilities. Payment of a connection fee may be required before this project is permitted to discharge to the Districts' Sewerage System. For more information and a copy of the Connection Fee Information Sheet, go to www.lacsd.org, under Services, then Wastewater (Sewage) and select Rates & Fees. In determining the impact to the Sewerage System and applicable connection fees, the Districts will determine the user category (e.g. Condominium, Single Family home, etc.) that best represents the actual or anticipated use of the parcel(s) or facilities on the parcel(s) in the development. For more specific information regarding the connection fee application procedure and fees, the developer should contact the Districts' Wastewater Fee Public Counter at (562) 908-4288, extension 2727.

5. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development

of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CAA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise the developer that the Districts intend to provide this service up to the levels that are legally permitted and to inform the developer of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2708 or at dcurry@lacsd.org.

Very truly yours,

Donna J. Curry

Donna J. Curry
Customer Service Specialist
Facilities Planning Department

DC:dc

Carson Self-Storage
Drainage Study

21611 South Perry St.
Carson, CA 90745

Date Prepared:
March 8, 2022

Prepared for:
21611 Perry Street, LLC
4132 Katella Avenue, #205B
Los Alamitos, CA 90720

Prepared By:

OMEGA
ENGINEERING CONSULTANTS
4340 Viewridge Ave, Suite B
San Diego, CA 92113
Ph: (858) 634-8620

Declaration of Responsible Charge:
I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current standards. I understand that the check of the project drawings and specifications by the City of Carson is confined to a review only and does not relieve me, as an engineer of work, of my responsibilities for project design.

Patric T. de Boer RCE 83583
Registration Expires 3-31-2023

REGISTERED PROFESSIONAL ENGINEER
PATRIC T DEBOER
No.83583
CIVIL
STATE OF CALIFORNIA

Table of Contents

Appendices

Site & Project Description

This drainage study has been prepared for Carson Self-Storage located at 21611 South Perry Street in the City of Carson.

The project involves the construction of three two-story storage buildings with asphalt paving throughout the development. The total area of analysis is 2.77 acres.

See figure No.1 for a Vicinity Map. Figures 2, 3, & 4 show the existing and proposed drainage flow paths and basins.

Methodology

This drainage report has been prepared in accordance with current County of Los Angeles regulations and procedures.

The analysis of the previously developed, currently existing and proposed conditions were performed using HydroCalc (Version 1.02) to calculate runoff rates and volumes. Given the area, length of flow path, average slope, design storm depth, imperviousness, and soil type, HydroCalc generates a hydrograph for the existing and proposed conditions. Soil and rainfall input data was determined using the maps provided in the LA County Hydrology Manual.

This report analyzes the flow generated by the 50 and 100-year storm events for storm drain sizing and flood control purposes.

(1) Handbook of Hydraulics, E.F. Brater & H.W. King, 6th Ed., 1976.
(2) Los Angeles County Department of Public Works Hydrology Manual, 2006

Previously Developed Conditions

The previous developed conditions which consisted of an industrial building that covered most of the site and a parking lot have been analyzed. The previously developed site was approximately 96.4% impervious and underlain by soil type # 3. The site drained via surface flow from east to west to an existing 5' storm drain inlet that outlets to the Dominguez Channel, a concrete lined channel. This point is referred to as Discharge Point # 1 in this report.

Existing Conditions

The existing condition site is approximately 3.5% impervious and underlain by soil type #3. The site drains via surface flow from east to west to an existing 5' storm drain inlet that outlets to the Dominguez Channel, a concrete lined channel. This point is referred to as Discharge Point # 1 in this report.

Proposed Conditions

The proposed development will re-grade the entire site but will keep the same discharge point as the existing and previous developed conditions. The proposed site will be 89.7% impervious.

The project will construct gutters that wrap around the self-storage facilities and direct the runoff generated from the site towards the westerly portion of the site. Runoff will then drain into a 10'x20' Modular Wetland System for treatment. Following treatment, the stormwater will drain out via pipe flow to a storm drain clean out structure thence to the existing 5' storm drain inlet and ultimately the Dominguez Channel. This point is referred to as Discharge Point # 1 in this report.

The discharge point will have a 50-year peak discharge that increases from the existing condition but decreases from the previous development. This is accomplished by reducing the impervious footprint of the proposed site compared to that of the previous development.

Previous Development HydroCalc Analysis

The previous developed condition was modeled using HydroCalc. The area of analysis consists of one basin being E-1.1.

Below is a summary of the results of the HydroCalc Calculations for the previous development conditions (E-1.1).

Basin #	Area (ac)	Soil Type	Imperv. (%)	$T_{C\,50}$ (min)	I_{50} (in/hr)	$T_{C\,100}$ (min)	I_{100} (in/hr)	Q_{25} (cfs)	Q_{50} (cfs)	Q_{100} (cfs)
E-1.1	2.77	3	96.4	10.0	3.11	9.0	3.49	6.26	7.61	8.55
							Total	6.26	7.61	8.55

Existing HydroCalc Analysis

The existing condition was modeled using HydroCalc. The area of analysis consists of one basin being A-1.1.

Below is a summary of the results of the HydroCalc Calculations for the existing conditions (A-1.1).

Basin #	Area (ac)	Soil Type	Imperv. (%)	$T_{C\,50}$ (min)	I_{50} (in/hr)	$T_{C\,100}$ (min)	I_{100} (in/hr)	Q_{25} (cfs)	Q_{50} (cfs)	Q_{100} (cfs)
A-1.1	2.77	3	3.50	7.0	2.63	7.0	3.10	1.96	3.12	4.08
							Total	1.96	3.12	4.08

Proposed HydroCalc Analysis

The proposed site was modeled as two basins, referred to as P-1.1 and P-1.2 in this report.

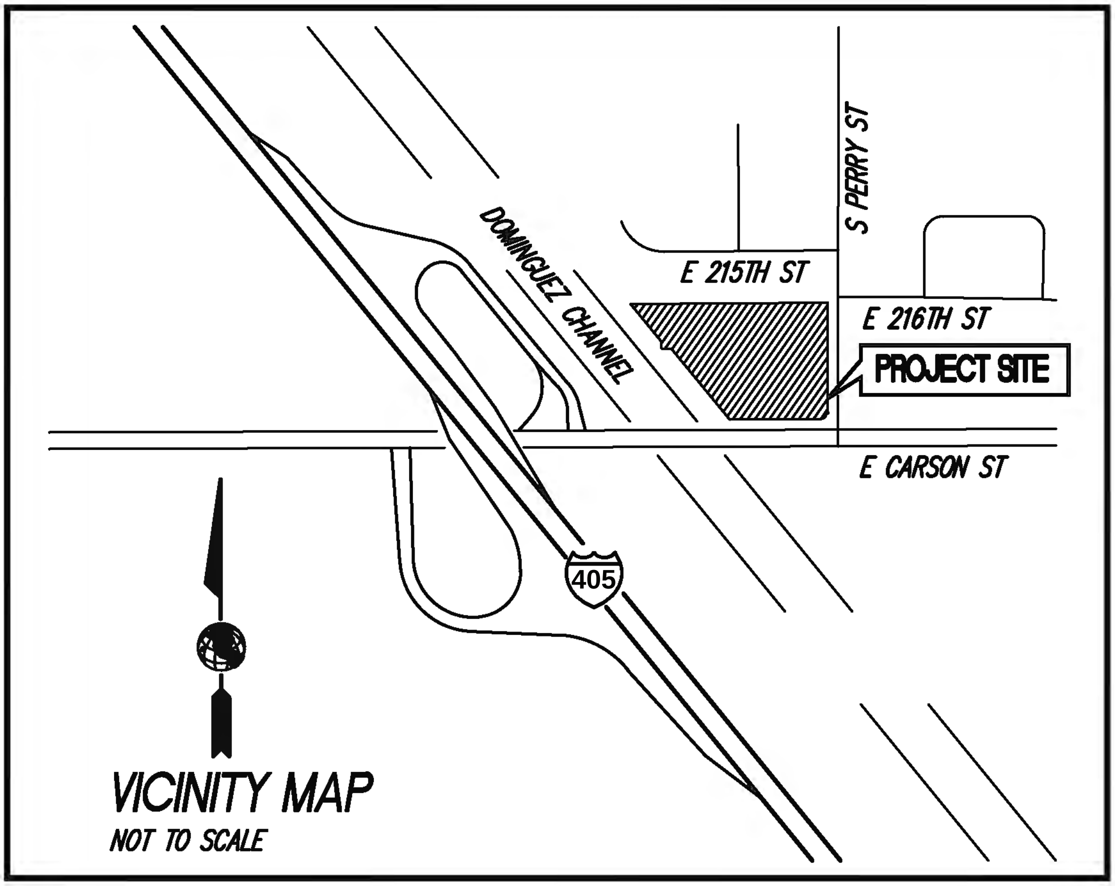
Below is a summary of the HydroCalc calculations for the proposed conditions.

Basin #	Area (ac)	Soil Type	Imperv. (%)	$T_{C\ 50}$ (min)	I_{50} (in/hr)	$T_{C\ 100}$ (min)	I_{100} (in/hr)	Q_{50} (cfs)	Q_{100} (cfs)
P-1.1	1.44	3	90.6	10.0	2.63	9.0	3.10	3.23	3.83
P-1.2	1.33	3	88.9	7.0	3.11	7.0	3.49	3.52	3.97
							Total	6.74	7.79

Results and Conclusions

The development of the project site will slightly modify the onsite drainage patterns; however, the existing and previous development point of discharge and the point of compliance remain the same.

The review demonstrates that the project will exceed the existing stormwater flows. However, when compared to the previous development site flows the project would have a net decrease in stormwater flows. The proposed project will treat and convey stormwater runoff to the existing drainage infrastructure that the previous industrial site also drained to. The existing infrastructure includes a concrete brow ditch running parallel to the southwest property line of the site. This brow ditch flows into a 60" RCP levee drain that discharges to Dominguez Channel, a tidally influenced water body. This offsite drainage infrastructure appears to be unchanged since the previous industrial site was demolished approximately 10 years ago.

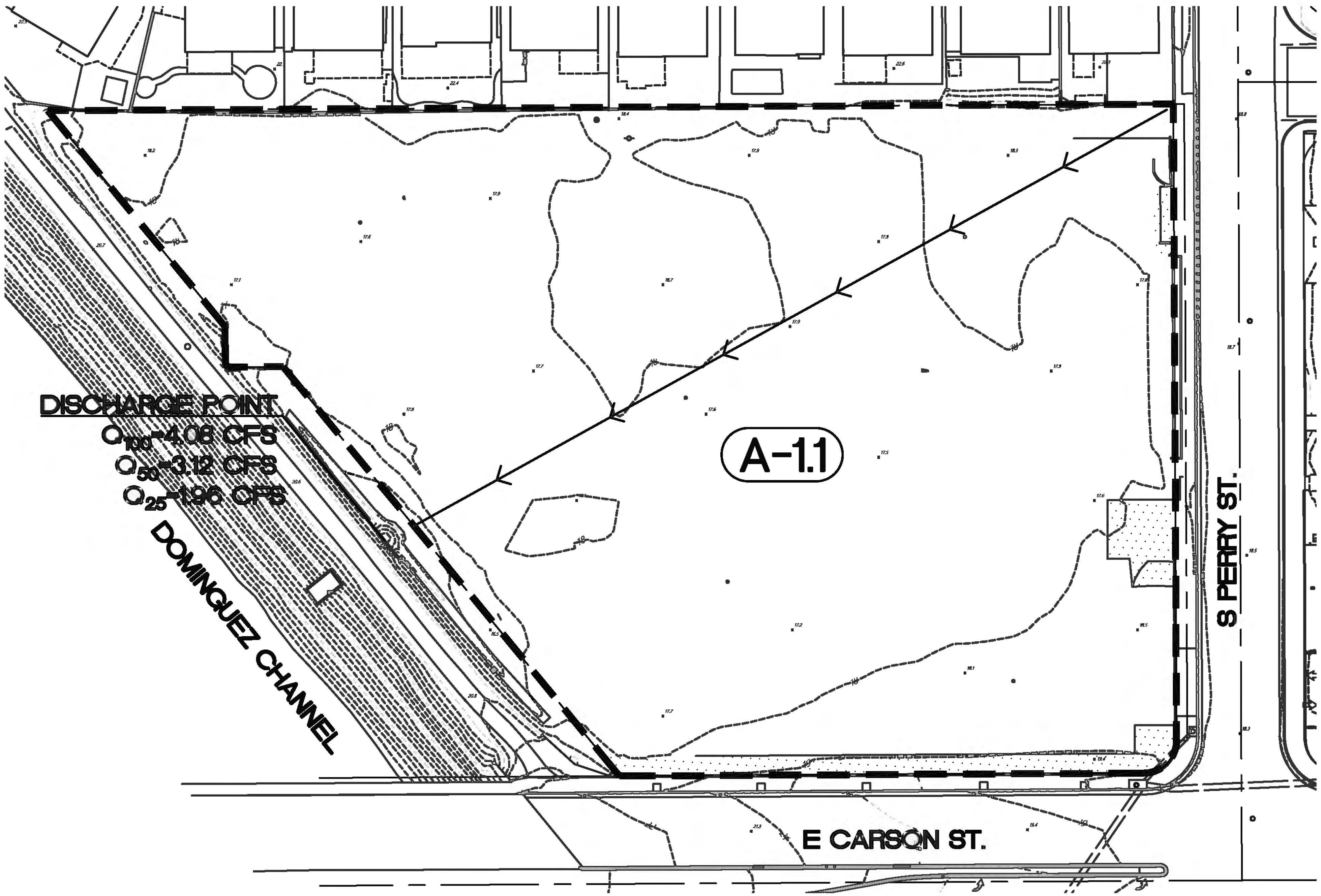

DOMINGUEZ CHANNEL
S PERRY ST
E 215TH ST
E 216TH ST
PROJECT SITE
E CARSON ST
405
VICINITY MAP
NOT TO SCALE

DRAINAGE BASIN DATA

BASIN #	AREA (AC)	SOIL TYPE	IMPERV. (%)	I_{25} (IN/HR)	I_{50} (IN/HR)	I_{100} (IN/HR)	Q_{25} (CFS)	Q_{50} (CFS)	Q_{100} (CFS)
A-1.1	2.77	3	3.5	2.04	2.63	3.10	1.96	3.12	4.08

LEGEND

- BASIN NUMBER .... A-#.#
- AREA LIMITS ....
- DRAINAGE FLOW PATH ....
- PAVEMENT AREA ....
- PERVIOUS AREA ....



GRAPHICAL SCALE: 1" = 60'

0 30 60 120

CARSON SELF-STORAGE EXISTING HYDROLOGY EXHIBIT

OMEGA

EXISTING HYDROLOGY EXHIBIT

DRAINAGE BASIN DATA

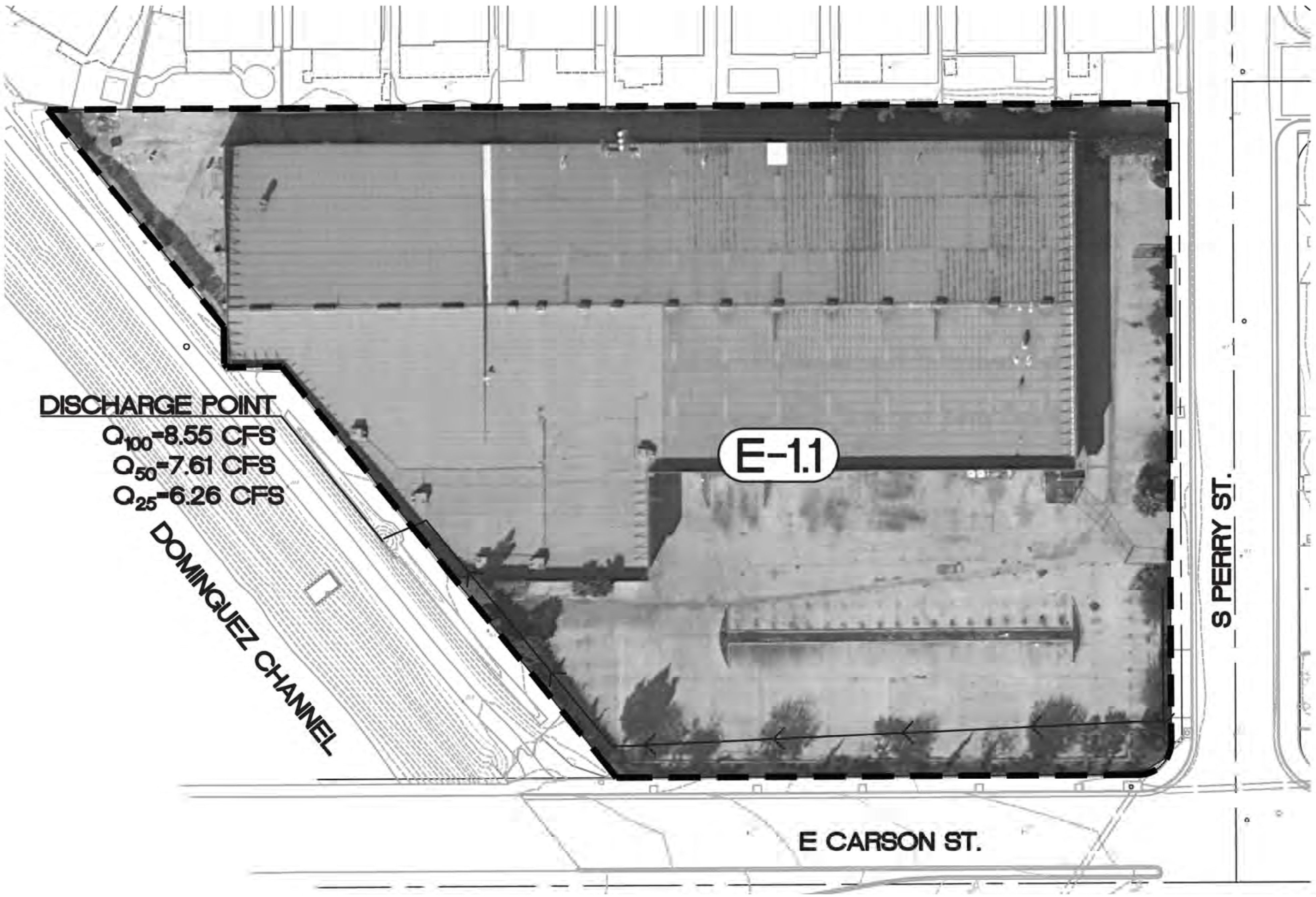
BASIN #	AREA (AC)	SOIL TYPE	IMPERV. (%)	I_{25} (IN/HR)	I_{50} (IN/HR)	I_{100} (IN/HR)	Q_{25} (CFS)	Q_{50} (CFS)	Q_{100} (CFS)
E-1.1	2.77	3	96.4	2.56	3.11	3.49	6.26	7.61	8.55

LEGEND

BASIN NUMBER .... E-#.#

AREA LIMITS ....

DRAINAGE FLOW PATH ....



GRAPHICAL SCALE: 1" = 60'

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CARSON SELF-STORAGE
PRE-DEVELOPED
EXHIBIT

OMEGA

PRE-DEVELOPED HYDROLOGY EXHIBIT

DRAINAGE BASIN DATA

BASIN #	AREA (AC)	SOIL TYPE	IMPERV. (%)	I_{25} (IN/HR)	I_{50} (IN/HR)	I_{100} (IN/HR)	Q_{25} (CFS)	Q_{50} (CFS)	Q_{100} (CFS)
P-1.1	1.44	3	90.6	2.21	2.63	3.10	2.70	3.23	3.83
P-1.2	1.33	3	88.9	2.56	3.11	3.49	2.88	3.52	3.97

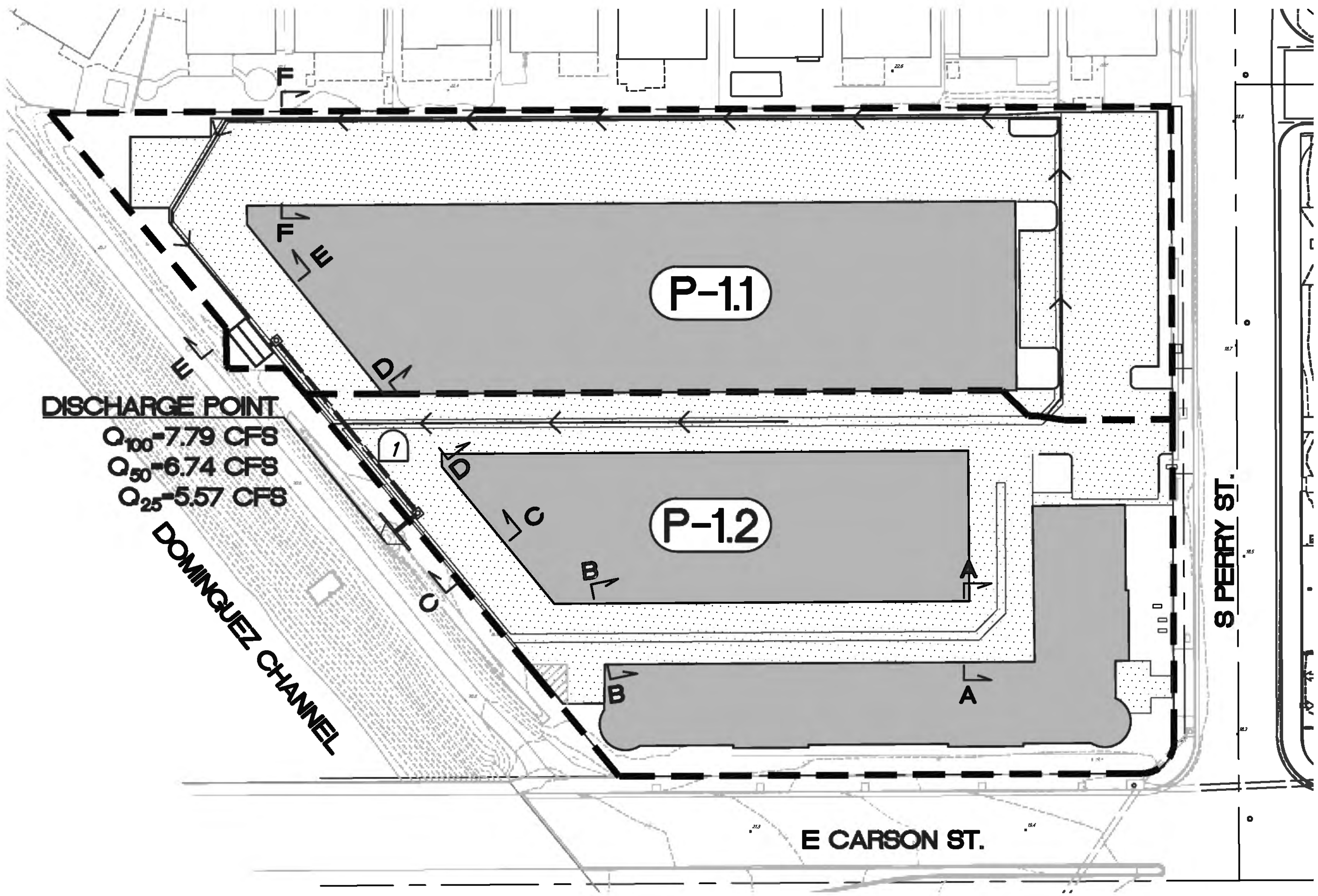
LEGEND

BASIN NUMBER	P-#.#
AREA LIMITS	
DRAINAGE FLOW PATH	
BUILDING AREA	
PAVEMENT AREA	
PERVIOUS AREA	

(X) PIPE DATA

PIPE #	DIAMETER (INCHES)	SLOPE (%)	DEPTH /DIA	V_{100} (FPS)	Q_{100} (CFS)
1	18	1.0	0.64	6.52	7.79

NOTE: SEE APPENDIX 4 IN THE HYDROLOGY REPORT FOR GUTTER ANALYSIS SECTIONS



GRAPHICAL SCALE: 1" = 60'

0 30 60 120

CARSON SELF-STORAGE PROPOSED HYDROLOGY EXHIBIT

OMEGA

PROP. HYDROLOGY EXHIBIT

Peak Flow Hydrologic Analysis

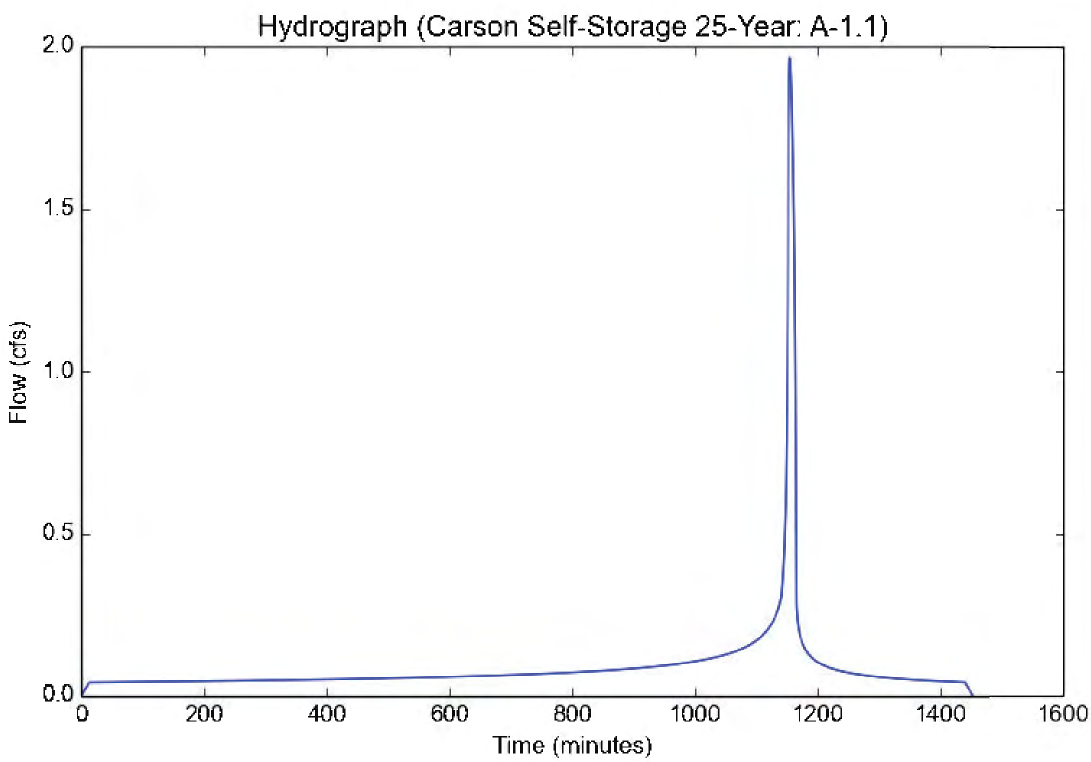
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/25-Year/Carson Self-Storage 25-Year - A-1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self-Storage 25-Year
Subarea ID	A-1.1
Area (ac)	2.77
Flow Path Length (ft)	398.0
Flow Path Slope (vft/hft)	0.007
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.035
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.3558
Peak Intensity (in/hr)	2.0393
Undeveloped Runoff Coefficient (Cu)	0.3278
Developed Runoff Coefficient (Cd)	0.3478
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	1.9646
Burned Peak Flow Rate (cfs)	1.9646
24-Hr Clear Runoff Volume (ac-ft)	0.1771
24-Hr Clear Runoff Volume (cu-ft)	7713.7249



Peak Flow Hydrologic Analysis

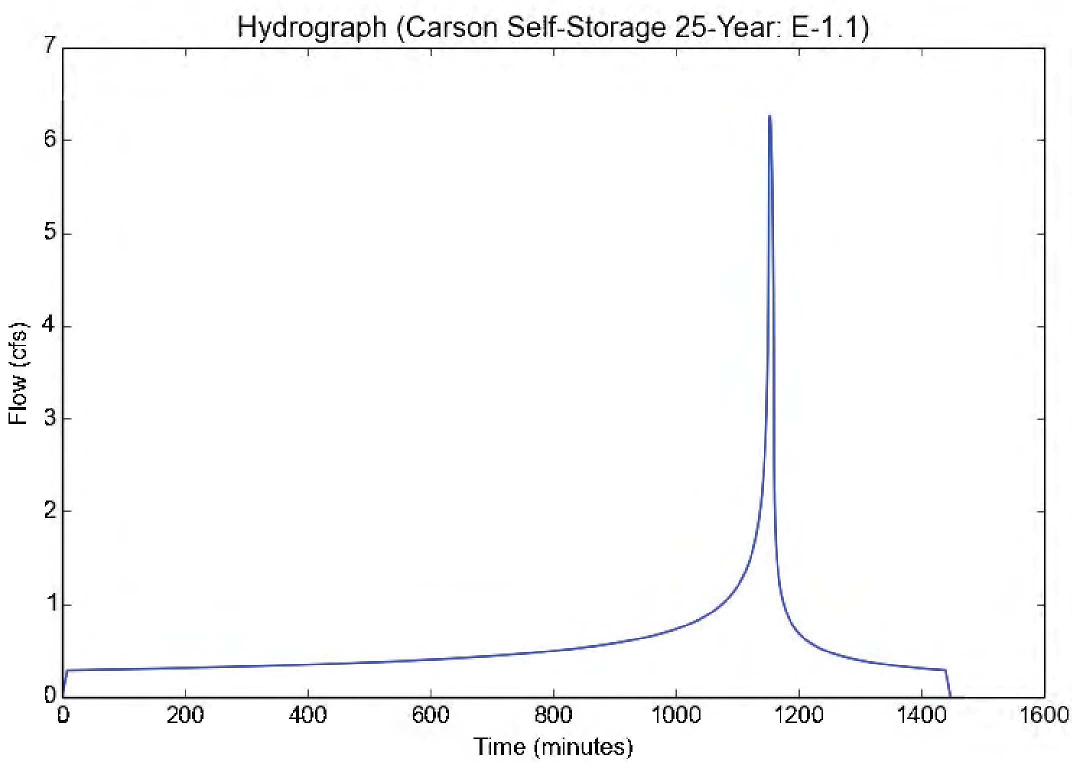
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/25-Year/Carson Self-Storage 25-Year - E-1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self-Storage 25-Year
Subarea ID	E-1.1
Area (ac)	2.77
Flow Path Length (ft)	475.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.964
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.3558
Peak Intensity (in/hr)	2.5621
Undeveloped Runoff Coefficient (Cu)	0.4041
Developed Runoff Coefficient (Cd)	0.8821
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	6.2605
Burned Peak Flow Rate (cfs)	6.2605
24-Hr Clear Runoff Volume (ac-ft)	1.069
24-Hr Clear Runoff Volume (cu-ft)	46566.8167



Peak Flow Hydrologic Analysis

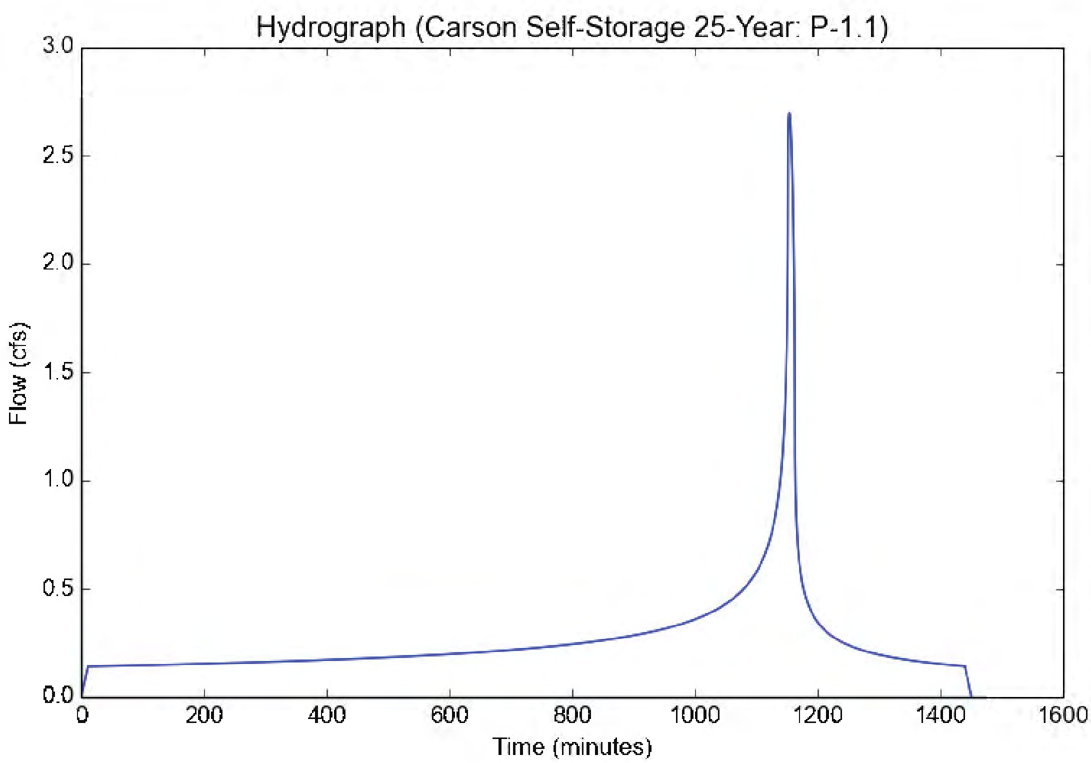
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/25-Year/Carson Self-Storage 25-Year - P-1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self-Storage 25-Year
Subarea ID	P-1.1
Area (ac)	1.44
Flow Path Length (ft)	635.0
Flow Path Slope (vft/hft)	0.0036
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.906
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.3558
Peak Intensity (in/hr)	2.2059
Undeveloped Runoff Coefficient (Cu)	0.353
Developed Runoff Coefficient (Cd)	0.8486
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	2.6955
Burned Peak Flow Rate (cfs)	2.6955
24-Hr Clear Runoff Volume (ac-ft)	0.5268
24-Hr Clear Runoff Volume (cu-ft)	22947.0155



Peak Flow Hydrologic Analysis

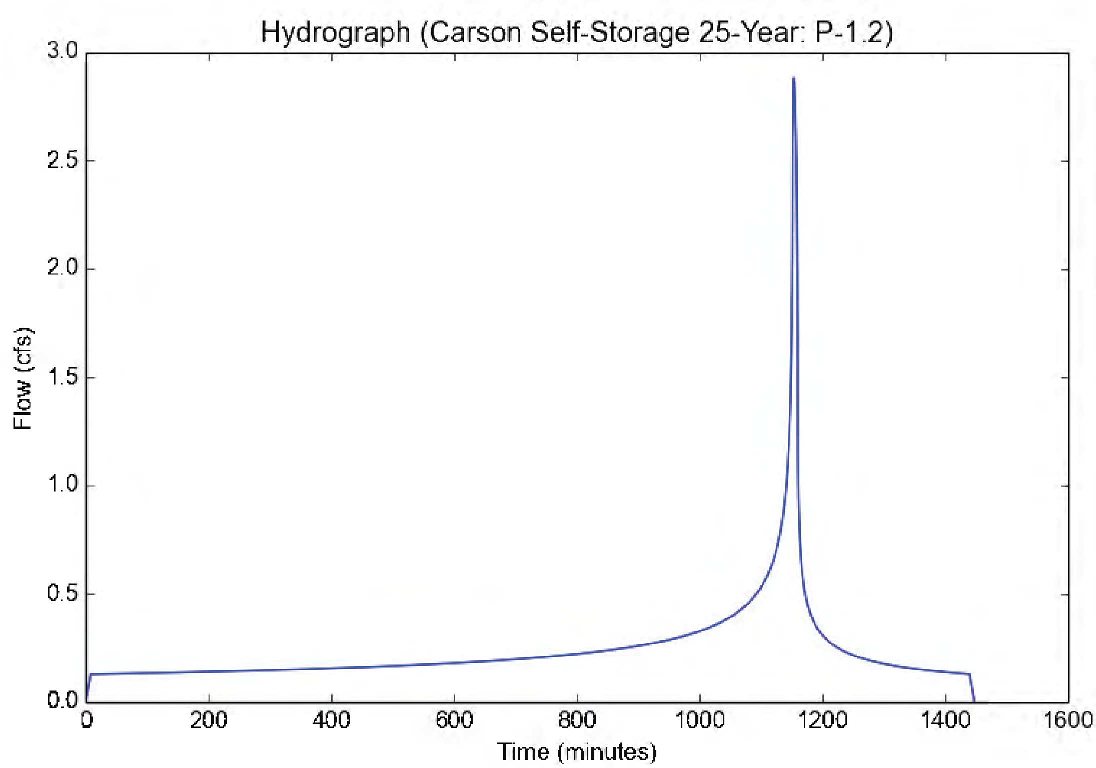
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/25-Year/Carson Self-Storage 25-Year - P-1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self-Storage 25-Year
Subarea ID	P-1.2
Area (ac)	1.33
Flow Path Length (ft)	645.0
Flow Path Slope (vft/hft)	0.0177
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.889
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.3558
Peak Intensity (in/hr)	2.5621
Undeveloped Runoff Coefficient (Cu)	0.4041
Developed Runoff Coefficient (Cd)	0.845
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	2.8792
Burned Peak Flow Rate (cfs)	2.8792
24-Hr Clear Runoff Volume (ac-ft)	0.4788
24-Hr Clear Runoff Volume (cu-ft)	20857.8893



Peak Flow Hydrologic Analysis

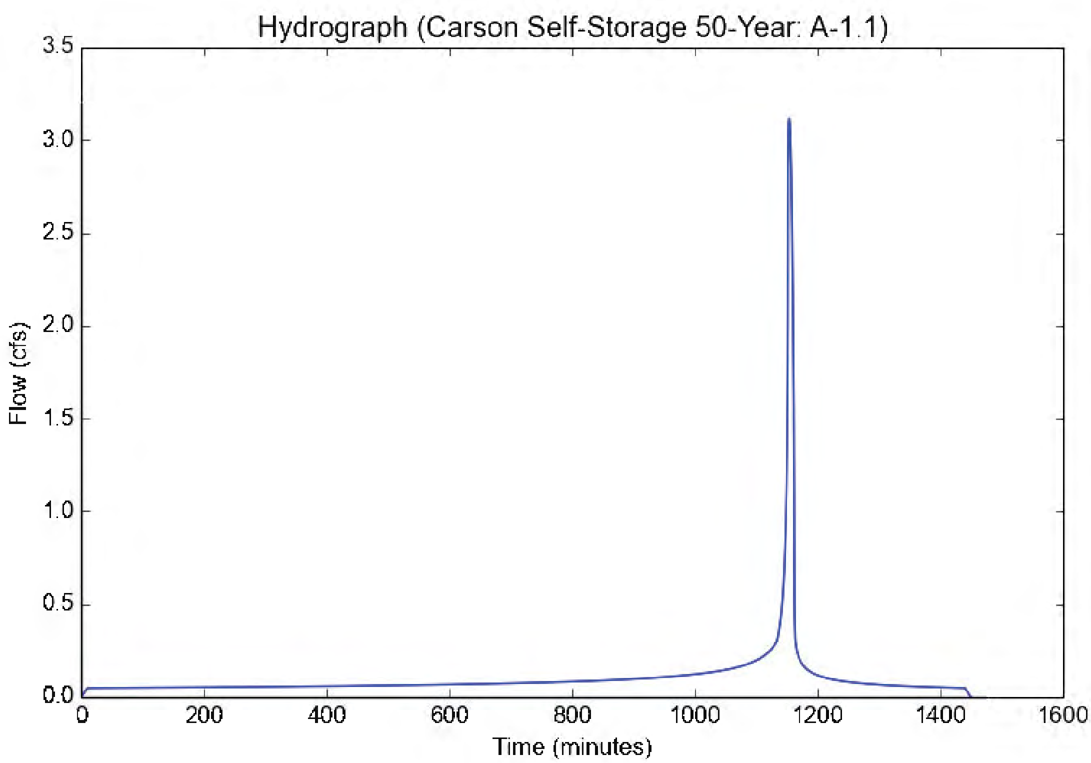
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/50-Year/Carson Self-Storage 50-Year - A-1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self-Storage 50-Year
Subarea ID	A-1.1
Area (ac)	2.77
Flow Path Length (ft)	398.0
Flow Path Slope (vft/hft)	0.007
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.035
Soil Type	3
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	2.6275
Undeveloped Runoff Coefficient (Cu)	0.411
Developed Runoff Coefficient (Cd)	0.4281
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	3.1157
Burned Peak Flow Rate (cfs)	3.1157
24-Hr Clear Runoff Volume (ac-ft)	0.2097
24-Hr Clear Runoff Volume (cu-ft)	9133.0128



Peak Flow Hydrologic Analysis

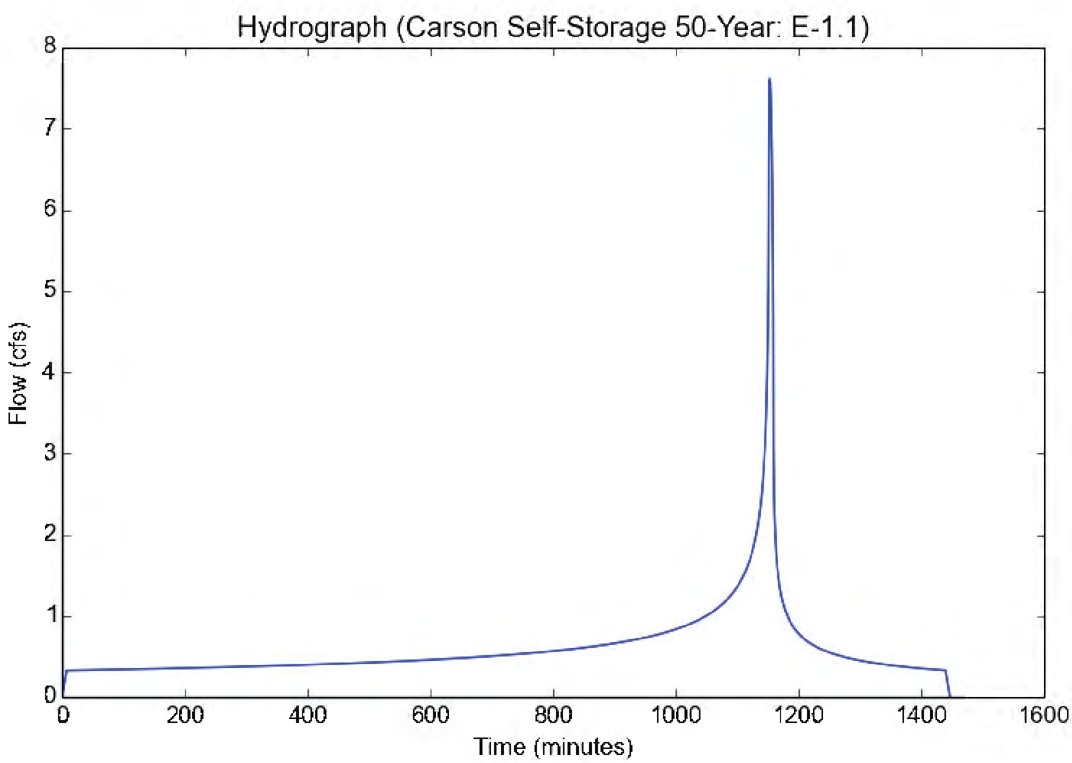
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/50-Year/Carson Self-Storage 50-Year - E-1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self-Storage 50-Year
Subarea ID	E-1.1
Area (ac)	2.77
Flow Path Length (ft)	475.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.964
Soil Type	3
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.1071
Undeveloped Runoff Coefficient (Cu)	0.4613
Developed Runoff Coefficient (Cd)	0.8842
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	7.61
Burned Peak Flow Rate (cfs)	7.61
24-Hr Clear Runoff Volume (ac-ft)	1.2178
24-Hr Clear Runoff Volume (cu-ft)	53047.6479



Peak Flow Hydrologic Analysis

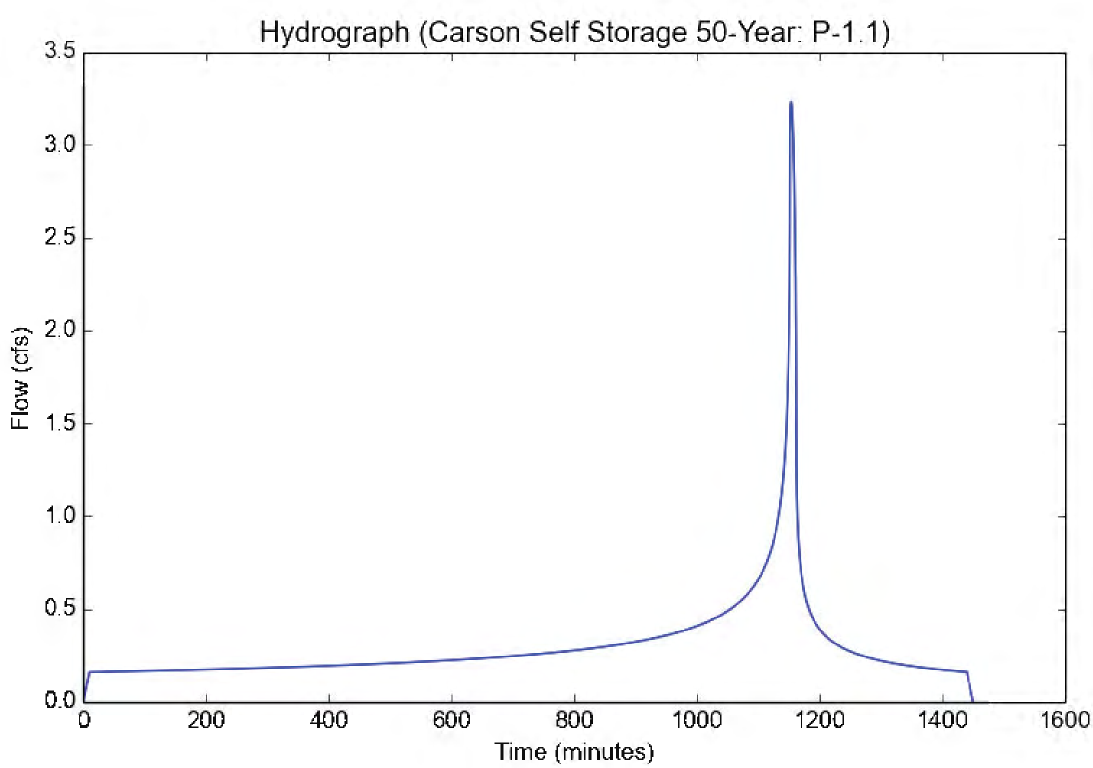
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/50-Year/Carson Self-Storage 50-Year - P-1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self Storage 50-Year
Subarea ID	P-1.1
Area (ac)	1.44
Flow Path Length (ft)	635.0
Flow Path Slope (vft/hft)	0.0036
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.906
Soil Type	3
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	2.6275
Undeveloped Runoff Coefficient (Cu)	0.411
Developed Runoff Coefficient (Cd)	0.854
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	3.2314
Burned Peak Flow Rate (cfs)	3.2314
24-Hr Clear Runoff Volume (ac-ft)	0.6003
24-Hr Clear Runoff Volume (cu-ft)	26150.392



Peak Flow Hydrologic Analysis

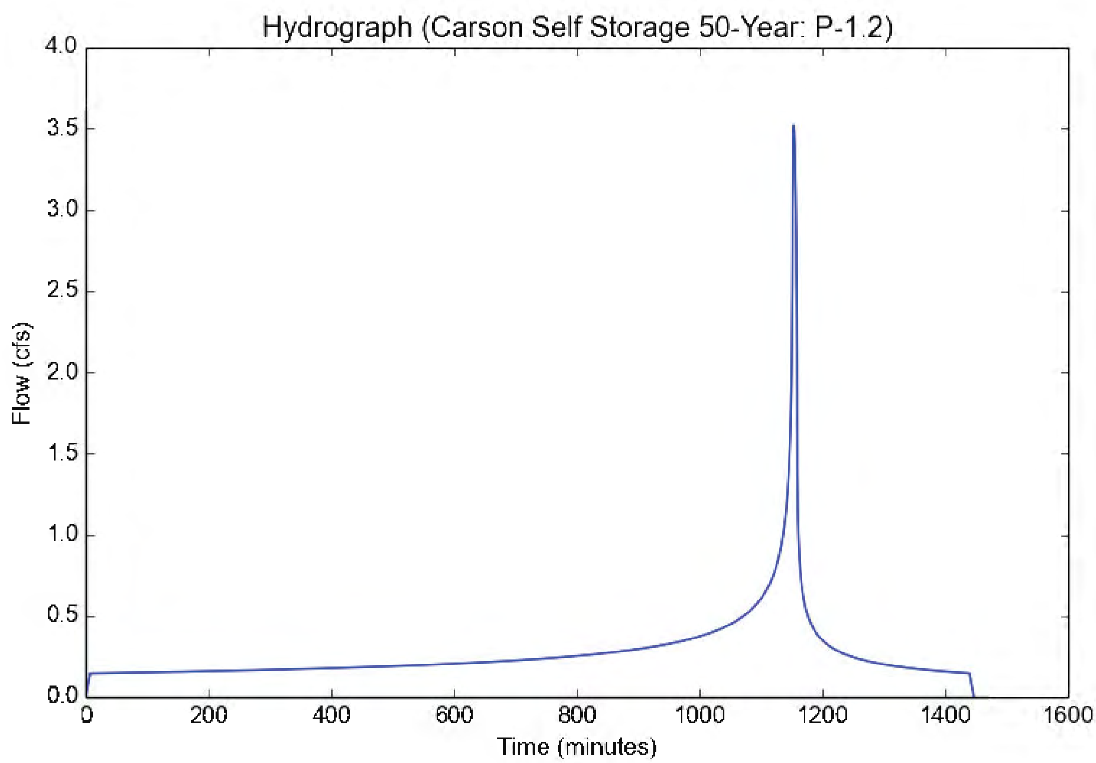
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/50-Year/Carson Self-Storage 50-Year - P-1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self Storage 50-Year
Subarea ID	P-1.2
Area (ac)	1.33
Flow Path Length (ft)	645.0
Flow Path Slope (vft/hft)	0.0177
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.889
Soil Type	3
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.1071
Undeveloped Runoff Coefficient (Cu)	0.4613
Developed Runoff Coefficient (Cd)	0.8513
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	3.518
Burned Peak Flow Rate (cfs)	3.518
24-Hr Clear Runoff Volume (ac-ft)	0.5457
24-Hr Clear Runoff Volume (cu-ft)	23771.3544



Peak Flow Hydrologic Analysis

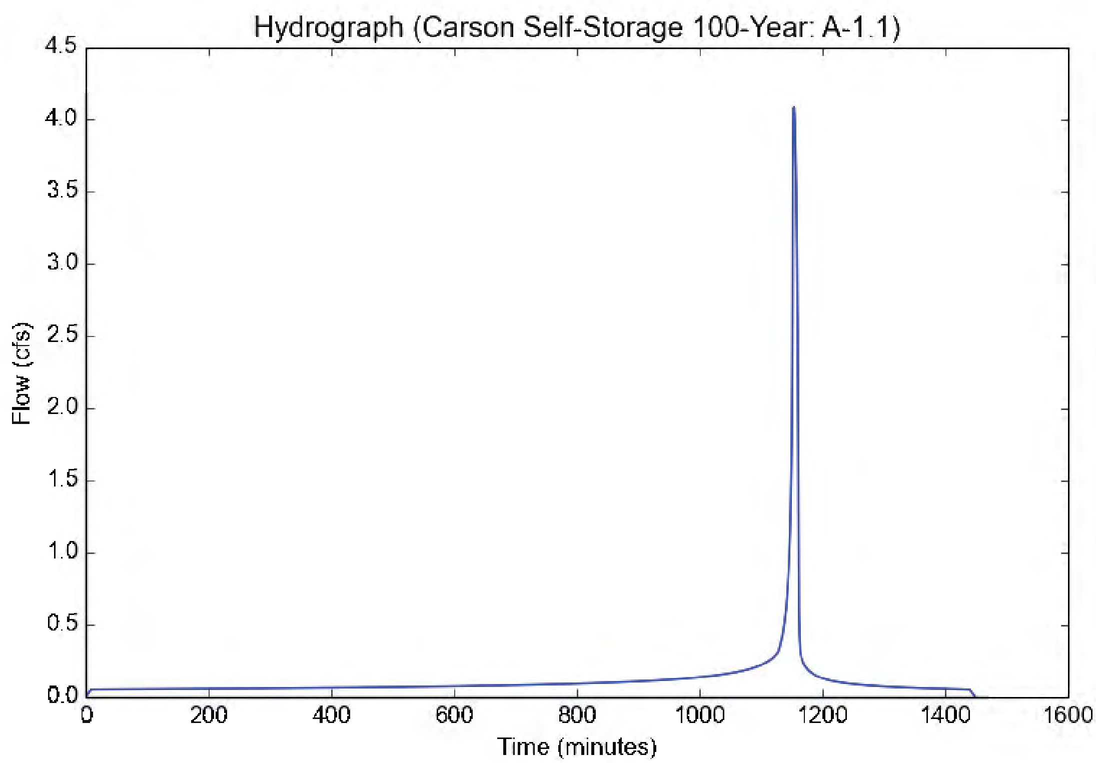
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/100-Year/Carson Self-Storage 100-Year - A
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self-Storage 100-Year
Subarea ID	A-1.1
Area (ac)	2.77
Flow Path Length (ft)	398.0
Flow Path Slope (vft/hft)	0.007
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.035
Soil Type	3
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.8442
Peak Intensity (in/hr)	3.0978
Undeveloped Runoff Coefficient (Cu)	0.4604
Developed Runoff Coefficient (Cd)	0.4757
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	4.0823
Burned Peak Flow Rate (cfs)	4.0823
24-Hr Clear Runoff Volume (ac-ft)	0.2423
24-Hr Clear Runoff Volume (cu-ft)	10556.6976



Peak Flow Hydrologic Analysis

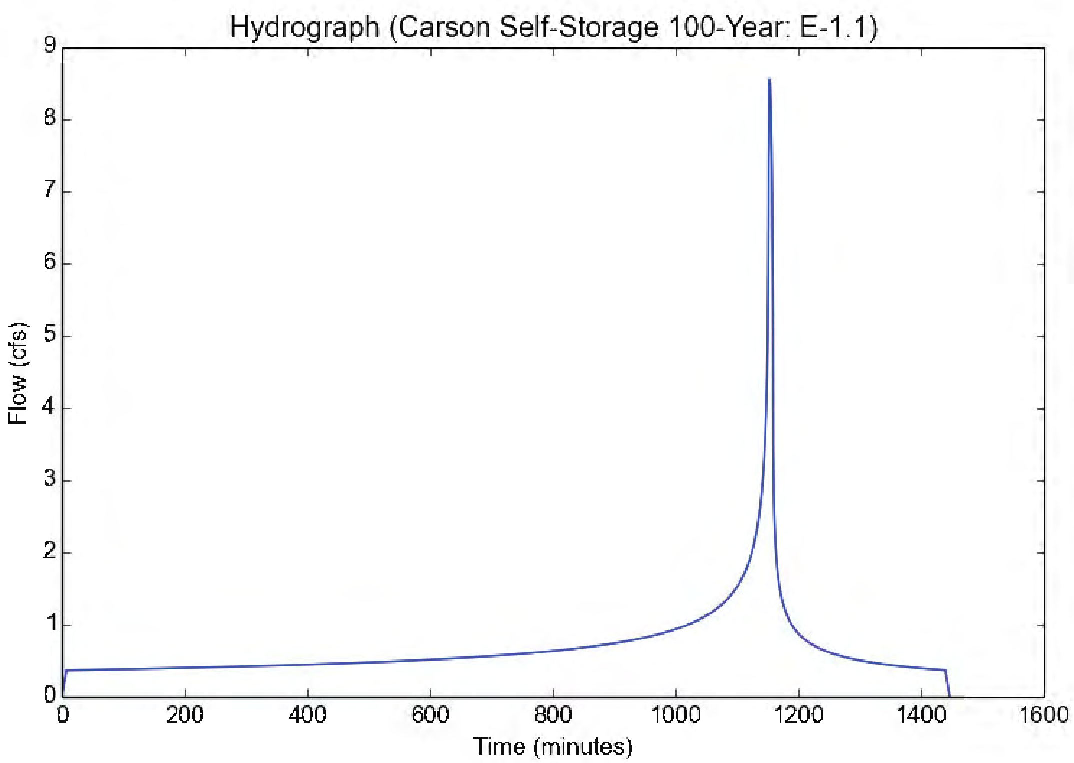
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/100-Year/Carson Self-Storage 100-Year - E
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self-Storage 100-Year
Subarea ID	E-1.1
Area (ac)	2.77
Flow Path Length (ft)	475.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.964
Soil Type	3
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.8442
Peak Intensity (in/hr)	3.4861
Undeveloped Runoff Coefficient (Cu)	0.5012
Developed Runoff Coefficient (Cd)	0.8856
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	8.5523
Burned Peak Flow Rate (cfs)	8.5523
24-Hr Clear Runoff Volume (ac-ft)	1.3666
24-Hr Clear Runoff Volume (cu-ft)	59530.2221



Peak Flow Hydrologic Analysis

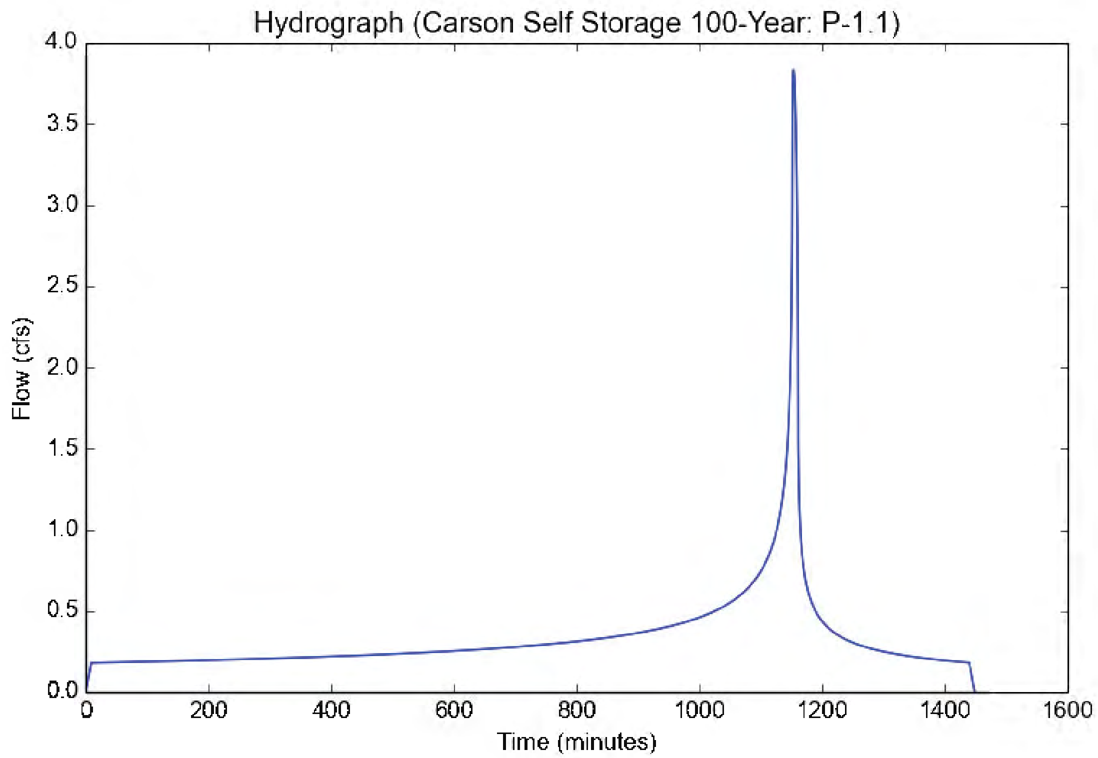
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/100-Year/Carson Self-Storage 100-Year - P
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self Storage 100-Year
Subarea ID	P-1.1
Area (ac)	1.44
Flow Path Length (ft)	635.0
Flow Path Slope (vft/hft)	0.0036
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.906
Soil Type	3
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.8442
Peak Intensity (in/hr)	3.0978
Undeveloped Runoff Coefficient (Cu)	0.4604
Developed Runoff Coefficient (Cd)	0.8587
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	3.8304
Burned Peak Flow Rate (cfs)	3.8304
24-Hr Clear Runoff Volume (ac-ft)	0.6739
24-Hr Clear Runoff Volume (cu-ft)	29356.4034



Peak Flow Hydrologic Analysis

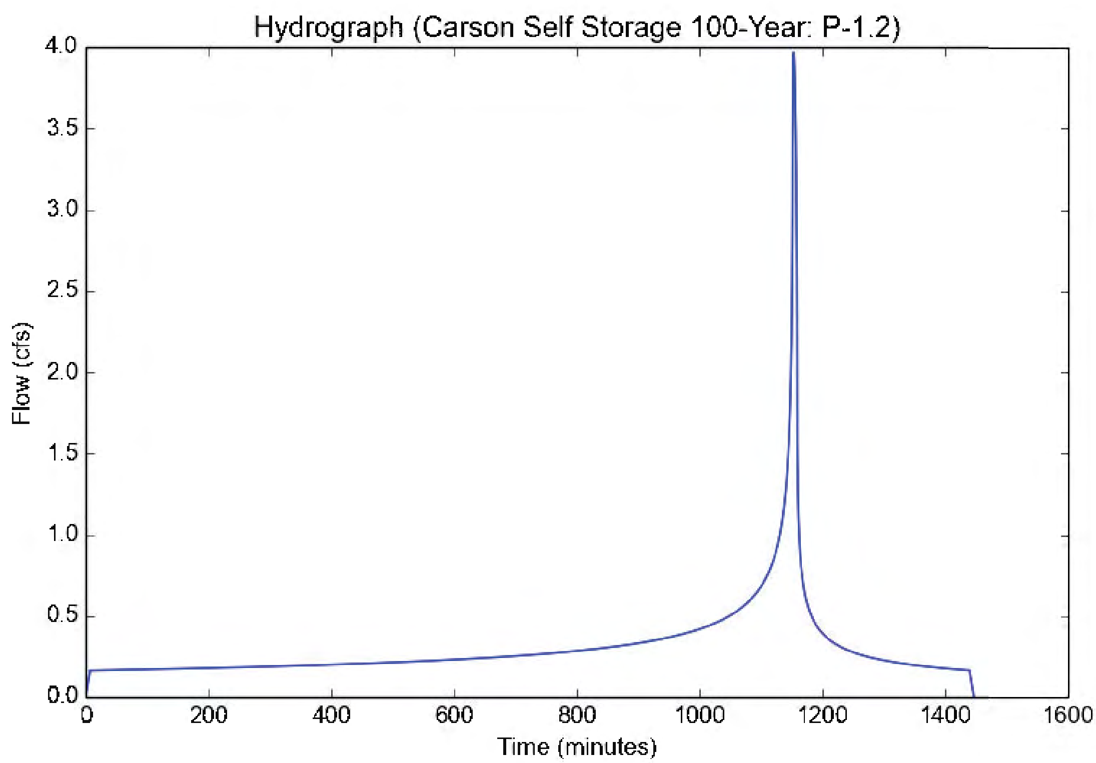
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/H&H/HydroCalc Exhibits/100-Year/Carson Self-Storage 100-Year - P
Version: HydroCalc 1.0.3

Input Parameters

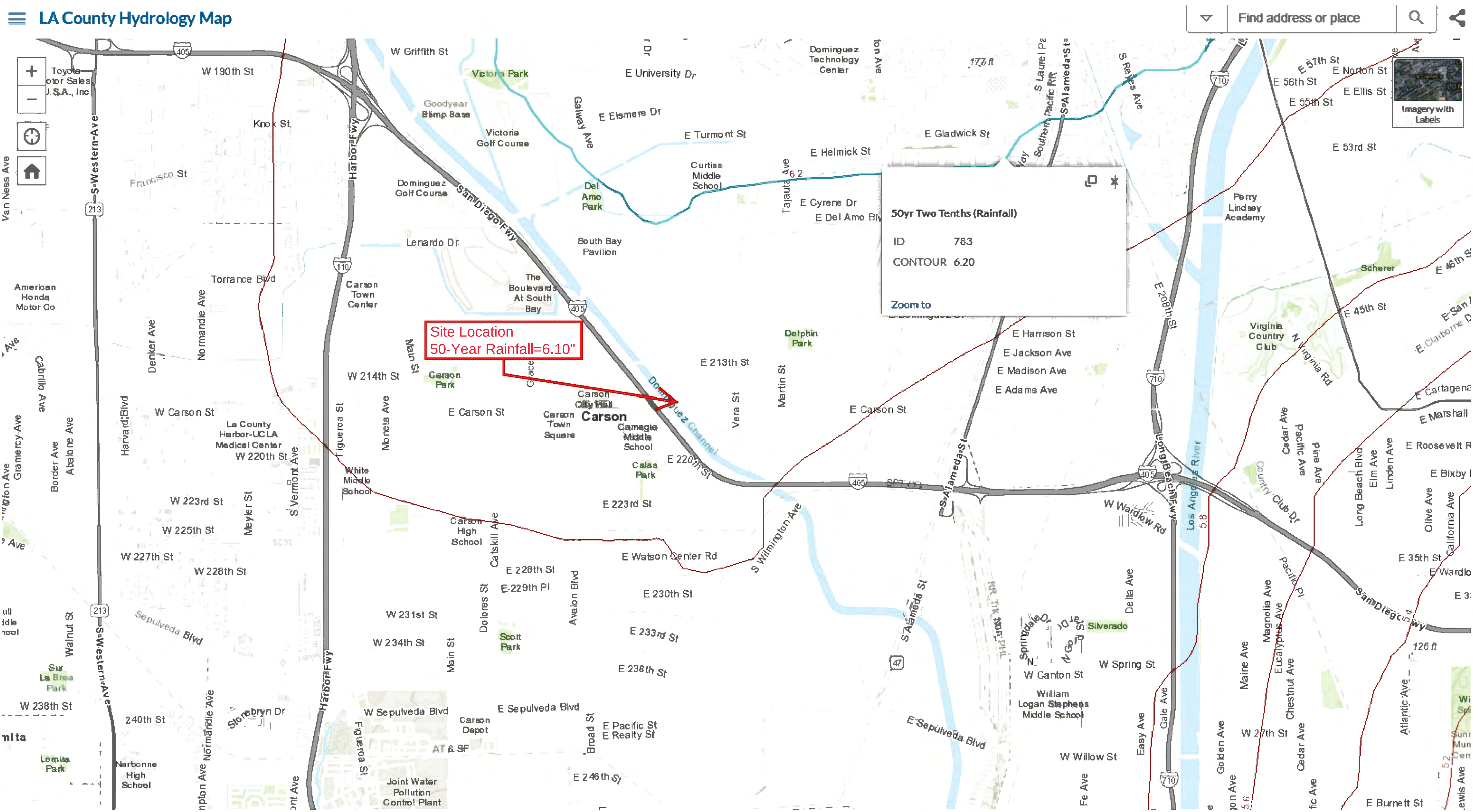
Project Name	Carson Self Storage 100-Year
Subarea ID	P-1.2
Area (ac)	1.33
Flow Path Length (ft)	645.0
Flow Path Slope (vft/hft)	0.0177
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.889
Soil Type	3
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.8442
Peak Intensity (in/hr)	3.4861
Undeveloped Runoff Coefficient (Cu)	0.5012
Developed Runoff Coefficient (Cd)	0.8557
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	3.9676
Burned Peak Flow Rate (cfs)	3.9676
24-Hr Clear Runoff Volume (ac-ft)	0.6127
24-Hr Clear Runoff Volume (cu-ft)	26687.391



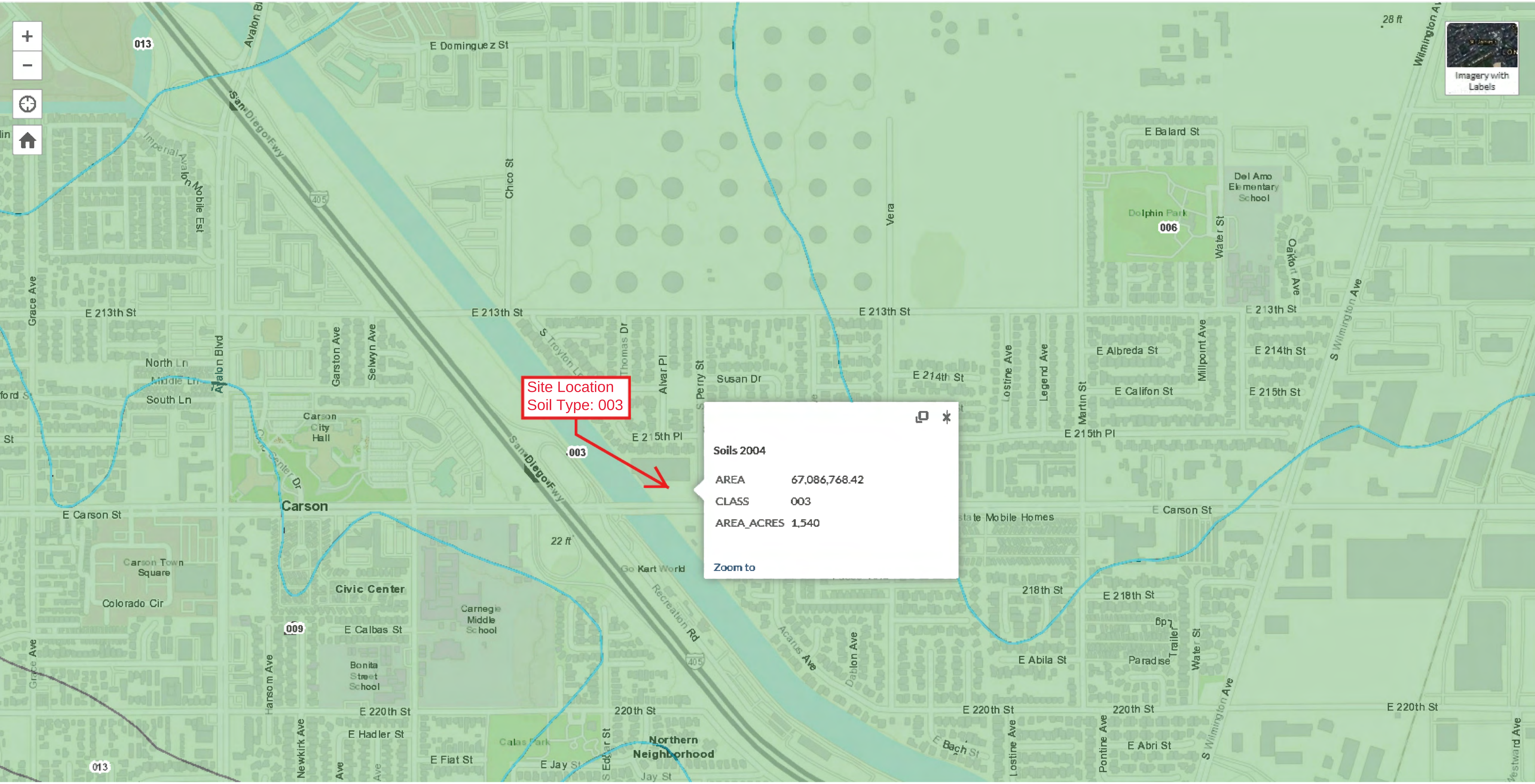
Appendix 1



LA County Hydrology Map
Find address or place
Imagery with Labels
50yr Two Tenths (Rainfall)
ID 783
CONTOUR 6.20
Zoom to
Site Location
50-Year Rainfall=6.10"
Carson
Dominguez Channel
San Diego Fwy
Harbor Fwy
Los Angeles River
Long Beach Fwy
E Carson St
W Carson St
E 223rd St
E Sepulveda Blvd
Torrance Blvd
E Del Amo Blvd
Dominguez Golf Course
Victoria Golf Course
Goodyear Blimp Base
Carson Town Center
Carson City Hall
Carson High School
La County Harbor-UCLA Medical Center
Joint Water Pollution Control Plant
Virginia Country Club
Dolphin Park
Calas Park
Scott Park
Carson Park
6.2
5.8
5.6
5.2
126 ft
177 ft

Appendix 2

LA County Hydrology Map



Appendix 3

CONDUIT SIZING CALCULATIONS

The following chart details the sizing parameters and for conduits that convey runoff on the site.
Flow parameters from *Handbook of Hydraulics, King & Brater* were used, see following page.

K'= Discharge factor	=	$(Q*n)/(d^{8/3}*s^{1/2})$
n= Mannings coefficient	=	0.013 for PVC & HDPE
d=diameter of conduit (ft)	=	per chart
Q= Discharge	=	based off portions of basins tributary to outlet
s=Minimum Pipe Slope (ft/ft)	=	per chart
D=depth of flow	=	From table 7-4 of the *Handbook of Hydraulics, King & Brater* See right
C_a= Flow factor	=	From table 7-14 of the *Handbook of Hydraulics, King & Brater* See right
A=Cross sectional area of flow	=	C_a*d^2
V=Velocity	=	Q/A

Pipe Flow

Pipe	Tributary Areas	Q (cfs)	S (%)	d (in)	K'	D/d	C_a	A (sf)	V (fps)
1	**Entire Site**	7.79	1	18	0.3435	0.64	0.531	1.195	6.52

Table 7-4. For Determining the Area a of the Cross Section of a Circular Conduit Flowing Part Full

Let $\frac{\text{depth of water}}{\text{diameter of channel}} = \frac{D}{d}$ and C_a = the tabulated value. Then $a = C_a d^2$.

$\frac{D}{d}$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.0000	.0013	.0037	.0069	.0105	.0147	.0192	.0242	.0294	.0350
.1	.0409	.0470	.0534	.0600	.0668	.0739	.0811	.0885	.0961	.1039
.2	.1118	.1199	.1281	.1365	.1449	.1535	.1623	.1711	.1800	.1890
.3	.1982	.2074	.2167	.2260	.2355	.2450	.2546	.2642	.2739	.2836
.4	.2934	.3032	.3130	.3229	.3328	.3428	.3527	.3627	.3727	.3827
.5	.393	.403	.413	.423	.433	.443	.453	.462	.472	.482
.6	.492	.502	.512	.521	.531	.540	.550	.559	.569	.578
.7	.587	.596	.605	.614	.623	.632	.640	.649	.657	.666
.8	.674	.681	.689	.697	.704	.712	.719	.725	.732	.738
.9	.745	.750	.756	.761	.766	.771	.775	.779	.782	.784

Table 7-14. Values of K' for Circular Channels in the Formula

$$Q = \frac{K'}{n} d^{8/3} s^{1/2}$$

D = depth of water d = diameter of channel

$\frac{D}{d}$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0		.00007	.00031	.00074	.00138	.00222	.00328	.00455	.00604	.00775
.1	.00967	.0118	.0142	.0167	.0195	.0225	.0257	.0291	.0327	.0366
.2	.0406	.0448	.0492	.0537	.0585	.0634	.0686	.0738	.0793	.0849
.3	.0907	.0966	.1027	.1089	.1153	.1218	.1284	.1352	.1420	.1490
.4	.1561	.1633	.1705	.1779	.1854	.1929	.2005	.2082	.2160	.2238
.5	.232	.239	.247	.255	.263	.271	.279	.287	.295	.303
.6	.311	.319	.327	.335	.343	.350	.358	.366	.373	.380
.7	.388	.395	.402	.409	.416	.422	.429	.435	.441	.447
.8	.453	.458	.463	.468	.473	.477	.481	.485	.488	.491
.9	.494	.496	.497	.498	.498	.498	.496	.494	.489	.483
1.0	.463									

Appendix 4

Channel Report

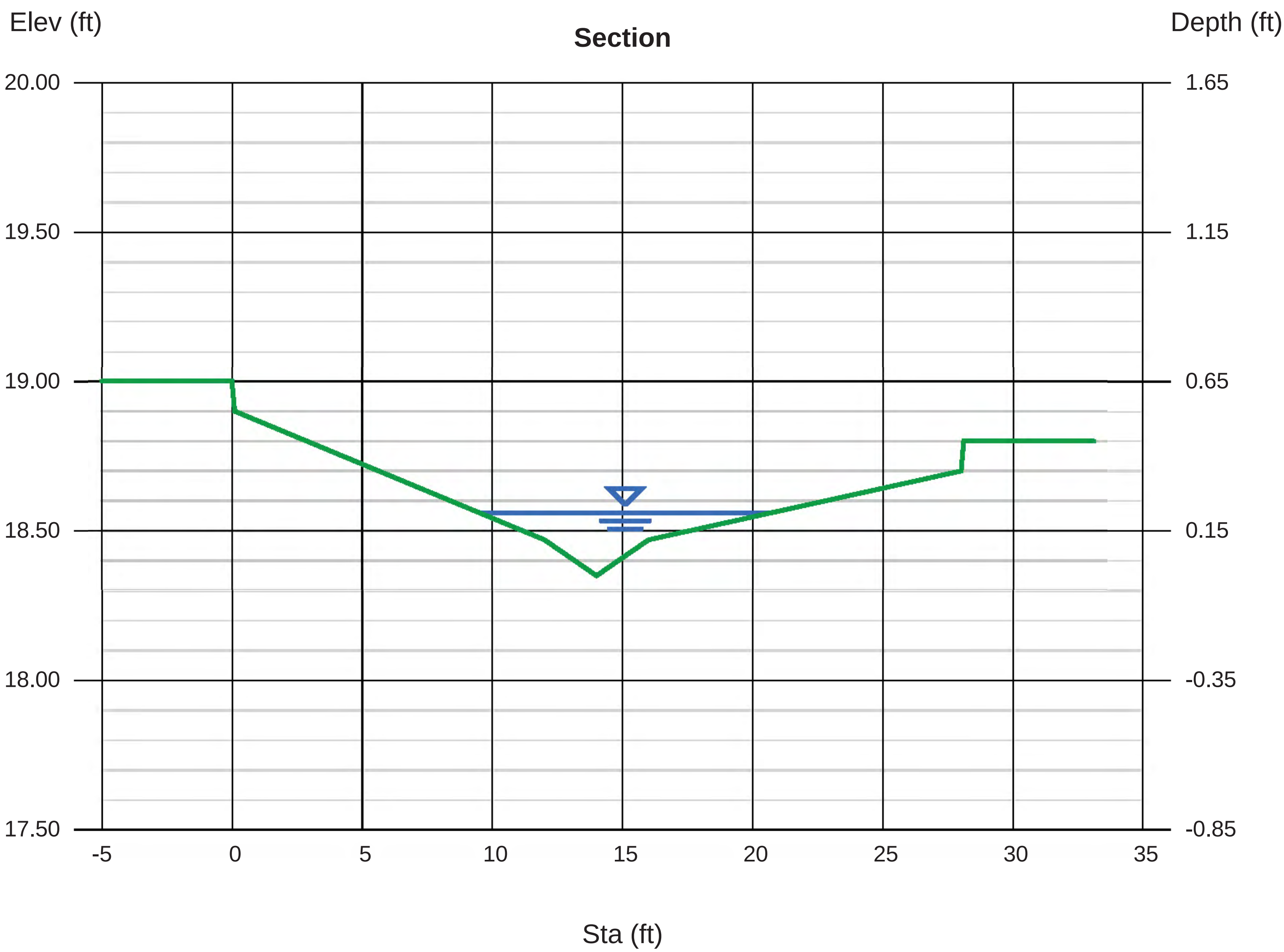
Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, May 20 2021

Section A-A Gutter Analysis

User-defined		**Highlighted**	
Invert Elev (ft)	= 18.35	Depth (ft)	= 0.21
Slope (%)	= 4.00	Q (cfs)	= 3.930
N-Value	= 0.013	Area (sqft)	= 0.92
		Velocity (ft/s)	= 4.26
Calculations		Wetted Perim (ft)	= 11.20
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.29
Known Q (cfs)	= 3.93	Top Width (ft)	= 11.19
		EGL (ft)	= 0.49

(Sta, El, n)-(Sta, El, n)...

(0.00, 19.00)-(0.10, 18.90, 0.013)-(12.00, 18.47, 0.013)-(14.00, 18.35, 0.013)-(16.00, 18.47, 0.013)-(28.00, 18.70, 0.013)-(28.10, 18.80, 0.013)



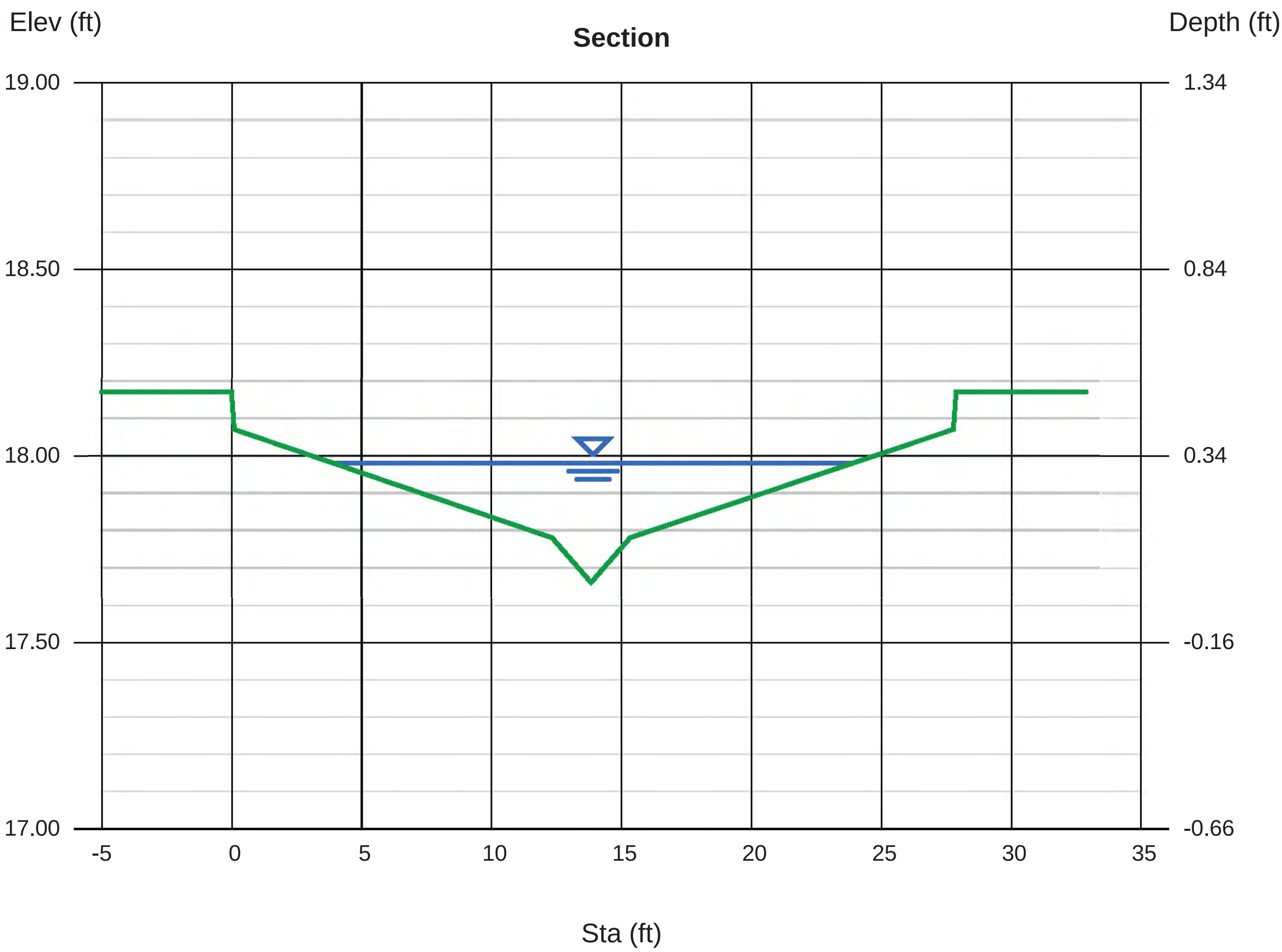
Channel Report

Section B-B Gutter Analysis

User-defined		**Highlighted**	
Invert Elev (ft)	= 17.66	Depth (ft)	= 0.32
Slope (%)	= 0.35	Q (cfs)	= 3.930
N-Value	= 0.013	Area (sqft)	= 2.48
		Velocity (ft/s)	= 1.58
Calculations		Wetted Perim (ft)	= 20.03
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.30
Known Q (cfs)	= 3.93	Top Width (ft)	= 20.01
		EGL (ft)	= 0.36

(Sta, El, n)-(Sta, El, n)...

(0.00, 18.17)-(0.10, 18.07, 0.013)-(12.33, 17.78, 0.013)-(13.83, 17.66, 0.013)-(15.33, 17.78, 0.013)-(27.77, 18.07, 0.013)-(27.87, 18.17, 0.013)



Channel Report

Section C-C Gutter Analysis

User-defined		**Highlighted**	
Invert Elev (ft)	= 17.32	Depth (ft)	= 0.35
Slope (%)	= 0.55	Q (cfs)	= 3.930
N-Value	= 0.013	Area (sqft)	= 1.81
		Velocity (ft/s)	= 2.18
Calculations		Wetted Perim (ft)	= 13.18
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.36
Known Q (cfs)	= 3.93	Top Width (ft)	= 13.03
		EGL (ft)	= 0.42

(Sta, El, n)-(Sta, El, n)...
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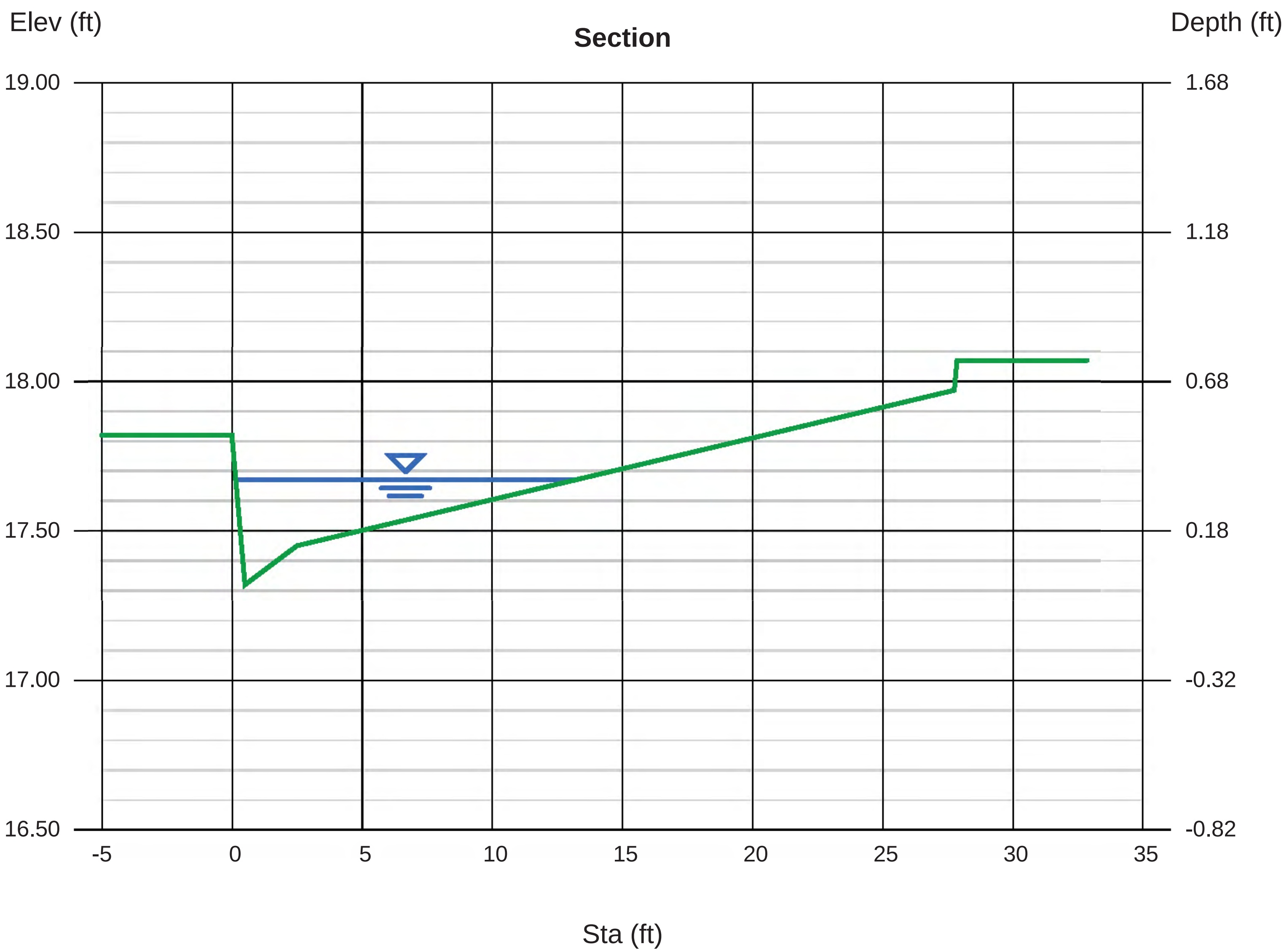


Channel Report

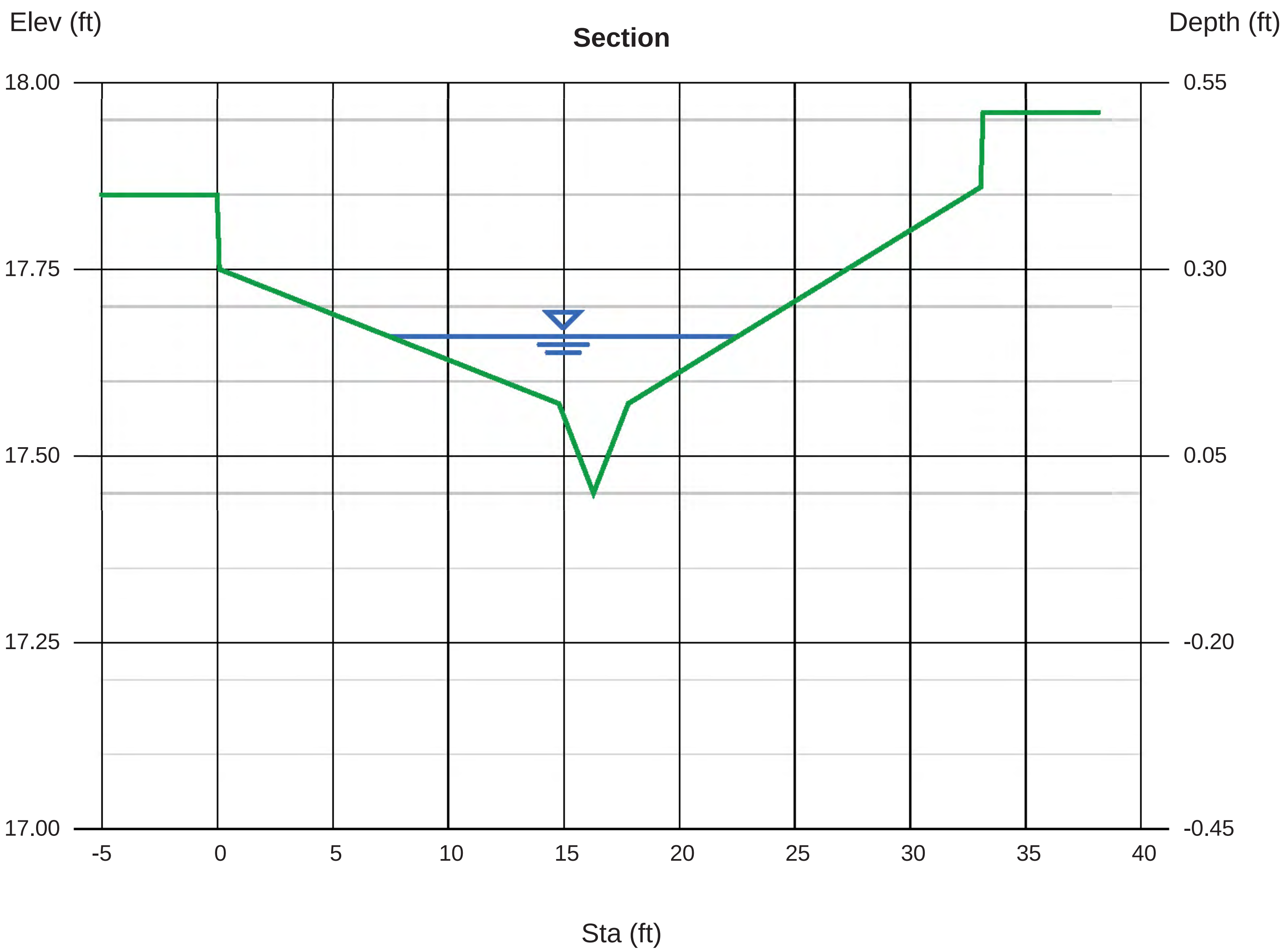
Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, May 20 2021

Section D-D Gutter Analysis

User-defined		**Highlighted**	
Invert Elev (ft)	= 17.45	Depth (ft)	= 0.21
Slope (%)	= 5.40	Q (cfs)	= 3.930
N-Value	= 0.013	Area (sqft)	= 0.99
		Velocity (ft/s)	= 3.96
Calculations		Wetted Perim (ft)	= 15.09
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.28
Known Q (cfs)	= 3.93	Top Width (ft)	= 15.08
		EGL (ft)	= 0.45

(Sta, El, n)-(Sta, El, n)...

(0.00, 17.85)-(0.10, 17.75, 0.013)-(14.79, 17.57, 0.013)-(16.29, 17.45, 0.013)-(17.79, 17.57, 0.013)-(33.05, 17.86, 0.013)-(33.15, 17.96, 0.013)

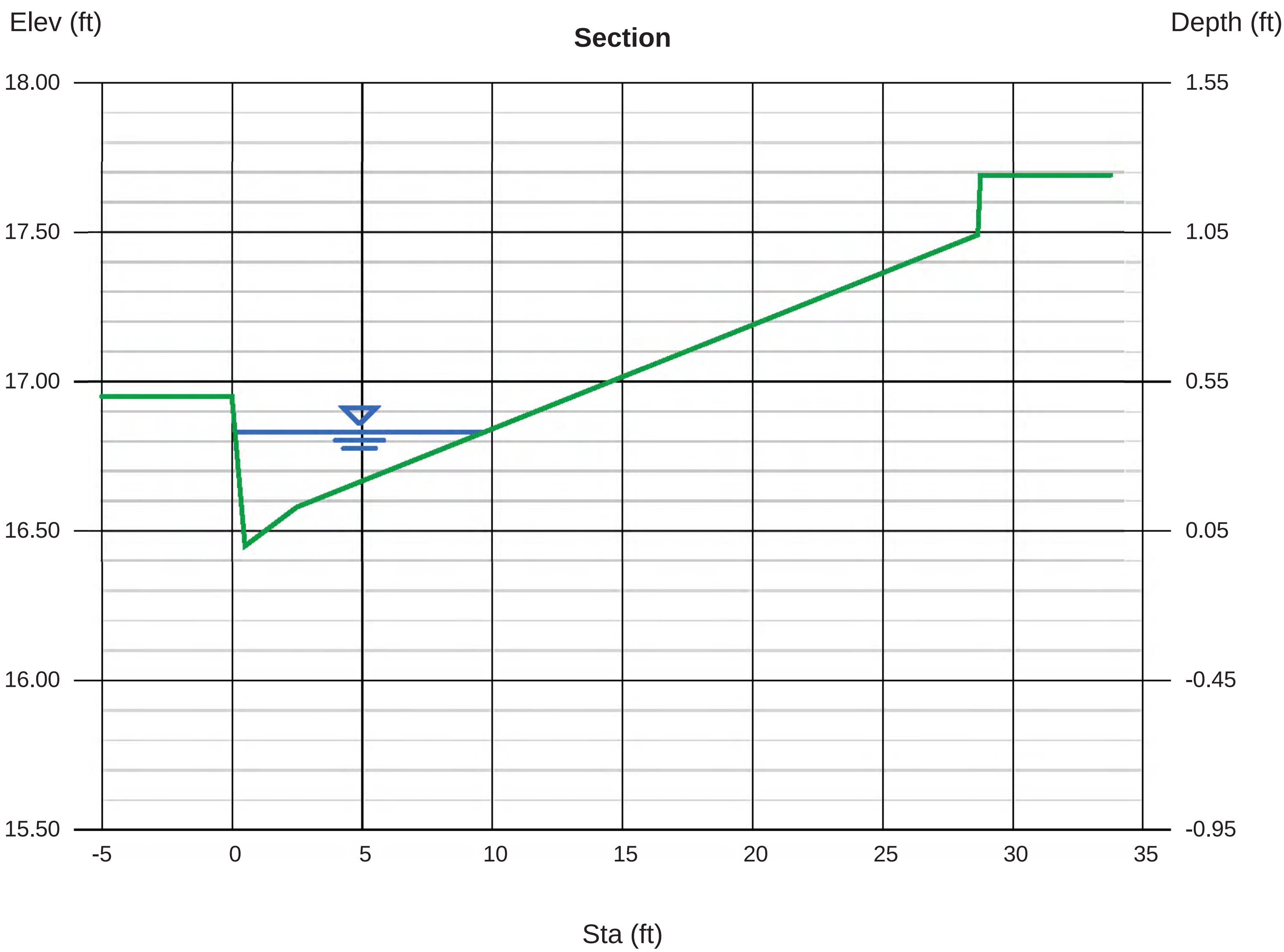


Channel Report

Section E-E Gutter Analysis

User-defined		**Highlighted**	
Invert Elev (ft)	= 16.45	Depth (ft)	= 0.38
Slope (%)	= 0.50	Q (cfs)	= 3.850
N-Value	= 0.013	Area (sqft)	= 1.60
		Velocity (ft/s)	= 2.41
Calculations		Wetted Perim (ft)	= 9.73
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.39
Known Q (cfs)	= 3.85	Top Width (ft)	= 9.56
		EGL (ft)	= 0.47

(Sta, El, n)-(Sta, El, n)...
(0.00, 16.95)-(0.50, 16.45, 0.013)-(2.50, 16.58, 0.013)-(28.65, 17.49, 0.013)-(28.75, 17.69, 0.013)



Channel Report

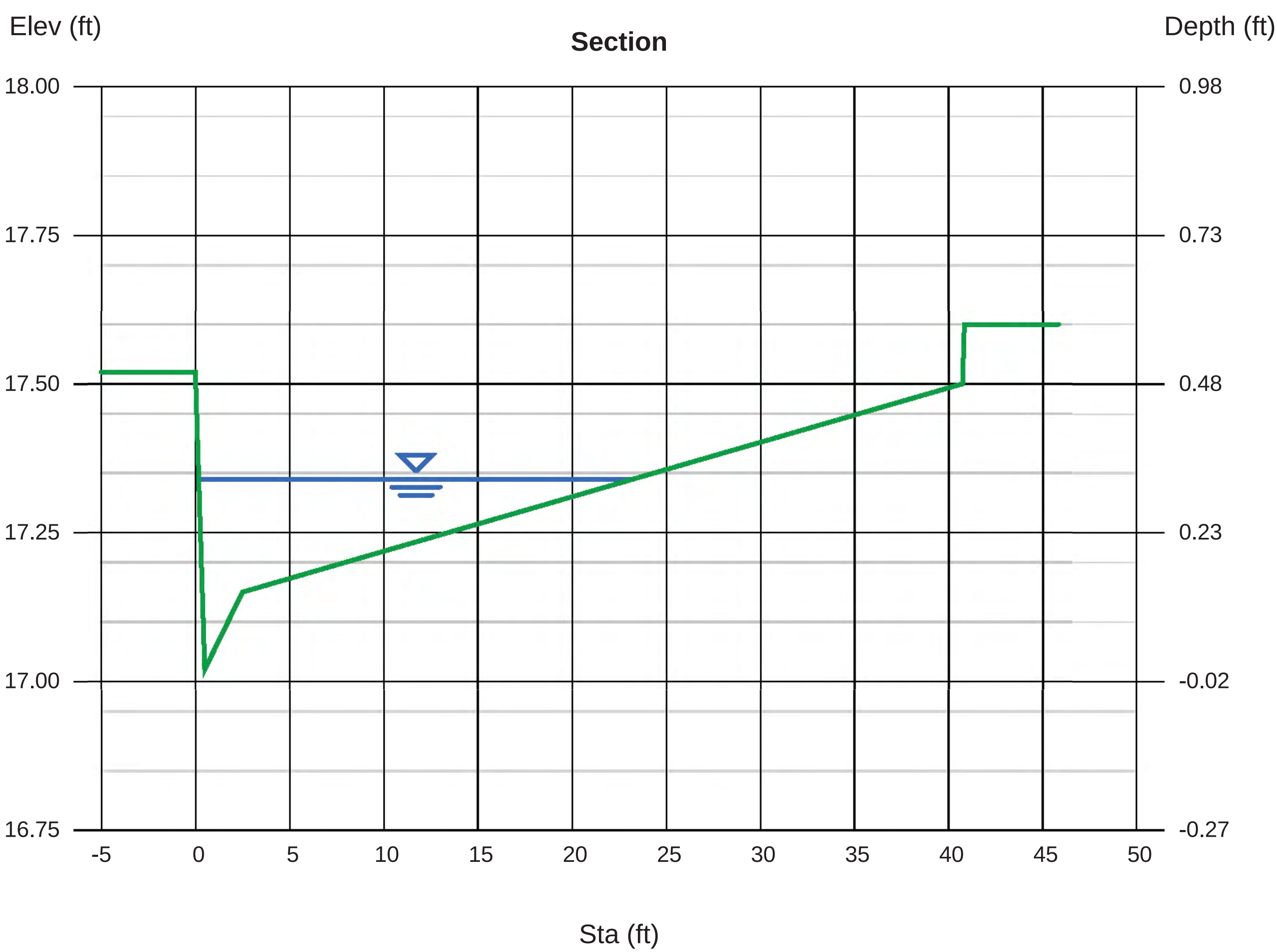
Section F-F Gutter Analysis

User-defined
Invert Elev (ft) = 17.02
Slope (%) = 0.35
N-Value = 0.013

Calculations
Compute by: Known Q
Known Q (cfs) = 3.85

(Sta, El, n)-(Sta, El, n)...
(0.00, 17.52)-(0.50, 17.02, 0.013)-(2.50, 17.15, 0.013)-(40.73, 17.50, 0.013)-(40.83, 17.60, 0.013)

Highlighted
Depth (ft) = 0.32
Q (cfs) = 3.850
Area (sqft) = 2.53
Velocity (ft/s) = 1.52
Wetted Perim (ft) = 23.21
Crit Depth, Yc (ft) = 0.31
Top Width (ft) = 23.07
EGL (ft) = 0.36



Low Impact Development Plan
(LID Plan)

Project Name:

Carson Self-Storage

21611 South Perry St.

Carson, CA 90745

Prepared for:

21611 PERRY STREET LLC

4132 Katella Avenue, #205b

Los Alamitos, Ca 90720

Prepared by:

Omega Engineering Consultants

4340 Viewridge Avenue, Suite B

San Diego, Ca 92123

(858) 634-8620

PE Stamp & Sign Here

October 5, 2021

Project Owner's Certification

I certify under penalty of law that this document and all attachments were prepared under my jurisdiction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathered the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Applicant's Name:	Darren Embry		
Applicant's Title:	VP of Community Development		
Company:	21611 Perry Street, LLC		
Address:	4132 Katella Avenue, #205B Los Alamitos, CA 90720		
Email:	darren@faring.com		
Telephone No:	(323) 481-9178		
Signature:		Date:	10/12/21

Preparer (Engineer) Certification

Engineer's Name:	Patric de Boer		
Engineer's Title:	Project Engineer		
Company:	Omega Engineering Consultants		
Address:	4340 Viewridge Avenue, Suite B, San Diego, CA 90069		
Email:	patric@omega-consultants.com		
Telephone No:	(858) 634-8620		
I hereby certify that this Low Impact Development Plan is in compliance with, and meets the requirements set forth in, Order No. R4-2012-0175, of the Los Angeles Regional Water Quality Control Board.			
Engineer's Signature	Patric de Boer	Date	5/20/2021
Place Stamp Here	REGISTERED PROFESSIONAL ENGINEER PATRIC T DEBOER No.83583 CIVIL STATE OF CALIFORNIA		

Table of Contents

Attachments

1. PROJECT DESCRIPTION

1.1. PROJECT CATEGORY

Category	YES	NO
1. Development [a] of a new project equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet of impervious area [b]	☒	☐
2. Development [a] of a new industrial park with 10,000 square feet or more of surface area [c]	☐	☒
3. Development [a] of a new commercial mall with 10,000 square feet or more surface area [c]	☐	☒
4. Development [a] of a new retail gasoline outlet with 5,000 square feet or more of surface area [c]	☐	☒
5. Development [a] of a new restaurant (SIC 5812) with 5,000 square feet or more of surface area [c]	☐	☒
6. Development [a] of a new parking lot with either 5,000 ft^2 or more of impervious area [b] or with 25 or more parking spaces	☐	☒
7. Development [a] of a new automotive service facility (SIC 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) with 5,000 square feet or more of surface area [c]	☐	☒
8. Projects located in or directly adjacent to, or discharging directly to a Significant Ecological Area (SEA),[d] where the development will: a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and b. Create 2,500 square feet or more of impervious area [b]	☐	☒
9. Redevelopment [e] of 5,000 square feet or more in one of the categories listed above **If yes, list redevelopment category here:**	☐	☒
10. Redevelopment [e] of 10,000 square feet or more to a Single Family Home, without a change in landuse.	☐	☒

a Development includes any construction or demolition activity, clearing, grading, grubbing, or excavation or any other activity that results in land disturbance.
b Surfaces that do not allow stormwater runoff to percolate into the ground. Typical impervious surfaces include: concrete, asphalt, roofing materials, etc.
c The surface area is the total footprint of an area. Not to include the cumulative area above or below the ground surface.
d An area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and would be disturbed or degraded by human activities and developments. Also, an area designated by the City as approved by the Regional Water Quality Control Board.
e Land-disturbing activities that result in the creation, addition, or replacement of a certain amount of impervious surface area on an already developed site. If the activity results in an alteration to more than 50% of the impervious surface area on the already developed site and the existing site was not subject to post-construction storm water quality control requirements, then the entire site must be mitigated.

1.2. PROJECT DESCRIPTION

Total Project Area (ft^2): 120,644

Total Project Area (Ac): 2.77

EXISTING CONDITIONS

Condition	Area (ft^2)	Percentage (%)
Pervious Area:	4,322	3.6
Impervious Area:	116,322	96.4

PROPOSED CONDITIONS

Condition	Area (ft^2)	Percentage (%)
Pervious Area:	12,134	10.2
Impervious Area:	108,285	89.8

SITE CHARACTERISTICS

DRAINAGE PATTERNS/CONNECTIONS	Existing: The site is currently a vacant, mass graded lot. The site is relatively level with drainage consisting of surface flow. The site drains towards the west to an existing 5' storm drain inlet that outlets directly to the Dominguez Channel thence to Long Beach Harbor and ultimately to the Pacific Ocean.
	Proposed: The site will drain from east to west via gutters that wrap around the proposed self-storage facilities. The runoff generated from the entire site will be treated by a proposed 10'x20' Modular Wetland System that will discharge via an 18" pipe to the existing 5' storm drain inlet. The discharge point will remain the same as the existing conditions.
NARRATIVE PROJECT DESCRIPTION:	The project consists of the construction of a two-story self-storage facility with asphalt drive aisles. The site address is 21611 South Perry St. in Carson, CA 90745.

OFFSITE RUNON	No off-site run-on is anticipated to be received by the site.
UTILITY AND INFRASTRUCTURE INFORMATION	Site is currenly a vacant lot. No utilities are anticipated on-site.
SIGNIFICANT ECOLOGICAL AREAS (SEAS)	N/A

1.3. Hydromodification Analysis

Does the proposed project fall into one of the following categories? Check Yes/No.	Yes	No
1. *Project is a redevelopment that decreases the effective impervious area compared to the pre-project conditions.*	☐	☒
Describe:		
2. *Project is a redevelopment that increases the infiltration capacity of pervious areas compared to the pre-project conditions.*	☐	☒
Describe:		
3. *Project discharges directly or via a storm drain to a sump, lake, area under tidal influence, into a waterway that has a 100-year peak flow (Q_{100}) of 25,000 cfs or more.*	☒	☐
Describe:		
4. *Project discharges directly or via a storm drain into concrete or otherwise engineered (not natural) channels (e.g., channelized or armored with rip rap, shotcrete, etc.), which, in turn, discharge into receiving water that is not susceptible to hydromodification impacts.*	☒	☐
Describe: Project discharges directly to the Dominguez channel, a concrete-lined channel.		

Hydromodification Analysis

Project is hydromodification exempt.

1.4. PROPERTY OWNERSHIP/MANAGEMENT

	21611 Perry Street LLC 4132 Katella Avenue, #205B Los Alamitos, CA 90720

2. Best Management Practices (BMPs)

2.1. Site Design

85TH Percentile, 24-Hour Storm Depth	0.80"
Site Design	The project proposes a 10'x20' Modular Wetland System to treat the entire site prior to discharging to the Dominguez Channel.

BMP List

DMA Designation	Square Footage (SF)	Acreage (Ac)	Storm Water Quality Design Flowrate (SWQDQ, CFS)	BMP Type	BMP Provided Flowrate (CFS)	GPS Coordinates
DMA-1	120,644	2.77	0.702	10'X20' MWS	0.710	33°49'56.58"N 118°15'15.60"W

2.2. BMP SELECTION

2.2.1. INFILTRATION BMPS

NAME	INCLUDED
Bioretention without underdrains	☐
Infiltration Trench	☐
Infiltration Basin	☐
Drywell	☐
Proprietary Subsurface Infiltration Gallery	☐
Permeable Pavement (concrete, asphalt, pavers)	☐
Other:	☐
Other:	☐

DESCRIPTION	Per the Geotechnical Report, "Based on the shallow groundwater and impermeable nature of the fine grained soils which underly the site, infiltration of stormwater at this site is not considered feasible. Infiltration of stormwater at this site would be considered detrimental to the project.”
CALCULATIONS	N/A

2.2.2. RAINWATER HARVEST AND USE BMPS

NAME	INCLUDED
Above-ground cisterns and basins	☐
Underground detention	☐
Other:	☐
Other:	☐
Other:	☐

DESCRIPTION	The proposed site has a low demand for harvested rainwater…
CALCULATIONS	N/A

2.2.3. ALTERNATIVE COMPLIANCE BMPS

BIOFILTRATION BMPS
(If Infiltration BMPs and Rainwater Harvest and Use BMPs are Infeasible)

NAME	INCLUDED
Bioretention with underdrains (i.e. planter box, rain garden, etc.)	☐
Constructed Wetland	☐
Vegetated Swale	☐
Vegetated Filter Strip	☐
Tree-Well Filter	☐
Other:	☐
Other:	☐

DESCRIPTION	N/A
CALCULATIONS	N/A

OFFSITE BMPS

(If Infiltration BMPs, Rainwater Harvest and Use BMPs, and Biofiltration BMPs are Infeasible)

NAME	INCLUDED
Offsite Infiltration	☐
Ground Water Replenishment Projects	☐
Offsite Project - Retrofit Existing Development	☐
Regional Storm Water Mitigation Program	☐
Other:	☐
Other:	☐

DESCRIPTION	N/A
CALCULATIONS	N/A

2.2.4. TREATMENT CONTROL BMPS

NAME	INCLUDED
Media Filter	☐
Filter Insert	☐
CDS Unit	☐
Other: Flow-through modular treatment system	☒
Other:	☐

DESCRIPTION	Project proposes a 10’x20’ Modular Wetland System to treat the entire site. See below for calculations regarding the sizing of the Modular Wetland System. <u>BMP Sizing Calculations</u>: Tributary Area: 2.77 acres Intensity$_{1yr,\ 1hr}$: 0.31” Runoff Coefficient: 0.818 Required Flowrate/Discharge rate: Q=C*I*A = 0.702 cfs BMP Flowrate: 0.710 cfs

2.2.5. Hydromodification Control BMPs

Name	Included
Infiltration System	☐
Above-ground Cistern	☐
Above-ground Basin	☐
Underground Detention	☐
Other:	☐
Other:	☐

Description	N/A
Calculations	N/A

2.2.6. Non-structural Source Control BMPs

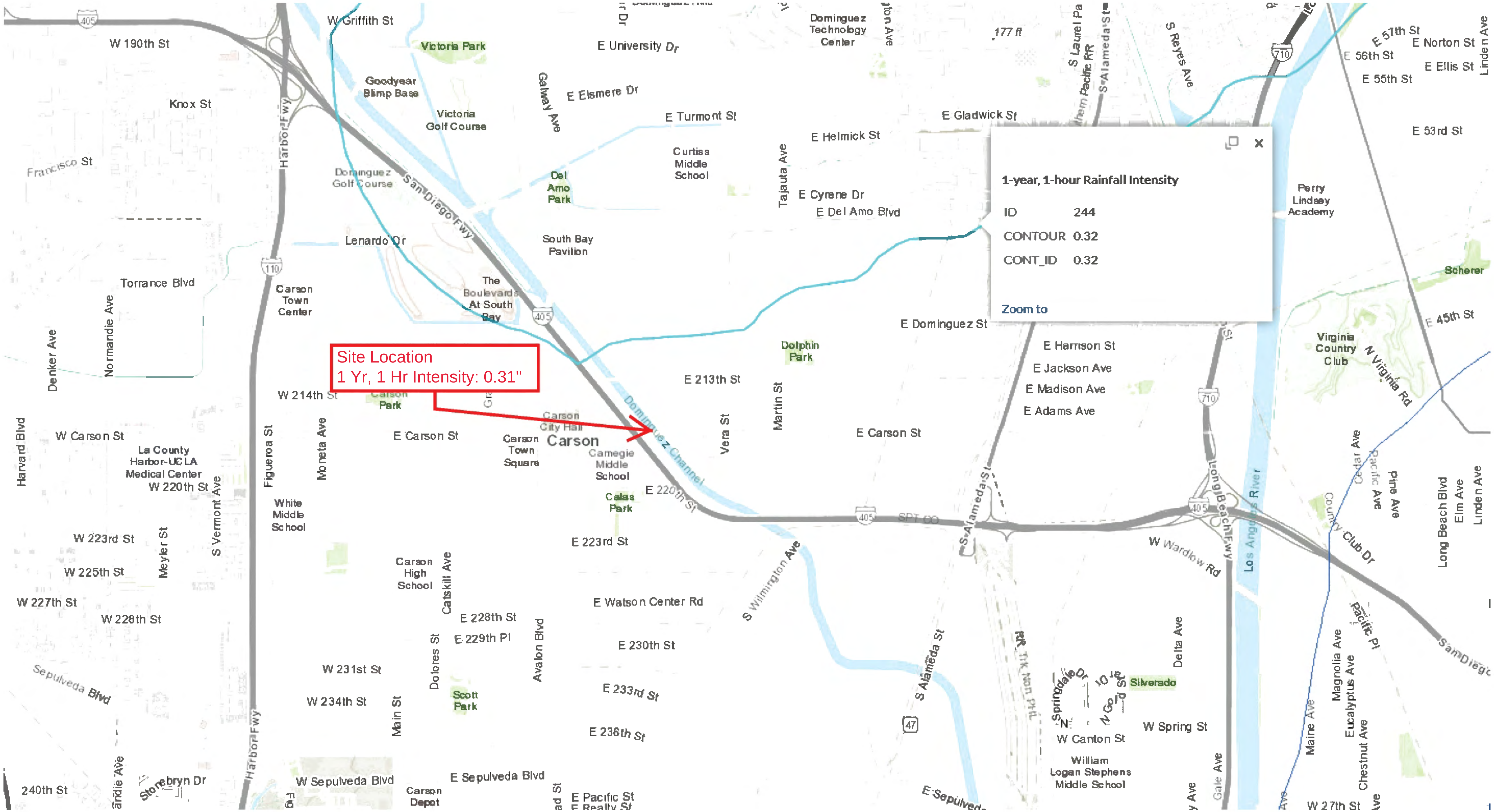
Name	Check One	
	Included	Not Applicable
Education for Property Owners, Tenants and Occupants	☒	☐
Activity Restrictions	☒	☐
Common Area Landscape Management	☒	☐
Common Area Litter Control	☒	☐
Housekeeping of Loading Docks	☐	☒
Common Area Catch Basin Inspection	☒	☐
Street Sweeping Private Streets and Parking Lots	☒	☐

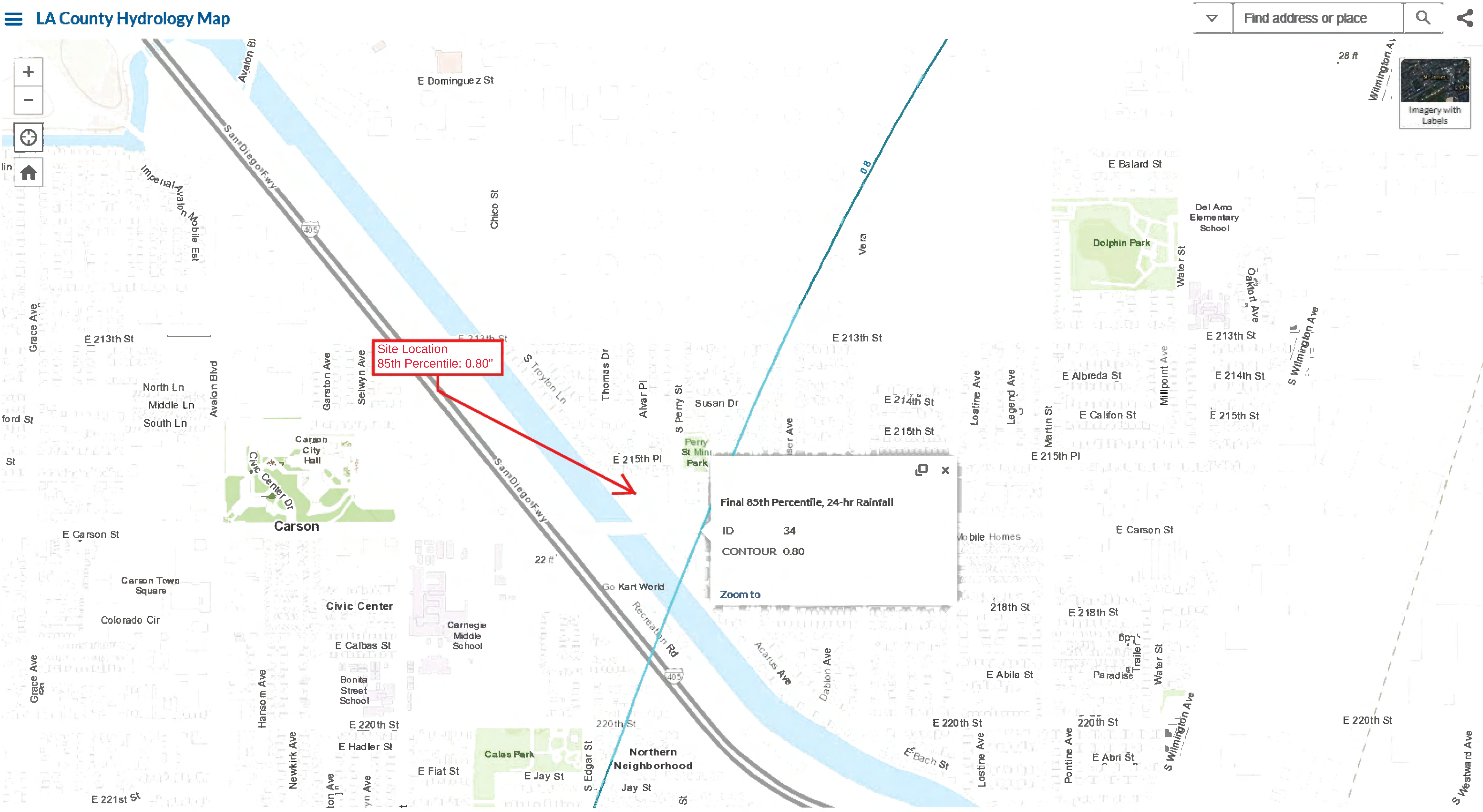
2.2.7. STRUCTURAL SOURCE CONTROL BMPS

NAME	CHECK ONE	
	Included	**Not Applicable**
Provide storm drain system stenciling and signage	☒	☐
Design and construct outdoor material storage areas to reduce pollution introduction	☐	☒
Design and construct trash and waste storage areas to reduce pollution introduction	☒	☐
Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐
Protect slopes and channels and provide energy dissipation	☐	☒
Loading docks	☐	☒
Maintenance bays	☐	☒
Vehicle wash areas	☐	☒
Outdoor processing areas	☐	☒
Equipment wash areas/racks	☐	☒
Fueling areas	☐	☒
Hillside landscaping	☐	☒

Attachment A

Calculations


Site Location
1 Yr, 1 Hr Intensity: 0.31"
1-year, 1-hour Rainfall Intensity
ID 244
CONTOUR 0.32
CONT_ID 0.32
Zoom to
Carson
Carson City Hall
Carson Town Square
Carnegie Middle School
Calas Park
Dominguez Channel
San Diego Fwy
Harbor Fwy
Long Beach Fwy
Los Angeles River
W 190th St
W Griffith St
Victoria Park
E University Dr
Goodyear Blimp Base
Victoria Golf Course
E Elsmere Dr
E Turmont St
Dominguez Technology Center
E Gladwick St
E Helmick St
Curtiss Middle School
Del Amo Park
Dominguez Golf Course
Knox St
Francisco St
Lenardo Dr
South Bay Pavilion
E Cyrene Dr
E Del Amo Blvd
Carson Town Center
The Boulevards At South Bay
Torrance Blvd
Dolphin Park
E Dominguez St
E Harrison St
E Jackson Ave
E Madison Ave
E Adams Ave
W 214th St
E 213th St
E Carson St
W Carson St
La County Harbor-UCLA Medical Center
W 220th St
E 220th St
White Middle School
W 223rd St
E 223rd St
W 225th St
W 227th St
W 228th St
Carson High School
E 228th St
E 229th Pl
E Watson Center Rd
E 230th St
W 231st St
W 234th St
E 233rd St
Scott Park
E 236th St
W Sepulveda Blvd
E Sepulveda Blvd
Carson Depot
E Pacific St
Sepulveda Blvd
240th St
Perry Lindsey Academy
Virginia Country Club
Scherer
E 45th St
E 53rd St
E 55th St
E 56th St
E 57th St
E Norton St
E Ellis St
W Wardlow Rd
W Spring St
W Canton St
William Logan Stephens Middle School
Silverado
W 27th St


LA County Hydrology Map
Find address or place
Imagery with Labels
Site Location
85th Percentile: 0.80"
Final 85th Percentile, 24-hr Rainfall
ID 34
CONTOUR 0.80
Zoom to
0.8
E Dominguez St
San Diego Fwy
E 213th St
E 215th Pl
E 215th St
E Carson St
Carson
Civic Center
Carson City Hall
Carson Town Square
Carnegie Middle School
Bonita Street School
Calas Park
Dolphin Park
Del Amo Elementary School
Perry St Mini Park
Go Kart World
Northern Neighborhood
E 220th St
E Balard St
Susan Dr
Recreation Rd

$C_D = (0.9 * IMP) + (1.0 - IMP) * C_U$

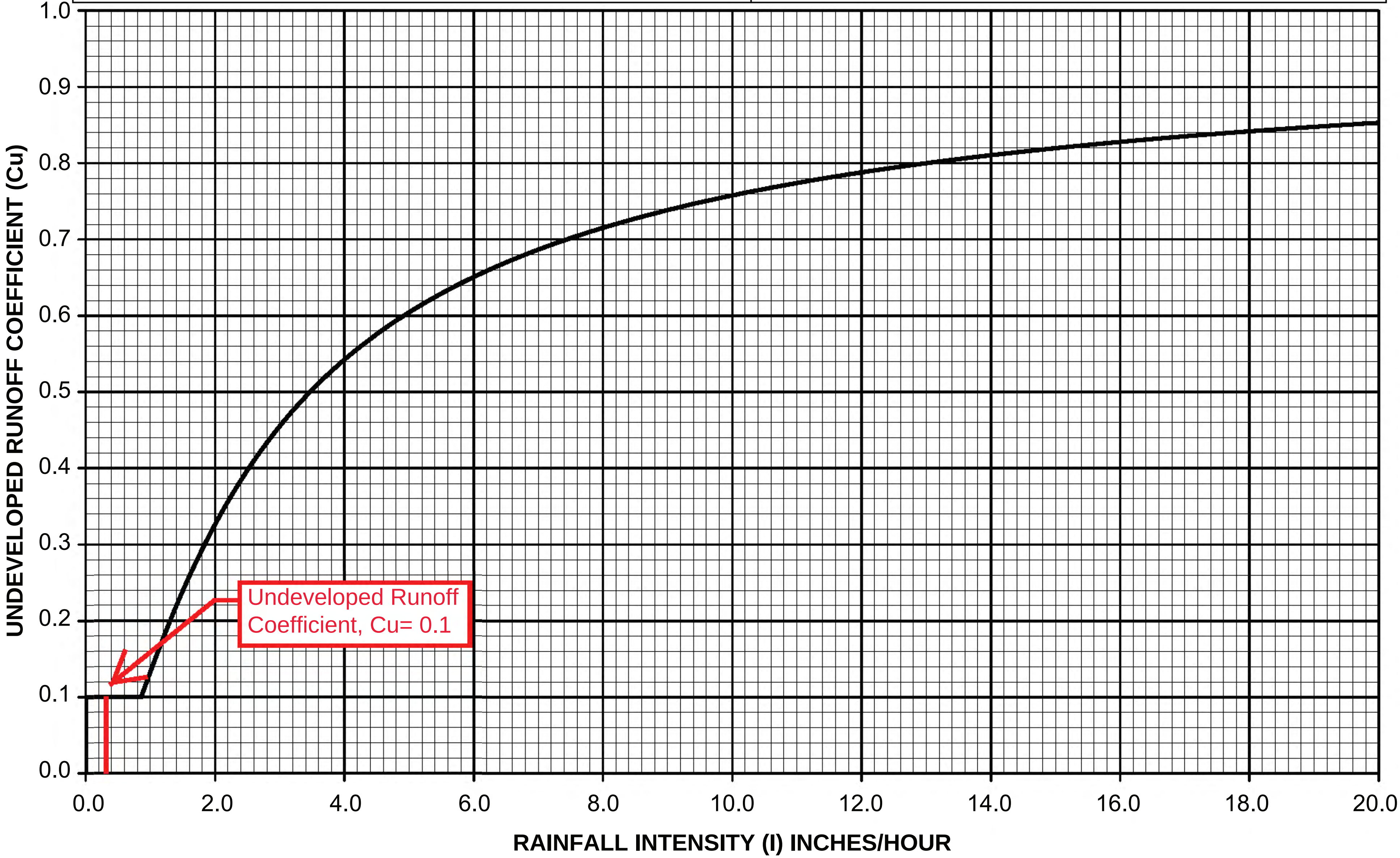
Where: C_D = Developed Runoff Coefficient

IMP = Proportion Impervious

C_U = Undeveloped runoff coefficient

Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE
SOIL TYPE NO. 003

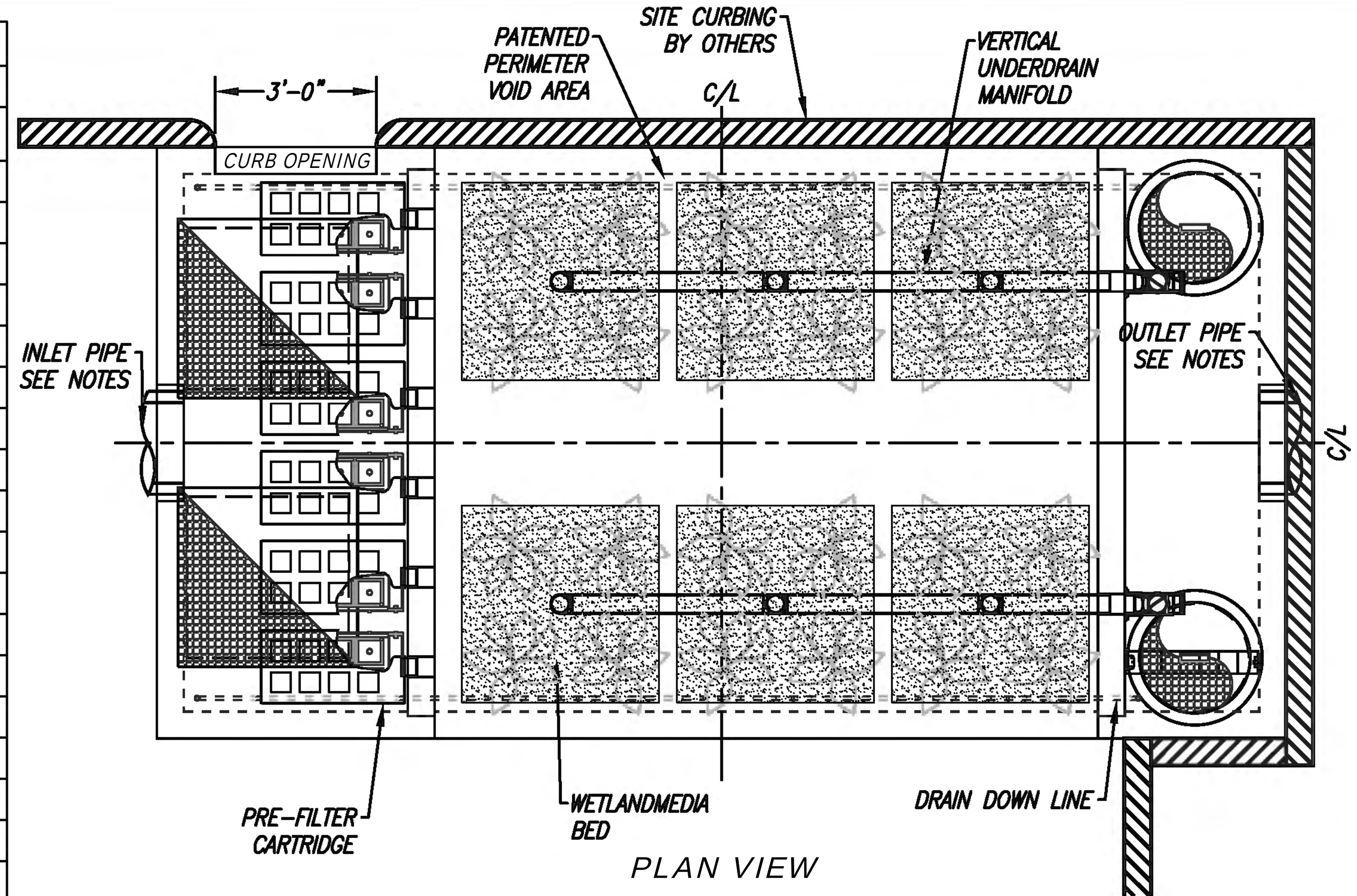


Flow Based BMP's								
BMP-#	BMP type	BMP size	Tributary Area (ac)	Intensity (in/hr)	Runoff Coefficient (c)	Req'd flowrate/Discharge rate (cfs) Q=C*I*A	BMP Flowrate (cfs)	Notes
BMP-1	Modular wetland	10'x20'	2.77	0.31	0.818	0.702	0.710	BMP flowrate given by mfr

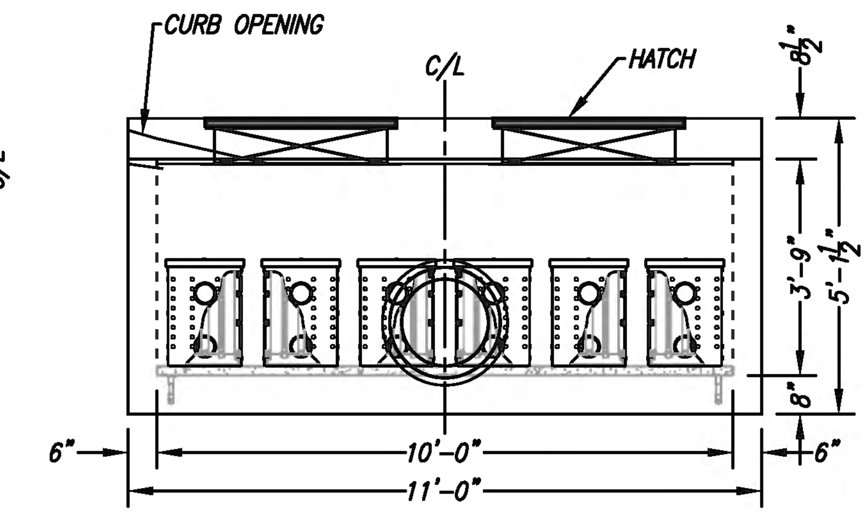
[redacted]				
DMA-1	120,644	2.77	89.8%	0.818

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.710	
TREATMENT HGL AVAILABLE (FT)			N/K
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			FLOW BY
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESIRIAN	OPEN PLANIER	PEDESTRIAN
FRAME & COVER	2 EA 36" X 36"	N/A	2 EA ø24"
WETLANDMEDIA VOLUME (CY)			
ORIFICE SIZE (DIA. INCHES)			2 EA ø2.67"

NOTES: PRELIMINARY. 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 MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS 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 TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. 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 GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
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6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING MODULAR WETLANDS FOR ACTIVATION OF UNIT. MANUFACTURES WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A MODULAR WETLANDS REPRESENTATIVE.

GENERAL NOTES

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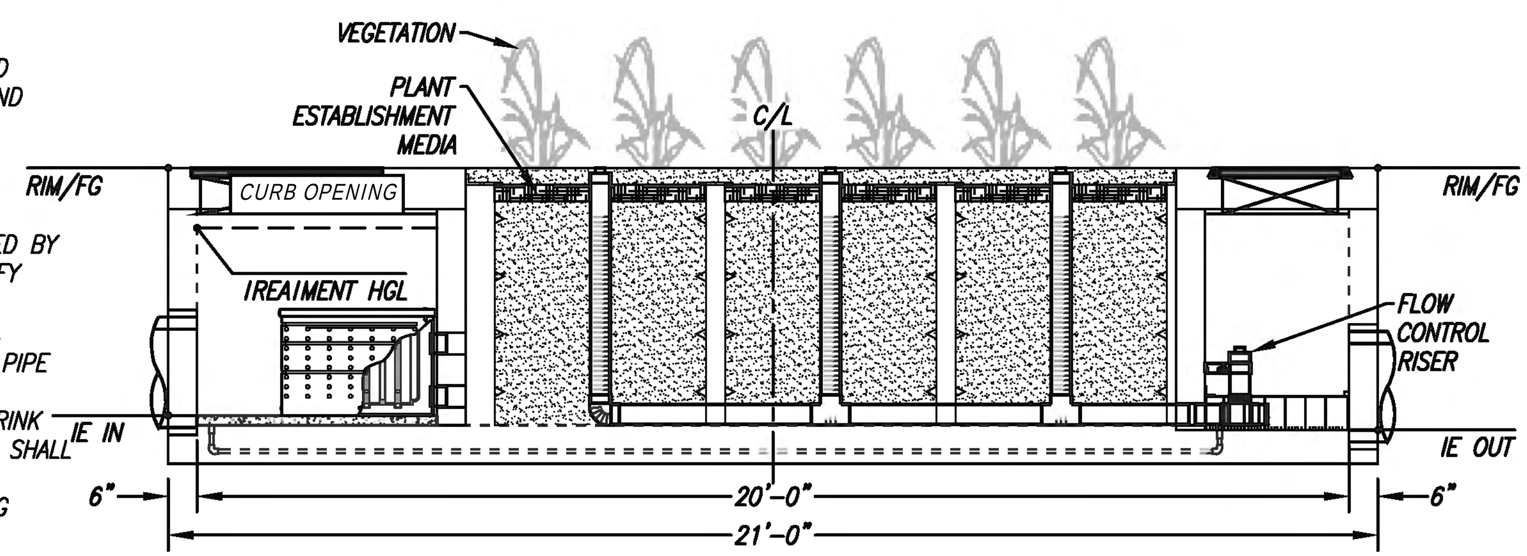
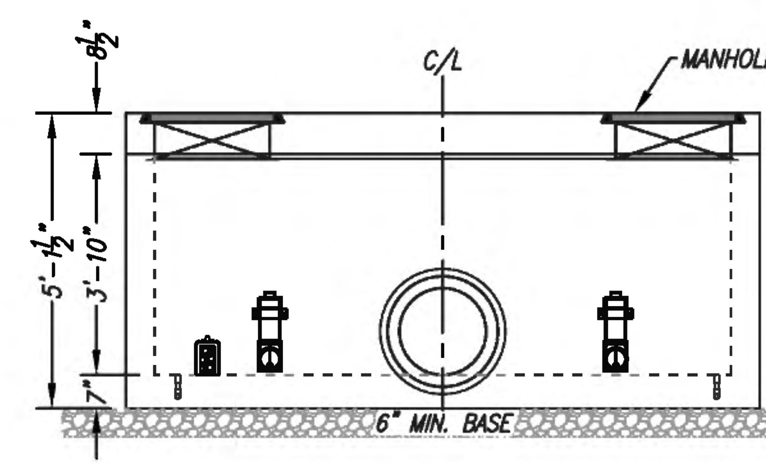
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.



ELEVATION VIEW



RIGHT END VIEW

LOW INFLOW PIPE DISCLOSURE:

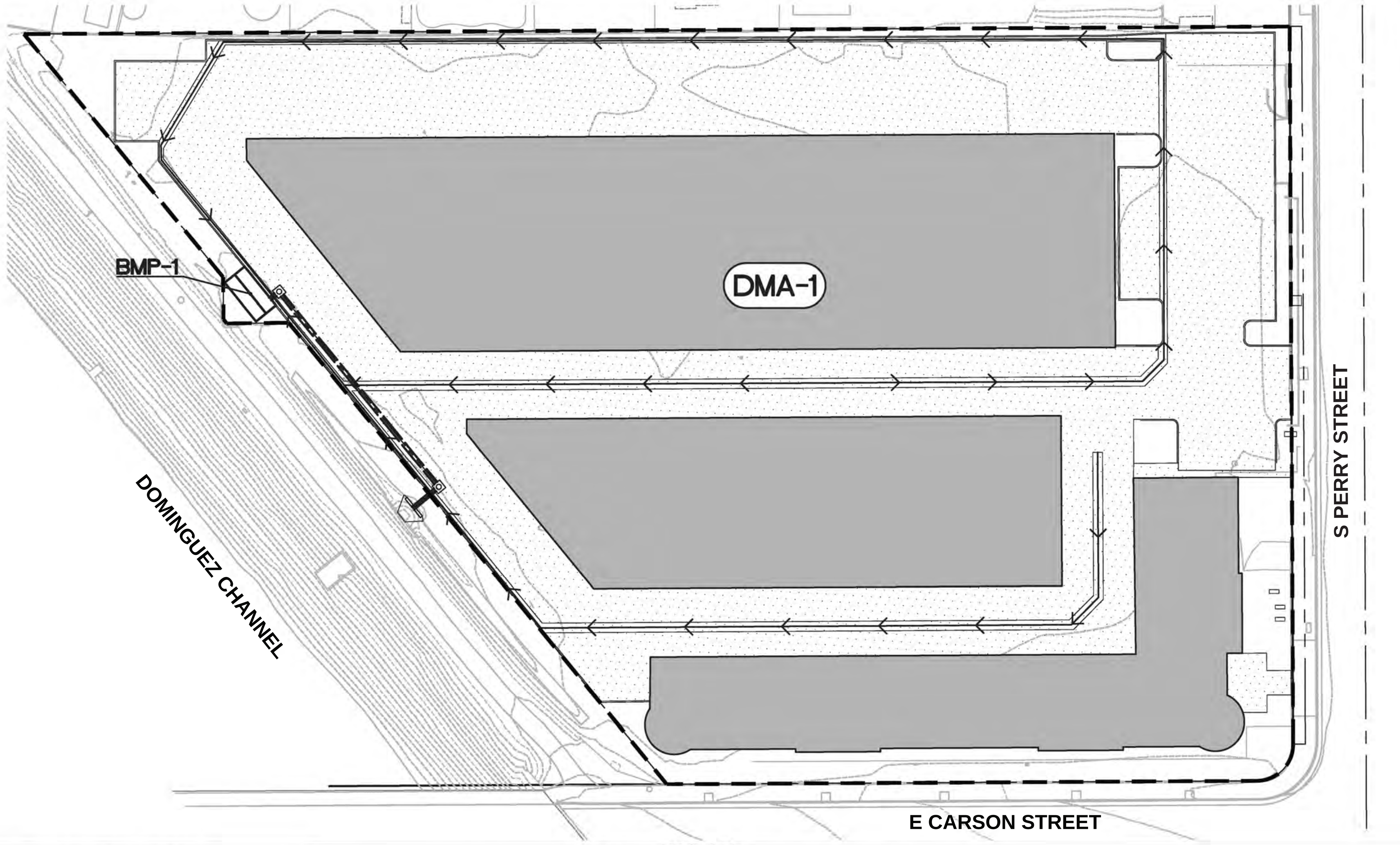
IT IS RECOMMENDED THAT A SUFFICIENT VARIATION IN ELEVATION BETWEEN THE INLET AND OUTLET BE PROVIDED TO ALLOW FOR ACCUMULATION OF SEDIMENT IN THE PRE-TREATMENT CHAMBER. FAILURE TO DO SO MAY RESULT IN BLOCKAGE AT INFLOW POINT(S) WHICH MAY CAUSE UPSTREAM FLOODING.

TREATMENT FLOW (CFS)	0.710
OPERATING HEAD (FT)	3.5
PRETREATMENT LOADING RATE (GPM/SF)	2.1
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS

Bio Clean
A Forterra Company

MWS-L-10-20-4'-5.5"-C-HC
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL



LEGEND

AREA LIMITS	
FLOW ARROWS	
BUILDING AREA	
PAVEMENT AREA	
DRAINAGE MGMT AREA (DMA) NUMBER	DMA-1

DMA DATA TABLE

DMA-NO.	TOT. AREA (SF)	IMPERVIOUS (%)	REQ'D FLOWRATE (CFS)	BMP FLOWRATE (CFS)	TYPE/TREATED BY
DMA-1	120,644	89.8	0.702	0.710	BMP-1/MODULAR WETLAND

PLAN PREPARED BY:

OMEGA ENGINEERING CONSULTANTS
4340 VIEWRIDGE AVE. SUITE B
SAN DIEGO, CA 92123
PH:(858) 634-8620 FAX:(858)-634-8627

GENERAL STORM WATER NOTES

1. GROUNDWATER IS ANTICIPATED AT APPROXIMATELY 12.5 FEET BELOW EXISTING GRADE ON SITE.
2. NO EXISTING NATURAL HYDROLOGIC FEATURES
3. NO SIGNIFICANT ECOLOGICAL AREAS ON SITE
4. ALL APPLICABLE SOURCE CONTROL BMPS SHALL BE IMPLEMENTED
   5A. SOURCE CONTROL NOTES TO COME IN MINISTERIAL REVIEW

Peak Flow Hydrologic Analysis

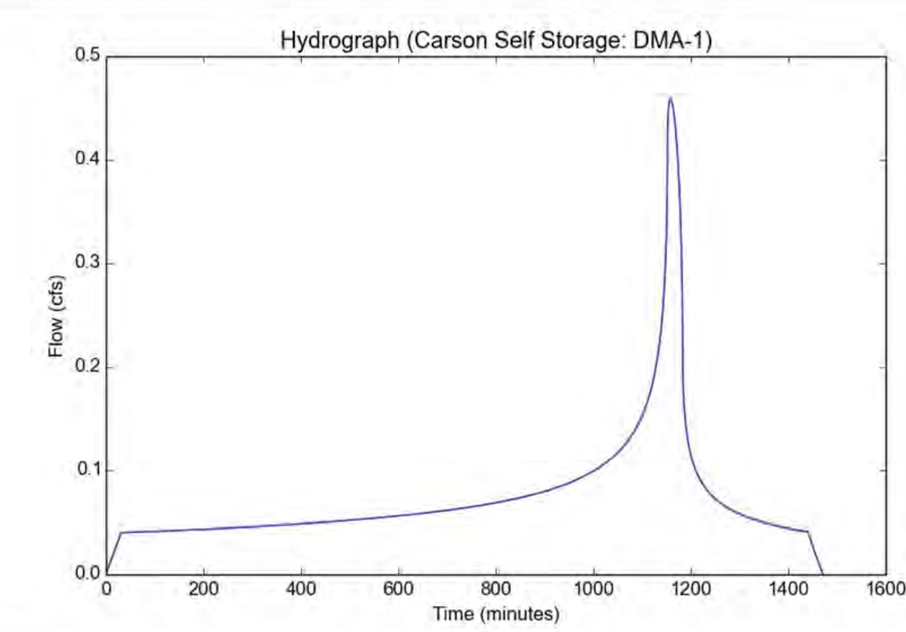
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/Water Quality/ATTACHMENTS/85th Percentile Hydro(
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self Storage
Subarea ID	DMA-1
Area (ac)	2.77
Flow Path Length (ft)	475.0
Flow Path Slope (vft/hft)	0.006
85th Percentile Rainfall Depth (in)	0.8
Percent Impervious	0.898
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.8
Peak Intensity (in/hr)	0.2025
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8184
Time of Concentration (min)	31.0
Clear Peak Flow Rate (cfs)	0.459
Burned Peak Flow Rate (cfs)	0.459
24-Hr Clear Runoff Volume (ac-ft)	0.1499
24-Hr Clear Runoff Volume (cu-ft)	6528.9479



PROJECT HYDROGRAPH

GRAPHICAL SCALE: 1" = 40'
0 20 40 80 120

SITE SPECIFIC DATA

PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.710	
TREATMENT HGL AVAILABLE (FT)			N/K
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			FLOW BY
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
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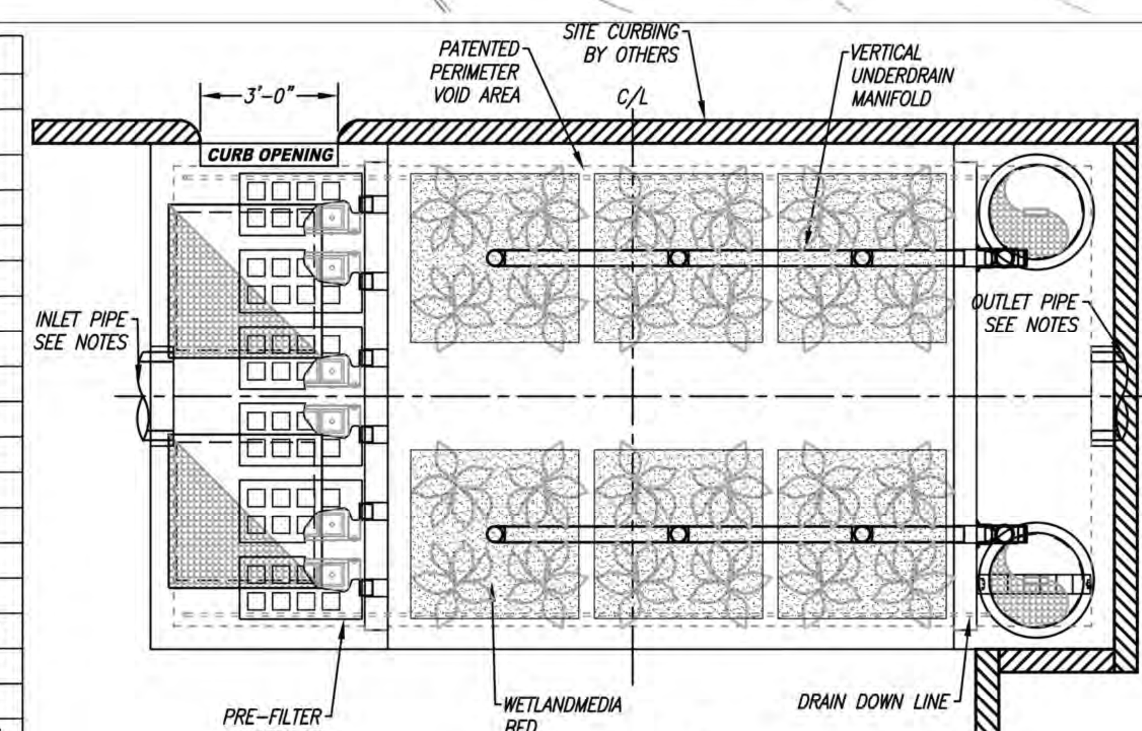
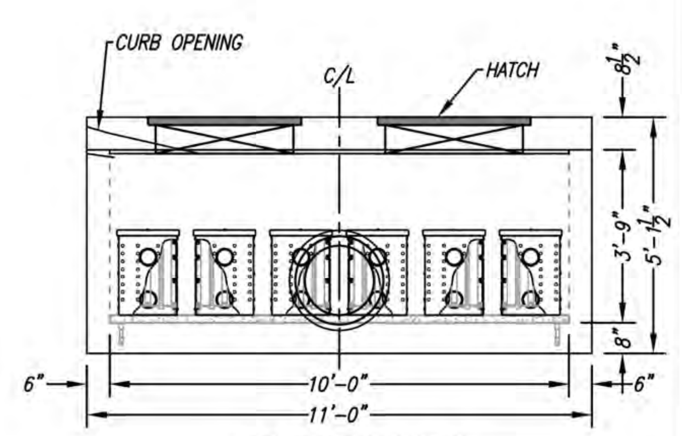


PLAN VIEW



LEFT END VIEW

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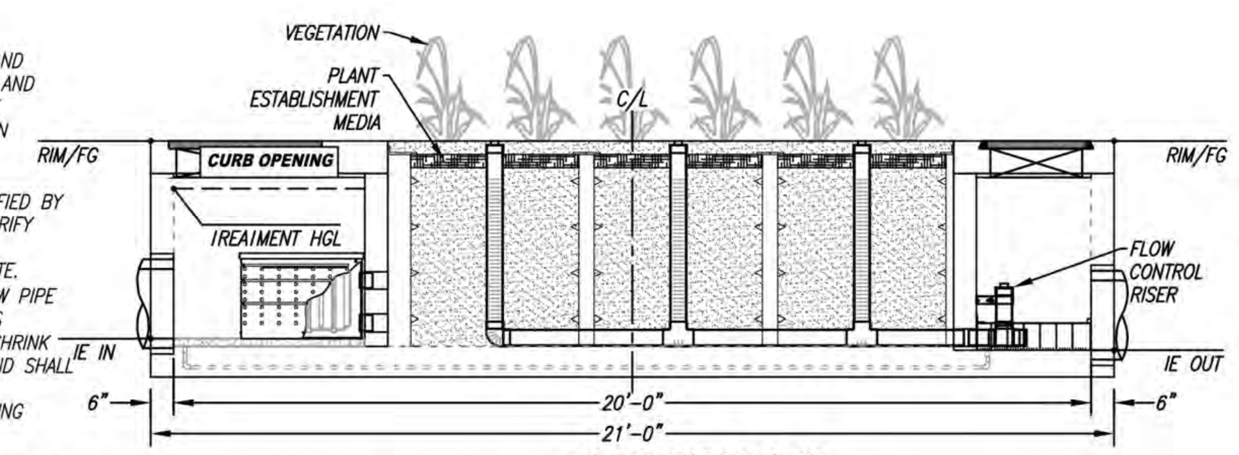
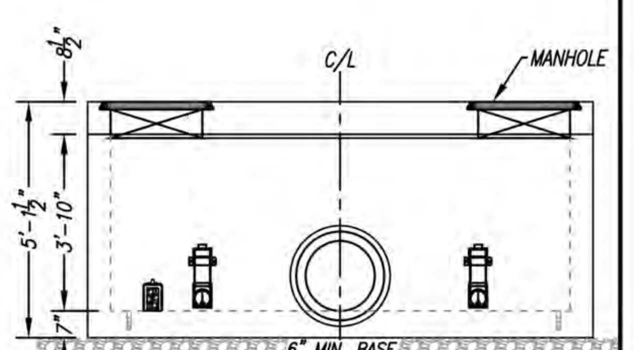


ELEVATION VIEW



RIGHT END VIEW

LOW INFLOW PIPE DISCLOSURE:

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TREATMENT FLOW (CFS)	0.710
OPERATING HEAD (FT)	3.5
PRETREATMENT LOADING RATE (GPM/SF)	2.1
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MODULAR WETLANDS SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MODULAR WETLANDS SYSTEMS IS PROHIBITED.

Bio Clean
A Forterra Company

MWS-L-10-20-4'-5.5"-C-HC
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

MODULAR WETLAND DETAIL

NOT TO SCALE

PERRY STREET
CARSON STREET SS
CARSON, CA

REGISTERED PROFESSIONAL ENGINEER SEAN M. SAVAGE No.75677 CIVIL STATE OF CALIFORNIA

FOR PLAN CHECK ONLY

SEAN M. SAVAGE R.C.E. 75677 DATE

JOB NUMBER: 20-817

DATE: 10/05/2021

JORDAN ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090

DATE: 5/14/2021 11:41:32 AM

FILENAME: P:\DWG OMEGA\0633 FARING SS CARSON\ACAD\DISCRETIONARY\0633-C2P-03-DMA.DWG

Attachment B

Geotechnical Investigation

GEOTECHNICAL INVESTIGATION

PROPOSED COMMERCIAL DEVELOPMENT
21611 SOUTH PERRY STREET
CARSON, CALIFORNIA
APN: 7327-010-014

GEOCON
WEST, INC.

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR
FARING CAPITAL, LLC
WEST HOLLYWOOD, CALIFORNIA

PROJECT NO. W1301-06-01

APRIL 23, 2021

Project No. W1301-06-01
April 23, 2021

Faring Capital, LLC
659 North Robertson Boulevard,
West Hollywood, California 90069

Attention: Mr. Darren Embry

Subject: GEOTECHNICAL INVESTIGATION
PROPOSED COMMERCIAL DEVELOPMENT
21611 SOUTH PERRY STREET
CARSON, CALIFORNIA
APN: 7327-010-014

Dear Mr. Embry:

In accordance with your authorization of our proposal dated December 11, 2020, we have prepared this geotechnical investigation report for the proposed commercial development located at 21611 South Perry Street in the City of Carson, California. The accompanying report presents the findings of our study, and our conclusions and recommendations pertaining to the geotechnical aspects of proposed design and construction. Based on the results of our investigation, it is our opinion that the site can be developed as proposed, provided the recommendations of this report are followed and implemented during design and construction.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned.

Very truly yours,

GEOCON WEST, INC.

REGISTERED PROFESSIONAL ENGINEER
JELISA THOMAS ADAMS
GE3092
GEOTECHNICAL
STATE OF CALIFORNIA

PROFESSIONAL GEOLOGIST
SUSAN FRANZEN KIRKGARD
No. 1754
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Joe Hicks	Jelisa Thomas Adams	Susan F. Kirkgard
Staff Engineer	GE 3092	CEG 1754

(EMAIL) Addressee

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report presents the results of a geotechnical investigation for the proposed commercial development located at 21611 South Perry Street in the City of Carson, California (see Vicinity Map, Figure 1). The purpose of the investigation was to evaluate subsurface soil and geologic conditions underlying the site and, based on conditions encountered, to provide conclusions and recommendations pertaining to the geotechnical aspects of design and construction.

The scope of this investigation included a review of prior environmental reports for the site provided by the client, a site reconnaissance, field exploration, laboratory testing, engineering analysis, and the preparation of this report. The site was explored on February 9, 2021 by drilling five 8-inch diameter borings using a truck-mounted hollow-stem auger drilling machine and advancing five cone penetrometer tests (CPTs). The borings were excavated to depths between approximately 20½ and 51 feet beneath the existing ground surface. The CPTs were advanced to depths of approximately 60 feet below existing ground surface. The approximate locations of the exploratory borings and CPTs are depicted on the Site Plan (see Figure 2). A detailed discussion of the field investigation, including the boring and CPT logs, is presented in Appendix A.

Laboratory tests were performed on selected soil samples obtained during the investigation to determine pertinent physical and chemical soil properties. Appendix B presents a summary of the laboratory test results.

The recommendations presented herein are based on analysis of the data obtained during the investigation and our experience with similar soil and geologic conditions. References reviewed to prepare this report are provided in the *List of References* section.

If project details vary significantly from those described herein, Geocon should be contacted to determine the necessity for review and possible revision of this report.

2. SITE AND PROJECT DESCRIPTION

The subject site is an approximately 2.6-acre irregularly shaped parcel located at 21611 South Perry Street in the City of Carson, California. The site is currently vacant. The site is bounded by South Perry Street on the east, by the Dominguez Channel to the west, by one- to two-story single-family homes to the north, and by East Carson Street to the south. The site is relatively level, with no pronounced highs or lows. Surface water drainage at the site appears to be by sheet flow along the existing ground contours to the city streets.

Based on the information provided by the Client, it is our understanding that the proposed development will consist of three 2-story self-storage structures. Based on preliminary plans it is anticipated that the development will be approximately 25 feet in height and will be constructed at or near present grade (see Figure 2).

Based on the preliminary nature of the design at this time, wall and column loads were not available. It is anticipated that column loads for the proposed structures will be up to 300 kips, and wall loads will be up to 3 kips per linear foot.

Once the design phase and foundation loading configuration proceeds to a more finalized plan, the recommendations within this report should be reviewed and revised, if necessary. Any changes in the design, location or elevation of any structure, as outlined in this report, should be reviewed by this office. Geocon should be contacted to determine the necessity for review and possible revision of this report.

3. BACKGROUND

Prior environmental reports were prepared for the site and provided for our review, and include the following:

Phase 1 Environmental Site Assessment, 21611 S. Perry Street, Carson, CA. 90745-1613, Prepared by Weis Environmental, dated January 25, 2021.

2020 First Semi-Annual Groundwater Monitoring Report, January Through June 2020, Dominguez Channel Release, Carson, California, Prepared by AECOM, dated July 14, 2020.

Based on the prior reports, petroleum hydrocarbon impacted soil and groundwater were previously identified at the site that originated from on-site underground storage tanks (USTs) and migration of contaminants from off-site sources. AECOM (formerly URS) developed a workplan that developed cleanup goals and excavation limits to remove impacted soils that was approved by the LARWQCB. In 2014, approximately 4,800 cubic yards of impacted soils were excavated from four areas and removed from the site. The excavations were approximately 5 to 8 feet deep and were backfilled with clean import soils (Weis Environmental, 2021). The approximate locations and depths of these areas are indicated on the Site Plan (see Figure 2). The backfill was reportedly placed, compacted, and tested as a certified backfill material; however, a copy of the compaction report was not included as an exhibit. Therefore, for the purposes of this report, the backfill is considered to be uncertified fill.

Also, as part of the prior site remediation, groundwater monitoring wells were installed at the site and the immediately surrounding area. The monitoring wells present at the site are limited to the eastern, western, and southern property boundaries. Groundwater monitoring is ongoing in these wells in compliance with a semi-annual groundwater monitoring program required by the LARWQCB.

Based on documents included in the referenced environmental reports, the known soil and groundwater impacts are within acceptable levels for commercial use and further assessment or remediation is not required. However, a soil management plan (SMP) is anticipated required for further development of the site. Development of a soil management plan is beyond the scope of the Geotechnical Investigation.

4. GEOLOGIC SETTING

The site is located in the southern portion of the Los Angeles Basin, a coastal plain bounded by the Santa Monica Mountains on the north, the Elysian Hills and Repetto Hills on the northeast, the Puente Hills and the Whittier Fault on the east, the Palos Verdes Peninsula and Pacific Ocean on the west and south, and the Santa Ana Mountains and San Joaquin Hills on the southeast. The basin is underlain by a deep structural depression which has been filled by both marine and continental sedimentary deposits underlain by a basement complex of igneous and metamorphic composition. Regionally, the site is located within the northern portion of the Peninsular Ranges geomorphic province. This geomorphic province is characterized by northwest-trending physiographic and geologic features such as the nearby Newport-Inglewood Fault Zone located approximately 2.7 miles to the east-northeast.

5. SOIL AND GEOLOGIC CONDITIONS

Based on our field investigation and published geologic maps of the area, the site is underlain by artificial fill and Holocene age alluvium consisting sand, silt, and clay (California Geological Survey, 2010). Detailed stratigraphic profiles of the materials encountered at the site are provided on the boring logs in Appendix A.

5.1 Artificial Fill

Artificial fill was encountered in our explorations to depths ranging from 3 to 9 feet below existing ground surface. The deep fill, observed in boring B3, is associated with an area of a former UST removal. The artificial generally consists of light brown to brown or grayish brown sand and silty sand. The artificial fill is characterized as fine-grained with some medium-grained, moist, and loose to dense. The fill is likely the result of past grading, UST removal and environmental remediation, and past construction activities at the site. Deeper fill may exist between excavations and in other portions of the site that were not directly explored.

5.2 Alluvium

Holocene age alluvium was encountered beneath the fill to the maximum depth explored (51 feet below the ground surface). The alluvium generally consists of light brown to brown, olive brown, or gray to dark gray interbedded clay, sandy clay, silt, sandy silt, silty sand and clayey sand. The alluvial soils are characterized as primarily fine-grained, moist to wet, and loose to dense or soft to stiff.

6. GROUNDWATER

A review of the Seismic Hazard Zone Report for the Torrance Quadrangle (California Division of Mines and Geology [CDMG], 1998) indicates the historically highest groundwater level in the area is approximately 9 feet beneath the ground surface. Groundwater information presented in this document is generated from data collected in the early 1900's to the late 1990s. Based on current groundwater basin management practices, it is unlikely that groundwater levels will ever exceed the historic high levels.

Groundwater was encountered in borings B1 and B3 at depths of 12.5 feet and 17.6 feet beneath the existing ground surface, respectively. Additionally, readings from groundwater monitoring wells established on the site were taken on February 23, 2021. The locations of the accessible monitoring wells are indicated on the site plan (see Figure 2) and a summary of groundwater levels at the time of the investigation is provided in the table below.

Monitoring Well Readings

Well ID	MW-3	MW-4	MW-5	MW-7A	MW-8A	MW-9B
Depth to GW (Below Ground Surface)	12.0'	13.17'	12.25'	12.33'	12.67'	14.67'

Based on the depth to groundwater and the on-grade nature of the development, groundwater is not expected to have a detrimental effect on the project. Groundwater may be encountered during construction in deep drilled excavations, such as for ground improvement or elevator pistons. It is not uncommon for groundwater levels to vary seasonally or for groundwater seepage conditions to develop where none previously existed, especially in impermeable fine-grained soils which are heavily irrigated or after seasonal rainfall. In addition, recent requirements for stormwater infiltration could result in shallower seepage conditions in the immediate site vicinity. Proper surface drainage of irrigation and precipitation will be critical for future performance of the project. Recommendations for drainage are provided in the S*urface Drainage* section of this report (see Section 8.20).

7. GEOLOGIC HAZARDS

7.1 Surface Fault Rupture

The numerous faults in Southern California include Holocene-active, pre-Holocene, and inactive faults. The criteria for these major groups are based on criteria developed by the California Geological Survey (CGS, formerly known as CDMG) for the Alquist-Priolo Earthquake Fault Zone Program (CGS, 2018). By definition, a Holocene-active fault is one that has had surface displacement within Holocene time (about the last 11,700 years). A pre-Holocene fault has demonstrated surface displacement during Quaternary time (approximately the last 1.6 million years) but has had no known Holocene movement. Faults that have not moved in the last 1.6 million years are considered inactive.

The site is not within a state-designated Alquist-Priolo Earthquake Fault Zone for surface fault rupture hazards (CGS, 2021a; CGS, 2021b; CDMG 1986). No Holocene-active or pre-Holocene active faults with the potential for surface fault rupture are known to pass directly beneath the site. Therefore, the potential for surface rupture due to faulting occurring beneath the site during the design life of the proposed development is considered low. However, the site is located in the seismically active Southern California region, and could be subjected to moderate to strong ground shaking in the event of an earthquake on one of the many active Southern California faults. The faults in the vicinity of the site are shown in Figure 3, Regional Fault Map.

The closest surface trace of an active fault to the site is the Newport-Inglewood Fault Zone located approximately 2.7 miles to the east-northeast (USGS, 2006; CDMG, 1986). Other nearby active faults are the Palos Verdes Fault, the Cabrillo Fault, and the Whittier Fault located approximately 4.2 miles south-southwest, 8.2 miles south, and 16 miles northeast of the site, respectively. The active San Andreas Fault Zone is located approximately 48 miles northeast of the site.

Several buried thrust faults, commonly referred to as blind thrusts, underlie the Los Angeles Basin at depth. These faults are not exposed at the ground surface and are typically identified at depths greater than 3.0 kilometers. The October 1, 1987, M_w 5.9 Whittier Narrows earthquake and the January 17, 1994, M_w 6.7 Northridge earthquake were a result of movement on the Puente Hills Blind Thrust and the Northridge Thrust, respectively. These thrust faults and others in the Los Angeles area are not exposed at the surface and do not present a potential surface fault rupture hazard at the site; however, these deep thrust faults are considered active features capable of generating future earthquakes that could result in moderate to significant ground shaking at the site.

7.2 Seismicity

As with all of Southern California, the site has experienced historic earthquakes from various regional faults. The seismicity of the region surrounding the site was formulated based on research of an electronic database of earthquake data. The epicenters of recorded earthquakes with magnitudes equal to or greater than 5.0 in the site vicinity are depicted on Figure 4, Regional Seismicity Map. A partial list of moderate to major magnitude earthquakes that have occurred in the Southern California area within the last 100 years is included in the following table.

LIST OF HISTORIC EARTHQUAKES

Earthquake (Oldest to Youngest)	Date of Earthquake	Magnitude	Distance to Epicenter (Miles)	Direction to Epicenter
Near Redlands	July 23, 1923	6.3	59	E
Long Beach	March 10, 1933	6.4	22	SE
Tehachapi	July 21, 1952	7.5	91	NW
San Fernando	February 9, 1971	6.6	41	NNW
Whittier Narrows	October 1, 1987	5.9	19	NE
Sierra Madre	June 28, 1991	5.8	33	NE
Landers	June 28, 1992	7.3	107	ENE
Big Bear	June 28, 1992	6.4	85	ENE
Northridge	January 17, 1994	6.7	31	NW
Hector Mine	October 16, 1999	7.1	125	ENE
Ridgecrest	July 5, 2019	7.1	138	NNE

The site could be subjected to strong ground shaking in the event of an earthquake. However, this hazard is common in Southern California and the effects of ground shaking can be mitigated if the proposed structures are designed and constructed in conformance with current building codes and engineering practices.

7.3 Seismic Design Criteria

The following table summarizes the site-specific design criteria obtained from the 2019 California Building Code (CBC; Based on the 2018 International Building Code [IBC] and NEHRP-2015), Chapter 16 Structural Design, Section 1613, Earthquake Loads. The data was calculated using the online application *Seismic Design Maps*, provided by OSHPD. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613.2.2 of the 2019 CBC and Section 11.4.3 of NEHRP-2015. The values presented on the following page are for the risk-targeted maximum considered earthquake (MCE_R).

2019 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2019 CBC Reference
Site Class	D	Section 1613.2.2
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	1.711g	Figure 1613.2.1(1)
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.618g	Figure 1613.2.1(2)
Site Coefficient, F_A	1	Table 1613.2.3(1)
Site Coefficient, F_V	1.7*	Table 1613.2.3(2)
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	1.711g	Section 1613.2.3 (Eqn 16-36)
Site Class Modified MCE_R Spectral Response Acceleration – (1 sec), S_{M1}	1.05g*	Section 1613.2.3 (Eqn 16-37)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	1.141g	Section 1613.2.4 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.7g*	Section 1613.2.4 (Eqn 16-39)

Note:
*Per Section 11.4.8 of ASCE/SEI 7-16, a ground motion hazard analysis shall be performed for projects for Site Class “E” sites with Ss greater than or equal to 1.0g and for Site Class “D” and “E” sites with S1 greater than 0.2g. Section 11.4.8 also provides exceptions which indicates that the ground motion hazard analysis may be waived provided the exceptions are followed. Using the code based values presented in the table above, in lieu of a performing a ground motion hazard analysis, requires the exceptions outlined in ASCE 7-16 Section 11.4.8 be followed.

The table below presents the mapped maximum considered geometric mean (MCE_G) seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with NEHRP-2015.

ASCE 7-16 PEAK GROUND ACCELERATION

Parameter	Value	ASCE 7-16 Reference
Mapped MCE_G Peak Ground Acceleration, PGA	0.748g	Figure 22-7
Site Coefficient, F_{PGA}	1.1	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	0.823g	Section 11.8.3 (Eqn 11.8-1)

The Maximum Considered Earthquake Ground Motion (MCE) is the level of ground motion that has a 2 percent chance of exceedance in 50 years, with a statistical return period of 2,475 years. According to the 2019 California Building Code and ASCE 7-16, the MCE is to be utilized for the evaluation of liquefaction, lateral spreading, seismic settlements, and it is our understanding that the intent of the Building code is to maintain "Life Safety" during a MCE event. The Design Earthquake Ground Motion (DE) is the level of ground motion that has a 10 percent chance of exceedance in 50 years, with a statistical return period of 475 years.

Deaggregation of the MCE peak ground acceleration was performed using the USGS online Unified Hazard Tool, 2014 Conterminous U.S. Dynamic edition (v4.2.0). The result of the deaggregation analysis indicates that the predominant earthquake contributing to the MCE peak ground acceleration is characterized as a 6.87 magnitude event occurring at a hypocentral distance of 8.35 kilometers from the site.

Deaggregation was also performed for the Design Earthquake (DE) peak ground acceleration, and the result of the analysis indicates that the predominant earthquake contributing to the DE peak ground acceleration is characterized as a 6.68 magnitude occurring at a hypocentral distance of 13.48 kilometers from the site.

Conformance to the criteria in the above tables for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large earthquake occurs. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

7.4 Liquefaction Potential

Liquefaction is a phenomenon in which loose, saturated, relatively cohesionless soil deposits lose shear strength during strong ground motions. Primary factors controlling liquefaction include intensity and duration of ground motion, gradation characteristics of the subsurface soils, in-situ stress conditions, and the depth to groundwater. Liquefaction is typified by a loss of shear strength in the liquefied layers due to rapid increases in pore water pressure generated by earthquake accelerations.

The current standard of practice, as outlined in the "Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California" and "Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California" requires liquefaction analysis to a depth of 50 feet below the lowest portion of the proposed structure. Liquefaction typically occurs in areas where the soils below the water table are composed of poorly consolidated, fine to medium-grained, primarily sandy soil. In addition to the requisite soil conditions, the ground acceleration and duration of the earthquake must also be of a sufficient level to induce liquefaction.

A review of the State of California Seismic Hazard Zone Map for the Torrance Quadrangle (CDMG, 1999) indicates that the site is located in an area designated as having a potential for liquefaction. Also, the City of Carson (2002) indicates the site is located within an area that has a potential for liquefaction.

The Standard Penetration Test (SPT) blow counts obtained from boring B3 were compared with the blow counts estimated from the CPT soundings. SPTs were performed in boring B3 at intervals of approximately 5 feet. In order to supplement the SPT blow count data, select California Modified Sampler blow count data were converted to equivalent SPT blow counts based on a correlation factor of 0.55 (Rogers, 2006). The field collected blow counts were corrected for hammer efficiency to N60 blow count values. The boring N60 values were compared with the N60 values generated by the program CpetIT (Version 3.2.1.7). The comparison of CPT-3 and boring B3 are shown as Figure 5. It is our opinion that the boring and CPT N60 values show a very reasonable correlation and that analysis of the liquefaction potential may be based on the CPT data.

Liquefaction analyses of the CPT soundings were performed using the program CLiq (Version 3.0.3.2). This program utilizes the 2001 NCEER method of analysis. This semi-empirical method is based on correlations with the data collected from the CPT soundings.

The liquefaction analysis was performed for a Design Earthquake level by using a historic groundwater level of 9 feet below the ground surface, a magnitude 6.68 earthquake, and a peak horizontal acceleration of 0.549g (⅔PGAM). The results of the enclosed liquefaction analyses included herein for CPTs 1 through 5 indicate that the alluvial soils below the design groundwater level could be susceptible to the liquefaction induced settlements summarized in the table below during Design Earthquake ground motion. A summary of the anticipated liquefaction induced settlements is provided as Figure 6; calculations and output from CLiq are provided as Appendix C.

Liquefaction Induced Settlements (Design Earthquake)

CPT Number	**CPT-1**	**CPT-2**	**CPT-3**	**CPT-4**	**CPT-5**
Liquefaction Settlement (in)	0.43	0.11	0.20	0.00	0.28

It is our understanding that the intent of the Building Code is to maintain “Life Safety” during Maximum Considered Earthquake level events. Therefore, additional analysis was performed to evaluate the potential for liquefaction during a MCE event. The structural engineer should evaluate the proposed structure for the anticipated MCE liquefaction induced settlements and verify that anticipated deformations would not cause the foundation system to lose the ability to support the gravity loads and/or cause collapse of the structure.

The liquefaction analysis performed for the Maximum Considered Earthquake level by using a historic groundwater level of 9 feet below the ground surface, a magnitude 6.87 earthquake, and a peak horizontal acceleration of 0.823g (PGAM). The results of the enclosed liquefaction analyses included herein for CPTs 1 through 5 indicate that the alluvial soils below the design groundwater level could be susceptible to the liquefaction induced settlements summarized in the table below during Maximum Considered Earthquake ground motion. A summary of the anticipated liquefaction induced settlements is provided as Figure 7.

Liquefaction Induced Settlements (Maximum Considered Earthquake)

CPT Number	CPT-1	CPT-2	CPT-3	CPT-4	CPT-4
Liquefaction Settlement (in)	0.80	0.19	0.33	0.00	0.41

7.5 Seismically Induced Settlement

Dynamic compaction of dry and loose sands may occur during a major earthquake. Typically, settlements occur in thick beds of such soils. The seismically induced settlement calculations were performed in accordance with the American Society of Civil Engineers, Technical Engineering and Design Guides as adapted from the US Army Corps of Engineers, No. 9.

The calculations provided herein in Figures 8 and 9 indicate that the soil above the historic high groundwater level of 9 feet would not be susceptible to significant settlement as a result of the Design Earthquake peak ground acceleration (⅔PGA_M).

7.6 Lateral Spreading

Due to the presence of the Dominguez Channel located to the west of the site, the potential for lateral spread was evaluated. Lateral spread occurs as a result of liquefaction induced lateral ground movement and typically occurs due to the presence of a slope comprised of and/or underlain by liquefiable soils.

Analysis of the potential for lateral spread was performed using the program CLiq (Version 1.7). The program utilizes the method proposed by Zhang et. al. (2004) to evaluate the potential for lateral spread and the resulting lateral displacements.

This method of analysis recommends evaluating the potential for lateral displacements to a distance of 50H from the slope, where H is the height of the slope. Beyond a horizontal distance of 50H lateral displacements due to the presence of a slope are not anticipated to occur. This method of analysis considers soils to a depth of twice the total slope height as potentially subject to lateral spread, up to a distance of 50H away from the toe of the slope.

The drainage channel is trapezoidal in shape and consists of two slopes approximately 12 feet in height inclined at a gradient of approximately 2:1 (estimated via satellite images). The proposed improvements have a minimum setback of 90 feet from the toe of the drainage channel. Therefore, lateral displacements using a horizontal setback of 90 feet was utilized.

Based on the results of the analyses it is anticipated that up to 10 inches of lateral displacements towards the drainage channel could occur during a Design Earthquake ground motion. The lateral displacements are anticipated to occur between depths of 10 and 15 feet below the ground surface. Calculations and output from CLiq are provided as Appendix C.

The grading and foundation design recommendations presented in this report are intended to minimize the effects of lateral spread on the proposed improvements.

7.7 Slope Stability

The topography at the site is relatively level and the topography in the immediate site vicinity slopes gently to the west-southwest. The County of Los Angeles Safety Element (Leighton, 1990) indicates the site is not located within an area identified as a “hillside area” or having a potential for slope instability. Additionally, the site is not within an area identified as having a potential for seismic slope instability (CDMG, 1999). There are no known landslides near the site, nor is the site in the path of any known or potential landslides. Therefore, the potential for slope stability hazards to adversely affect the proposed development is considered low.

7.8 Earthquake-Induced Flooding

Earthquake-induced flooding is inundation caused by failure of dams or other water-retaining structures due to earthquakes. Based on a review of the County of Los Angeles Safety Element (Leighton, 1990), the site is not located within a potential inundation area for an earthquake-induced dam failure. Therefore, the probability of earthquake-induced flooding is considered very low.

7.9 Tsunamis, Seiches, and Flooding

The site is not located within a coastal area. Therefore, tsunamis are not considered a significant hazard at the site.

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. No major water-retaining structures are located immediately up gradient from the project site. Therefore, flooding resulting from a seismic-induced seiche is considered unlikely.

The site is within an area of minimal flooding (Zone X) as defined by the Federal Emergency Management Agency (FEMA, 2021; LACDPW, 2021).

7.10 Oil Fields & Methane Potential

Based on a review of the California Geologic Energy Management Division (CalGEM) Well Finder Website, the site is not located within an oil field and oil or gas wells are not documented in the immediate site vicinity (CalGEM, 2021). However, due to the voluntary nature of record reporting by the oil well drilling companies, wells may be improperly located or not shown on the location map and undocumented wells could be encountered during construction. Any wells encountered during construction will need to be properly abandoned in accordance with the current requirements of the CalGEM.

Since the site is not located within an oil field, the potential for methane or other volatile gases associated with oil and gas fields to be present at the site is considered low. However, as discussed in the Background section of this report (see Section 3), due to the site history there is a potential for low levels of volatile gases to be present, particularly during site grading. Should it be determined that a methane study or further environmental studies are required for the proposed development, it is recommended that a qualified methane or environmental consultant be retained to perform the study and provide mitigation measures as necessary.

7.11 Subsidence

Subsidence occurs when a large portion of land is displaced vertically, usually due to the withdrawal of groundwater, oil, or natural gas. Soils that are particularly subject to subsidence include those with high silt or clay content. The site is not located within an area of known ground subsidence. No large-scale extraction of groundwater, gas, oil, or geothermal energy is occurring or planned at the site or in the general site vicinity. There appears to be little or no potential for ground subsidence due to withdrawal of fluids or gases at the site.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 General

8.1.1 It is our opinion that neither soil nor geologic conditions were encountered during the investigation that would preclude construction of the proposed development provided the recommendations presented herein are followed and implemented during design and construction.

8.1.2 Up to 5 feet of existing artificial fill was encountered during the site investigation with localized areas of deeper fill of to 9 feet in depth. The existing fill encountered is believed to be the result of past grading and construction activities at the site. Deeper fill may exist in other areas of the site that were not directly explored. It is our opinion that the existing fill, in its present condition, is not suitable for direct support of proposed foundations or slabs. The existing fill and site soils are suitable for re-use as engineered fill provided the recommendations in the Grading section of this report are followed (see Section 8.4).

8.1.3 The enclosed liquefaction and seismically-induced settlement analyses indicate that the site soils could be susceptible to approximately ½ inch of total settlement as a result of the Design Earthquake peak ground acceleration (⅔PGA_M). Differential settlement at the foundation level is anticipated to be less than ¼ inch over a distance of 20 feet.

8.1.4 The results of the field data and laboratory testing indicate that the upper alluvial soils are relatively soft and compressible in their current condition (see Figure B5 thru B17) and could yield excessive static and differential settlements upon application of foundation loads.

8.1.5 The foundation design recommendations presented herein are intended to minimize the effects of settlement from liquefaction and consolidation on the proposed improvements. Based on our discussions with you, we understand that the preferred foundation system is a reinforced concrete mat foundation deriving support in newly placed engineered fill. Recommendations for a reinforced mat foundation system is provided in Sections 8.7 of this report.

8.1.6 For support of a mat foundation, it is recommended that the upper 6 feet of existing earth materials within the proposed building footprint areas be excavated and properly compacted for foundation and slab support. Deeper excavations should be conducted as necessary to remove deeper artificial fill or soft alluvial soil at the direction of the Geotechnical Engineer (a representative of Geocon). Proposed building foundations should be underlain by a minimum of 4 feet of newly placed engineered fill. The excavation should extend laterally a minimum distance of 3 feet beyond the building footprint area, including building appurtenances, or a distance equal to the depth of fill below the foundation, whichever is greater. The contractor should be aware that up to 9 feet of artificial fill was encountered in Boring B3. The limits of existing fill and/or soft alluvial soils removal will be verified by the Geocon representative during site grading activities. All excavations must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon).

8.1.7 It is anticipated that the recommended grading can be achieved with sloping measures. However, if excavations in close proximity to an adjacent property line and/or structure are required, special excavation measures in order to maintain lateral support of existing adjacent improvements will be required. Excavation recommendations are provided in the *Temporary Excavations* section of this report (Section 8.18).

8.1.8 Based on the relatively shallow groundwater table, the upper alluvial soils have the potential to be very moist and the grading contractor should be aware that the soils may be above optimum moisture content. If the soils are more than 3 percent above the optimum moisture content at the time of construction the soils will likely require some spreading and drying activities in order to achieve proper compaction. Bottom stabilization may also be necessary. Recommendations for bottom stabilization and earthwork are provided in the *Grading* section of this report (see Section 8.4).

8.1.9 Foundations for small outlying structures, such as block walls up to 6 feet in height, planter walls or trash enclosures, which will not be tied to the proposed structure, may be supported on conventional foundations deriving support on a minimum of 12 inches of newly placed engineered fill which extends laterally at least 12 inches beyond the foundation area. Where excavation and compaction cannot be performed or is undesirable, foundations may derive support directly in the competent undisturbed alluvial soils and should be deepened as necessary to maintain a minimum 12 inch embedment into the recommended bearing materials. If the soils exposed in the excavation bottom are soft or loose, compaction of the soils will be required prior to placing steel or concrete. Compaction of the foundation excavation bottom is typically accomplished with a compaction wheel or mechanical whacker and must be observed and approved in writing by a Geocon representative.

8.1.10 Where new paving is to be placed, it is recommended that all existing fill and soft alluvial soils be excavated and properly compacted for paving support. The client should be aware that excavation and compaction of all existing fill and soft alluvial soils in the area of new paving is not required; however, paving constructed over existing uncertified fill or unsuitable alluvial soil may experience increased settlement and/or cracking, and may therefore have a shorter design life and increased maintenance costs. As a minimum, the upper 12 inches of subgrade soil should be scarified and properly compacted for paving support. Paving recommendations are provided in *Preliminary Pavement Recommendations* section of this report (see Section 8.13).

8.1.11 Based on the shallow groundwater and impermeable nature of the fine grained soils which underly the site, infiltration of stormwater at this site is not considered feasible. Infiltration of stormwater at this site would be considered detrimental to the project. It is recommended that stormwater be retained, filtered, and discharged in accordance with the requirements of the local governing agency.

8.1.12 It should be noted that implementation of the recommendations presented herein is not intended to completely prevent damage to the structure during the occurrence of strong ground shaking as a result of nearby earthquakes. It is intended that the structure be designed in such a way that the amount of damage incurred as a result of strong ground shaking be minimized.

8.1.13 It is recommended that flexible utility connections be utilized for all rigid utilities to minimize or prevent damage to utilities from minor differential movements.

8.1.14 Once the design and foundation loading configuration for the proposed structure proceeds to a more finalized plan, the recommendations within this report should be reviewed and revised, if necessary. Based on the final foundation loading configurations, the potential for settlement should be reevaluated by this office.

8.1.15 Any changes in the design, location or elevation of improvements, as outlined in this report, should be reviewed by this office. Geocon should be contacted to determine the necessity for review and possible revision of this report.

8.2 Soil and Excavation Characteristics

8.2.1 The in-situ soils can be excavated with moderate effort using conventional excavation equipment. Some caving should be anticipated in unshored excavations, especially where granular soils are encountered.

8.2.2 It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable OSHA rules and regulations to maintain safety and maintain the stability of existing adjacent improvements.

8.2.3 All onsite excavations must be conducted in such a manner that potential surcharges from existing structures, construction equipment, and vehicle loads are resisted. The surcharge area may be defined by a 1:1 projection down and away from the bottom of an existing foundation or vehicle load. Penetrations below this 1:1 projection will require special excavation measures such as sloping or shoring. Excavation recommendations are provided in the *Temporary Excavations* section of this report (see Section 8.18).

8.2.4 The upper 5 feet of existing site soils encountered during the investigation are considered to have a “medium” expansive potential (EI = 63) and are classified as “expansive” in accordance with the 2019 California Building Code (CBC) Section 1803.5.3. The recommendations presented herein assume that the building foundations and slabs will derive support in these materials.

8.3 Minimum Resistivity, pH, and Water-Soluble Sulfate

8.3.1 Potential of Hydrogen (pH) and resistivity testing, as well as chloride content testing, were performed on representative samples of on-site material to generally evaluate the corrosion potential to surface utilities. The tests were performed in accordance with California Test Method Nos. 643 and 422 and indicate that the soils are considered “moderately corrosive” to “severely corrosive” with respect to corrosion of buried ferrous metals on site. The results are presented in Appendix B (Figure B23) and should be considered for design of underground structures. Due to the corrosive potential of the soils, it is suggested that ABS pipes be considered in lieu of cast-iron for subdrains and retaining wall drains beneath the structure.

8.3.2 Laboratory tests were performed on representative samples of the site materials to measure the percentage of water-soluble sulfate content. Results from the laboratory water-soluble sulfate tests are presented in Appendix B (Figure B23) and indicate that the on-site materials possess a sulfate exposure class of “S0” to concrete structures as defined by 2019 CBC Section 1904 and ACI 318-14 Table 19.3.1.1.

8.3.3 Geocon West, Inc. does not practice in the field of corrosion engineering and mitigation. If corrosion sensitive improvements are planned, it is recommended that a corrosion engineer be retained to evaluate corrosion test results and incorporate the necessary precautions to avoid premature corrosion of buried metal pipes and concrete structures in direct contact with the soils.

8.4 Grading

8.4.1 Grading is anticipated to include preparation of building pads and paving subgrade, excavation of site soils for proposed foundations and utility trenches, as well as placement of backfill for utility trenches.

8.4.2 A preconstruction conference should be held at the site prior to the beginning of grading operations with the owner, contractor, civil engineer and soil engineer in attendance. Special soil handling requirements can be discussed at that time.

8.4.3 Earthwork should be observed, and compacted fill tested by representatives of Geocon West, Inc. The existing fill and alluvial soils encountered during exploration are suitable for reuse as engineered fill, provided any encountered oversize material (greater than 6 inches) and any encountered deleterious debris is removed.

8.4.4 Grading should commence with the removal of all existing vegetation and existing improvements from the area to be graded. Deleterious debris such as wood and root structures should be exported from the site and should not be mixed with the fill soils. Asphalt and concrete should not be mixed with the fill soils unless approved by the Geotechnical Engineer. All existing underground improvements planned for removal should be completely excavated and the resulting depressions properly backfilled in accordance with the procedures described herein. Once a clean excavation bottom has been established it must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon West, Inc.).

8.4.5 For support of a mat foundation, it is recommended that the upper 6 feet of existing earth materials within the proposed building footprint areas be excavated and properly compacted for foundation and slab support. Deeper excavations should be conducted as necessary to remove deeper artificial fill or soft alluvial soil at the direction of the Geotechnical Engineer (a representative of Geocon). Proposed building foundations should be underlain by a minimum of 4 feet of newly placed engineered fill. The excavation should extend laterally a minimum distance of 3 feet beyond the building footprint area, including building appurtenances, or a distance equal to the depth of fill below the foundation, whichever is greater. The contractor should be aware that up to 9 feet of artificial fill was encountered in Boring B3. The limits of existing fill and/or soft alluvial soils removal will be verified by the Geocon representative during site grading activities.

8.4.6 All excavations must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon). If determined to be excessively soft, stabilization of the bottom of the excavation may be required in order to provide a firm working surface upon which engineered fill can be placed and heavy equipment can operate.

8.4.7 Prior to placing fill or constructing proposed improvements, a stable excavation bottom must be established. In areas where the subgrade is saturated or soft, proper compaction will likely not be possible or achieved in a timely manner without introducing stabilization measures. If subgrade stabilization is required at the excavation bottom, rubber tire equipment should not be allowed in the excavation bottom until it is stabilized or extensive soil disturbance could result. It is suggested that excavation and grading be performed during the summer season to promote moisture control of the soils. In addition, the use of track equipment should be used to minimize disturbance to the soils at the excavation bottom.

8.4.8 Bottom stabilization, if necessary, may be achieved placing a thin lift of 3- to 6-inch-diameter crushed angular rock into the soft excavation bottom. The use of crushed concrete will also be acceptable. The crushed rock should be spread thinly across the excavation bottom and pressed into the soils by track rolling or wheel rolling with heavy equipment. It is very important that voids between the rock fragments are not created so the rock must be thoroughly pressed or blended into the soils. All subgrade soils must be properly compacted and proof-rolled in the presence of the Geotechnical Engineer (a representative of Geocon West, Inc.).

8.4.9 An alternative method of subgrade stabilization may be accomplished by placing a one-foot-thick layer of washed, angular 3/4-inch gravel atop a stabilization fabric (Mirafi 500X or equivalent) subsequent to subgrade approval. Stabilization fabric should also be placed over the top of the gravel. This procedure should be conducted in sections until the entire excavation bottom has been blanketed by fabric and gravel. Heavy equipment may operate on the gravel once it has been placed. The gravel should be compacted to a dense state using a vibratory drum roller. It is recommended that the contractor meet with the Geotechnical Engineer to discuss this procedure in more detail.

8.4.10 The upper soils encountered during site exploration were moist to wet and the grading contractor should be aware that the existing soils are currently above optimum moisture content. Conditions could change seasonally. If the soils are more than 3 percent above the optimum moisture content at the time of construction the soils will likely require spreading, processing, and drying activities in order to achieve proper compaction.

8.4.11 All fill and backfill soils should be placed in horizontal loose layers approximately 6 to 8 inches thick, moisture conditioned to near 2 percent above optimum moisture content, and properly compacted to a minimum of 90 percent of the maximum dry density per ASTM D 1557 (latest edition).

8.4.12 It is anticipated that stable excavations for the recommended grading can be achieved with sloping measures. However, if excavations in close proximity to an adjacent property line and/or structure are required, special excavation measures may be necessary in order to maintain lateral support of offsite improvements. Excavation recommendations are provided in the *Temporary Excavations* section of this report (see Section 8.18).

8.4.13 Although not anticipated for this project, all imported fill shall be observed, tested, and approved by Geocon West, Inc. prior to bringing soil to the site. Rocks larger than 6 inches in diameter shall not be used in the fill. If necessary, import soils used as structural fill should have an expansion index less than 50 and corrosivity properties that are equally or less detrimental to that of the existing onsite soils (see Figure B23).

8.4.14. Where new paving is to be placed, it is recommended that all existing fill and soft alluvium be excavated and properly compacted for paving support. As a minimum, the upper 12 inches of soil should be scarified, moisture conditioned to near two percent over optimum moisture content, and compacted to at least 92 percent relative compaction, as determined by ASTM Test Method D 1557 (latest edition). Paving recommendations are provided in *Preliminary Pavement Recommendations* section of this report (see Section 8.13).

8.4.15 Foundations for small outlying structures, such as block walls up to 6 feet in height, planter walls or trash enclosures, which will not be tied to the proposed structure, may be supported on conventional foundations deriving support on a minimum of 12 inches of newly placed engineered fill which extends laterally at least 12 inches beyond the foundation area. Where excavation and compaction cannot be performed or is undesirable, foundations may derive support directly in the competent undisturbed alluvial soils and should be deepened as necessary to maintain a minimum 12 inch embedment into the recommended bearing materials. If the soils exposed in the excavation bottom are soft or loose, compaction of the soils will be required prior to placing steel or concrete. Compaction of the foundation excavation bottom is typically accomplished with a compaction wheel or mechanical whacker and must be observed and approved by a Geocon representative.

8.4.16 It is recommended that flexible utility connections be utilized for all rigid utilities to minimize or prevent damage to utilities from minor differential movements. Utility trenches should be properly backfilled in accordance with the requirements of the Green Book (latest edition). The pipe should be bedded with clean sands (Sand Equivalent greater than 30) to a depth of at least 1 foot over the pipe, and the bedding material must be inspected and approved in writing by the Geotechnical Engineer (a representative of Geocon). The use of gravel is not acceptable unless used in conjunction with filter fabric to prevent the gravel from having direct contact with soil. The remainder of the trench backfill may be derived from onsite soil or approved import soil, compacted as necessary, until the required compaction is obtained. The use of minimum 2-sack slurry as backfill is also acceptable. Prior to placing any bedding materials or pipes, the trench excavation bottom must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon).

8.4.17 All trench and foundation excavation bottoms must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon), prior to placing bedding sands, fill, steel, gravel, or concrete.

8.5 Shrinkage

8.5.1 Shrinkage results when a volume of material removed at one density is compacted to a higher density. A shrinkage factor between 10 and 15 percent should be anticipated when excavating and compacting the upper 5 feet of existing earth materials on the site to an average relative compaction of 92 percent.

8.5.2 If import soils will be utilized in the building pad, the soils must be placed uniformly and at equal thickness at the direction of the Geotechnical Engineer (a representative of Geocon West, Inc.). Soils can be borrowed from non-building pad areas and later replaced with imported soils.

8.6 Mat Foundation Design

8.6.1 Subsequent to the recommended grading, a reinforced concrete mat foundation may be utilized for support of the proposed structures. The reinforced concrete mat foundation should derive support in the newly placed engineered fill and be underlain by at least 4 feet of newly placed engineered fill.

8.6.2 Foundation excavations should be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon West, Inc.), prior to the placement of reinforcing steel and concrete to verify that the excavations and exposed soil conditions are consistent with those anticipated. If unanticipated soil conditions are encountered, foundation modifications may be required.

8.6.3 It is anticipated that the mat foundation constructed for the on-grade structure will impart an average pressure between 2,000 psf to 3,500 psf. The recommended maximum allowable bearing value is 3,500 psf. The allowable bearing pressure may be increased by up to one-third for transient loads due to wind or seismic forces.

8.6.4 A vertical modulus of subgrade reaction of 100 pci may be used in the design of mat foundations deriving support in competent alluvial soils. This value is a unit value for use with a 1-foot square footing. The modulus should be reduced in accordance with the following equation when used with larger foundations:

$$K_R = K\left[\frac{B+1}{2B}\right]^2$$

where: K_R = reduced subgrade modulus
K = unit subgrade modulus
B = foundation width (in feet)

8.6.5 The thickness of and reinforcement for the mat foundation should be designed by the project structural engineer.

8.6.6 For seismic design purposes, a coefficient of friction of 0.35 may be utilized between the concrete mat and newly placed engineered fill without a moisture barrier, and 0.15 for slabs underlain by a moisture barrier.

8.6.7 The enclosed liquefaction settlement analyses indicate that the site soils could be susceptible to less than ½ inch of total seismic settlement as a result of the Design Earthquake peak ground acceleration (⅔PGA_M). Differential settlement at the foundation level is anticipated to be less than ¼ inches over a distance of 20 feet. The foundation design recommendations presented herein are intended to minimize the effects of settlement on proposed improvements.

8.6.8 The maximum expected total settlement for a structure support on a mat foundation system designed with the maximum allowable bearing value of 3,500 psf and deriving support in the recommended bearing materials is estimated to be approximately 2 inches and occur below the heaviest loaded structural element. A majority of the settlement of the foundation system is expected to occur on initial application of loading; however, additional settlements are expected within the first twelve months. Differential settlement is not expected to exceed 1 inch over a distance of 20 feet.

8.6.9 Based on these considerations is it recommended that the proposed structure, designed with a maximum allowable bearing value of 3,500 psf, be designed for a combined static and seismically induced differential settlement of 1 ½ inch over a distance of 20 feet.

8.6.10 This office should be provided a copy of the final construction plans so that the excavation recommendations presented herein could be properly reviewed and revised if necessary.

8.6.11 Once the design and foundation loading configurations for the proposed structures proceeds to a more finalized plan, the estimated settlements presented in this report should be reviewed and revised, if necessary. If the final foundation loading configurations are greater than the assumed loading conditions, the potential for settlement should be reevaluated by this office.

8.7 Miscellaneous Foundations

8.7.1 Foundations for small outlying structures, such as block walls up to 6 feet in height, planter walls or trash enclosures, which will not be tied to the proposed structure, may be supported on conventional foundations deriving support on a minimum of 12 inches of newly placed engineered fill which extends laterally at least 12 inches beyond the foundation area. Where excavation and compaction cannot be performed or is undesirable, foundations may derive support directly in the competent undisturbed alluvial soils, and should be deepened as necessary to maintain a minimum 12 inch embedment into the recommended bearing materials.

8.7.2 If the soils exposed in the excavation bottom are soft, compaction of the soft soils will be required prior to placing steel or concrete. Compaction of the foundation excavation bottom is typically accomplished with a compaction wheel or mechanical whacker and must be observed and approved by a Geocon representative. Miscellaneous foundations may be designed for a bearing value of 1,500 psf, and should be a minimum of 12 inches in width, 24 ,inches in depth below the lowest adjacent grade and 12 inches into the recommended bearing material. The allowable bearing pressure may be increased by up to one-third for transient loads due to wind or seismic forces.

8.7.3 Foundation excavations should be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon West, Inc.), prior to the placement of reinforcing steel and concrete to verify that the excavations and exposed soil conditions are consistent with those anticipated.

8.8 Lateral Design

8.8.1 Resistance to lateral loading may be provided by friction acting at the base of foundations, slabs and by passive earth pressure. An allowable coefficient of friction of 0.35 may be used with the dead load forces in the undisturbed alluvial soils and newly placed engineered fill.

8.8.2 Passive earth pressure for the sides of foundations and slabs poured against newly placed engineered fill or undisturbed alluvial soils may be computed as an equivalent fluid having a density of 230 pounds per cubic foot (pcf) with a maximum earth pressure of 2,300 psf. When combining passive and friction for lateral resistance, the passive component should be reduced by one-third. A one-third increase in the passive value may be used for wind or seismic loads.

8.9 Concrete Slabs-on-Grade

8.9.1 Exterior concrete slabs-on-grade subject to vehicle loading should be designed in accordance with the recommendations in the *Preliminary Pavement Recommendations* section of this report (Section 8.10).

8.9.2 Slabs-on-grade at the ground surface that may receive moisture-sensitive floor coverings or may be used to store moisture-sensitive materials should be underlain by a vapor retarder placed directly beneath the slab. The vapor retarder and acceptable permeance should be specified by the project architect or developer based on the type of floor covering that will be installed. The vapor retarder design should be consistent with the guidelines presented in Section 9.3 of the American Concrete Institute's (ACI) Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials (ACI 302.2R-06) and should be installed in general conformance with ASTM E 1643 (latest edition) and the manufacturer's recommendations. A minimum thickness of 15 mils extruded polyolefin plastic is recommended; vapor retarders which contain recycled content or woven materials are not recommended. The vapor retarder should have a permeance of less than 0.01 perms demonstrated by testing before and after mandatory conditioning. The vapor retarder should be installed in direct contact with the concrete slab with proper perimeter seal. If the Los Angeles Green Building Code requirements apply to this project, the vapor retarder should be underlain by 4 inches of clean aggregate. It is important that the vapor retarder be puncture resistant since it will be in direct contact with angular gravel. As an alternative to the clean aggregate suggested in the Los Angeles Green Building Code, it is our opinion that the concrete slab-on-grade may be underlain by a vapor retarder over 4 inches of clean sand (sand equivalent greater than 30), since the sand will serve a capillary break and will minimize the potential for punctures and damage to the vapor barrier.

8.9.3 For seismic design purposes, a coefficient of friction of 0.35 may be utilized between concrete slabs and subgrade soils without a moisture barrier, and 0.15 for slabs underlain by a moisture barrier.

8.9.4 Exterior slabs, not subject to traffic loads, should be at least 4 inches thick and reinforced with No. 3 steel reinforcing bars placed 18 inches on center in both horizontal directions, positioned near the slab midpoint. Prior to construction of slabs, the upper 12 inches of subgrade should be moistened to optimum moisture content and properly compacted to at least 92 percent relative compaction, as determined by ASTM Test Method D 1557 (latest edition). Crack control joints should be spaced at intervals not greater than 10 feet and should be constructed using saw-cuts or other methods as soon as practical following concrete placement. Crack control joints should extend a minimum depth of one-fourth the slab thickness. The project structural engineer should design construction joints as necessary.

8.9.5 Due to the expansive potential of the anticipated subgrade soils, the moisture content of the slab subgrade should be maintained and sprinkled as necessary to maintain a moist condition as would be expected in any concrete placement. Furthermore, consideration should be given to doweling slabs into adjacent curbs and foundations to minimize movements and offsets which could lead to a potential tripping hazard.

8.9.6 The recommendations of this report are intended to reduce the potential for cracking of slabs due to settlement. However, even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade may exhibit some cracking due to minor soil movement and/or concrete shrinkage. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.

8.10 Preliminary Paving Design

8.10.1 Where new paving is to be placed, it is recommended that all existing fill and soft alluvium materials be excavated and properly compacted for paving support. The client should be aware that excavation and compaction of all existing artificial fill and soft alluvium in the area of new paving is not required; however, paving constructed over existing uncertified fill or unsuitable alluvium material may experience increased settlement and/or cracking, and may therefore have a shorter design life and increased maintenance costs. As a minimum, the upper 12 inches of paving subgrade should be scarified, moisture conditioned to at least 2 percent above optimum moisture content, and properly compacted to at least 92 percent relative compaction, as determined by ASTM Test Method D 1557 (latest edition).

8.10.2 The following pavement sections are based on an assumed R-Value of 20. Once site grading activities are complete an R-Value should be obtained by laboratory testing to confirm the properties of the soils serving as paving subgrade, prior to placing pavement.

8.10.3 The Traffic Indices listed below are estimates. Geocon does not practice in the field of traffic engineering. The actual Traffic Index for each area should be determined by the project civil engineer. If pavement sections for Traffic Indices other than those listed below are required, Geocon should be contacted to provide additional recommendations. Pavement thicknesses were determined following procedures outlined in the *California Highway Design Manual* (Caltrans). It is anticipated that the majority of traffic will consist of automobile and large truck traffic.

PRELIMINARY PAVEMENT DESIGN SECTIONS

Location	Estimated Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
Automobile Parking and Driveways	4.0	3.0	4.0
Trash Truck & Fire Lanes	7.0	4.0	12.0

8.10.4 Asphalt concrete should conform to Section 203-6 of the "*Standard Specifications for Public Works Construction*" (Green Book). Class 2 aggregate base materials should conform to Section 26-1.02A of the "*Standard Specifications of the State of California, Department of Transportation*" (Caltrans). The use of Crushed Miscellaneous Base (CMB) in lieu of Class 2 aggregate base is acceptable. Crushed Miscellaneous Base should conform to Section 200-2.4 of the "*Standard Specifications for Public Works Construction*" (Green Book).

8.10.5 Unless specifically designed and evaluated by the project structural engineer, where exterior concrete paving will be utilized for support of vehicles, it is recommended that the concrete be a minimum of 6 inches of concrete reinforced with No. 3 steel reinforcing bars placed 18 inches on center in both horizontal directions. Concrete paving supporting vehicular traffic should be underlain by a minimum of 4 inches of aggregate base and a properly compacted subgrade. As a minimum, the upper 12 inches of paving subgrade should be scarified, moisture conditioned to 2 percent above optimum moisture content, and properly compacted to at least 92 percent relative compaction, as determined by ASTM Test Method D 1557 (latest edition). The base material should be compacted to 95 percent relative compaction as determined by ASTM Test Method D 1557 (latest edition).

8.10.6 The performance of pavements is highly dependent upon providing positive surface drainage away from the edge of pavements. Ponding of water on or adjacent to the pavement will likely result in saturation of the subgrade materials and subsequent cracking, subsidence and pavement distress. If planters are planned adjacent to paving, it is recommended that the perimeter curb be extended at least 12 inches below the bottom of the aggregate base to minimize the introduction of water beneath the paving.

8.11 Retaining Wall Design

8.11.1 The recommendations presented below are generally applicable to the design of rigid concrete or masonry retaining walls having a maximum height of 5 feet. In the event that walls significantly higher than 5 feet are planned, Geocon should be contacted for additional recommendations.

8.11.2 Retaining wall foundations should be designed in accordance with the recommendations provided in the *Foundation Design* section of this report (see Sections 8.6 through 8.9).

8.11.3 Retaining walls with a level backfill surface that are not restrained at the top should be designed utilizing a triangular distribution of pressure (active pressure). Restrained walls are those that are not allowed to rotate more than 0.001H (where H equals the height of the retaining portion of the wall in feet) at the top of the wall. Where walls are restrained from movement at the top, walls may be designed utilizing a triangular distribution of pressure (at-rest pressure). The table on the following page presents recommended pressures to be used in retaining wall design.

RETAINING WALL WITH LEVEL BACKFILL SURFACE

HEIGHT OF RETAINING WALL (Feet)	ACTIVE PRESSURE EQUIVALENT FLUID PRESSURE (Pounds Per Cubic Foot)	AT-REST PRESSURE EQUIVALENT FLUID PRESSURE (Pounds Per Cubic Foot)
Up to 5	30	74

8.11.4 The wall pressures provided above assume that the proposed retaining walls will support a wedge of engineered fill derived from onsite soils. If import soil will be used to backfill proposed retaining walls, revised earth pressures may be required to account for the geotechnical properties of the import soil used as engineered fill. This should be evaluated once the use of import soil is established. All imported fill shall be observed, tested, and approved by Geocon West, Inc. prior to bringing soil to the site.

8.11.5 The wall pressures provided above assume that the retaining wall will be properly drained preventing the buildup of hydrostatic pressure. If retaining wall drainage is not implemented, the equivalent fluid pressure to be used in design of undrained walls is 100 pcf. The value includes hydrostatic pressures plus buoyant lateral earth pressures.

8.11.6 Additional active pressure should be added for a surcharge condition due to sloping ground, vehicular traffic or adjacent structures and should be designed for each condition as the project progresses. Surcharges may be evaluated using Section 8.19 of this report. Once the design becomes more finalized, an addendum letter can be prepared revising recommendations and addressing specific surcharge conditions throughout the project, if necessary.

8.12 Retaining Wall Drainage

8.12.1 Where not designed for hydrostatic pressure, retaining walls should be provided with a drainage system. At the base of the drain system, a subdrain covered with a minimum of 12 inches of gravel should be installed, and a compacted fill blanket or other seal placed at the surface (see Figure 10). The clean bottom and subdrain pipe, behind a retaining wall, should be observed by the Geotechnical Engineer (a representative of Geocon), prior to placement of gravel or compacting backfill.

8.12.2 As an alternative, a plastic drainage composite such as Miradrain or equivalent may be installed in continuous, 4-foot-wide columns along the entire back face of the wall, at 8 feet on center. The top of these drainage composite columns should terminate approximately 18 inches below the ground surface, where either hardscape or a minimum of 18 inches of relatively cohesive material should be placed as a cap (see Figure 11). These vertical columns of drainage material would then be connected at the bottom of the wall to a collection panel or a 1-cubic-foot rock pocket drained by a 4-inch subdrain pipe.

8.12.3 Subdrainage pipes at the base of the retaining wall drainage system should outlet to an acceptable location via controlled drainage structures.

8.12.4 Moisture affecting below grade walls is one of the most common post-construction complaints. Poorly applied or omitted waterproofing can lead to efflorescence or standing water. Particular care should be taken in the design and installation of waterproofing to avoid moisture problems, or actual water seepage into the structure through any normal shrinkage cracks which may develop in the concrete walls, floor slab, foundations and/or construction joints. The design and inspection of the waterproofing is not the responsibility of the geotechnical engineer. A waterproofing consultant should be retained in order to recommend a product or method, which would provide protection to subterranean walls, floor slabs and foundations.

8.13 Elevator Pit Design

8.13.1 The elevator pit slab and retaining wall should be designed by the project structural engineer. Elevator pit walls may be designed in accordance with the recommendations in the *Retaining Wall Design* section of this report (see Section 8.14).

8.13.2 Additional active pressure should be added for a surcharge condition due to sloping ground, vehicular traffic or adjacent foundations and should be designed for each condition as the project progresses.

8.13.3 If retaining wall drainage is to be provided, the drainage system should be designed in accordance with the *Retaining Wall Drainage* section of this report (see Section 8.15).

8.13.4 It is suggested that the exterior walls and slab be waterproofed to prevent excessive moisture inside of the elevator pit. Waterproofing design and installation is not the responsibility of the geotechnical engineer.

8.14 Elevator Piston

8.14.1 If a plunger-type elevator piston is installed for this project, a deep drilled excavation will be required. It is important to verify that the drilled excavation is not situated immediately adjacent to a foundation, or the drilled excavation could compromise the existing foundation support, especially if the drilling is performed subsequent to the foundation construction.

8.14.2 Due to the preliminary nature of the project at this time, it is unknown if a plunger-type elevator piston will be included for this project. If in the future it is determined that a plunger-type elevator piston will be constructed, the location of the proposed elevator should be reviewed by the Geotechnical Engineer to evaluate the setback from foundations. Additional recommendations will be provided as necessary.

8.14.3 Some caving is anticipated in the granular soils below a depth of 20 feet. The contractor should be prepared to use casing and should have it readily available at the commencement of drilling activities. Continuous observation of the drilling and installation of the elevator piston by the Geotechnical Engineer (a representative of Geocon West, Inc.) is required.

8.14.4 The annular space between the piston casing and drilled excavation wall should be filled with a minimum of 1½-sack slurry pumped from the bottom up. As an alternative, pea gravel may be utilized. The use of soil to backfill the annular space is not acceptable.

8.15 Temporary Excavations

8.15.1 Excavations on the order of 6 feet in height are generally anticipated during grading activities, and isolated excavations up to 9 feet in height may also be required. The excavations are expected to expose artificial fill and alluvial soils, which may be subject to some caving where granular soils are exposed. Temporary vertical excavations up to 5 feet in height may be attempted where not surcharged by adjacent traffic or structures.

8.15.2 Vertical excavations greater than 5 feet or where surcharged by existing structures will require sloping or shoring measures in order to provide a stable excavation. Where sufficient space is available, temporary unsurcharged embankments could be sloped back at a uniform 1:1 slope gradient or flatter up to a maximum of 9 feet in height. A uniform slope does not have a vertical portion. Where space is limited, shoring measures will be required. *Shoring* recommendations can be provided under separate cover if necessary.

8.15.3 If excavations in close proximity to an adjacent property line and/or structure are required, special excavation measures such as slot-cutting or shoring may be necessary in order to maintain lateral support of offsite improvements. Recommendations for slot-cutting and shoring can be provided under separate cover.

8.15.4 Where sloped embankments are utilized, the top of the slope should be barricaded to prevent vehicles and storage loads at the top of the slope within a horizontal distance equal to the height of the slope. If the temporary construction embankments are to be maintained during the rainy season, berms are suggested along the tops of the slopes where necessary to prevent runoff water from entering the excavation and eroding the slope faces. Geocon personnel should inspect the soils exposed in the cut slopes during excavation so that modifications of the slopes can be made if variations in the soil conditions occur. All excavations should be stabilized within 30 days of initial excavation.

8.16 Surcharge from Adjacent Structures and Improvements

8.16.1 Additional pressure should be added for a surcharge condition due to sloping ground, vehicular traffic or adjacent structures and should be designed for each condition as the project progresses.

8.16.2 It is recommended that line-load surcharges from adjacent wall footings, use horizontal pressures generated from NAV-FAC DM 7.2. The governing equations are:

$$For\ {}^{x}/_{H} \leq 0.4$$

$$\sigma_H(z) = \frac{0.20 \times \left(\frac{z}{H}\right)}{\left[0.16 + \left(\frac{z}{H}\right)^2\right]^2} \times \frac{Q_L}{H}$$

and

$$For\ {}^{x}/_{H} > 0.4$$

$$\sigma_H(z) = \frac{1.28 \times \left(\frac{x}{H}\right)^2 \times \left(\frac{z}{H}\right)}{\left[\left(\frac{x}{H}\right)^2 + \left(\frac{z}{H}\right)^2\right]^2} \times \frac{Q_L}{H}$$

where x is the distance from the face of the excavation or wall to the vertical line-load, H is the distance from the bottom of the footing to the bottom of excavation or wall, z is the depth at which the horizontal pressure is desired, Q_L is the vertical line-load and $\sigma_H(z)$ is the horizontal pressure at depth z.

8.16.3 It is recommended that vertical point-loads, from construction equipment outriggers or adjacent building columns use horizontal pressures generated from NAV-FAC DM 7.2. The governing equations are:

$$For\ {}^{x}/_{H} \leq 0.4$$

$$\sigma_H(z) = \frac{0.28 \times \left(\frac{z}{H}\right)^2}{\left[0.16 + \left(\frac{z}{H}\right)^2\right]^3} \times \frac{Q_P}{H^2}$$

and

$$For\ {}^{x}/_{H} > 0.4$$

$$\sigma_H(z) = \frac{1.77 \times \left(\frac{x}{H}\right)^2 \times \left(\frac{z}{H}\right)^2}{\left[\left(\frac{x}{H}\right)^2 + \left(\frac{z}{H}\right)^2\right]^3} \times \frac{Q_P}{H^2}$$

then

$$\sigma'_H\,(z) = \sigma_H(z) cos^2(1.1\theta)$$

where x is the distance from the face of the excavation/wall to the vertical point-load, H is distance from the outrigger/bottom of column footing to the bottom of excavation, z is the depth at which the horizontal pressure is desired, Qp is the vertical point-load, $\sigma_H(z)$ is the horizontal pressure at depth z, θ is the angle between a line perpendicular to the excavation/wall and a line from the point-load to location on the excavation/wall where the surcharge is being evaluated, and $\sigma_H(z)$ is the horizontal pressure at depth z.

8.17 Surface Drainage

8.17.1 Proper surface drainage is critical to the future performance of the project. Uncontrolled infiltration of irrigation excess and storm runoff into the soils can adversely affect the performance of the planned improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change in the original designed engineering properties. Proper drainage should be maintained at all times.

8.17.2 All site drainage should be collected and controlled in non-erosive drainage devices. Drainage should not be allowed to pond anywhere on the site, and especially not against any foundation or retaining wall. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2019 CBC 1804.4 or other applicable standards. In addition, drainage should not be allowed to flow uncontrolled over any descending slope. Discharge from downspouts, roof drains and scuppers are not recommended onto unprotected soils within 5 feet of the building perimeter. Planters which are located adjacent to foundations should be sealed to prevent moisture intrusion into the soils providing foundation support. Landscape irrigation is not recommended within 5 feet of the building perimeter footings except when enclosed in protected planters.

8.17.3 Positive site drainage should be provided away from structures, pavement, and the tops of slopes to swales or other controlled drainage structures. The building pad and pavement areas should be fine graded such that water is not allowed to pond.

8.17.4 Landscaping planters immediately adjacent to paved areas are not recommended due to the potential for surface or irrigation water to infiltrate the pavement's subgrade and base course. Either a subdrain, which collects excess irrigation water and transmits it to drainage structures, or impervious above-grade planter boxes should be used. In addition, where landscaping is planned adjacent to the pavement, it is recommended that consideration be given to providing a cutoff wall along the edge of the pavement that extends at least 12 inches below the base material.

8.18 Plan Review

8.18.1 Grading, foundation, and shoring plans should be reviewed by the Geotechnical Engineer (a representative of Geocon West, Inc.), prior to finalization to verify that the plans have been prepared in substantial conformance with the recommendations of this report and to provide additional analyses or recommendations.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon West, Inc. should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon West, Inc.

2. This report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

3. The findings of this report are valid as of the date of this report. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

4. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

LIST OF REFERENCES

California Division of Mines and Geology, 1998, *Seismic Hazard Evaluation of the Torrance 7.5-Minute Quadrangle, Los Angeles County, California*, Open-File Report 98-26.

California Division of Mines and Geology, 1999; *State of California Seismic Hazard Zones, Torrance Quadrangle,* Official Map, Released: March 25, 1999.

California Division of Mines and Geology, 1986, *State of California, Special Studies Zones, Torrance Quadrangle, Revised Official Map,* Effective: July 1, 1986.

California Geologic Energy Management Division, 2021, Geologic Energy Management Division Well Finder, http://maps.conservation.ca.gov.doggr/index.html#close.

California Geological Survey, 2021a, CGS Information Warehouse, Regulatory Map Portal, http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps.

California Geological Survey, 2021b, Earthquake Zones of Required Investigation, https://maps.conservation.ca.gov/cgs/EQZApp/app/.

California Geological Survey, 2018, *Earthquake Fault Zones, A Guide for Government Agencies, Property Owners/Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California,* Special Publication 42, Revised 2018.

California Geological Survey, 2010, *Geologic Compilation of Quaternary Surficial Deposits in Southern California, Onshore Portion of the Long Beach 30' X 60' Quadrangle*, A Project for the Department of Water Resources by the California Geological Survey, Compiled from existing sources by Trinda L. Bedrossian, CEG and Peter D. Roffers, CGS Special Report 217, Plate 8, Scale 1:100,000.

Carson, City of, 2002, *Safety Element, Carson General Plan, Chapter 6.*

FEMA, 2021, Online Flood Hazard Maps, http://www.esri.com/hazards/index.html.

Jennings, C. W. and Bryant, W. A., 2010, *Fault Activity Map of California,* California Geological Survey Geologic Data Map No. 6.

Leighton and Associates, Inc., 1990, *Technical Appendix to the Safety Element of the Los Angeles County General Plan, Hazard Reduction in Los Angeles County*.

Los Angeles County Department of Public Works, 2021, Flood Zone Determination Website, http://dpw.lacounty.gov/apps/wmd/floodzone/map.htm.

State Water Resources Control Board, 2021, GeoTracker website, https://geotracker.waterboards.ca.gov/.

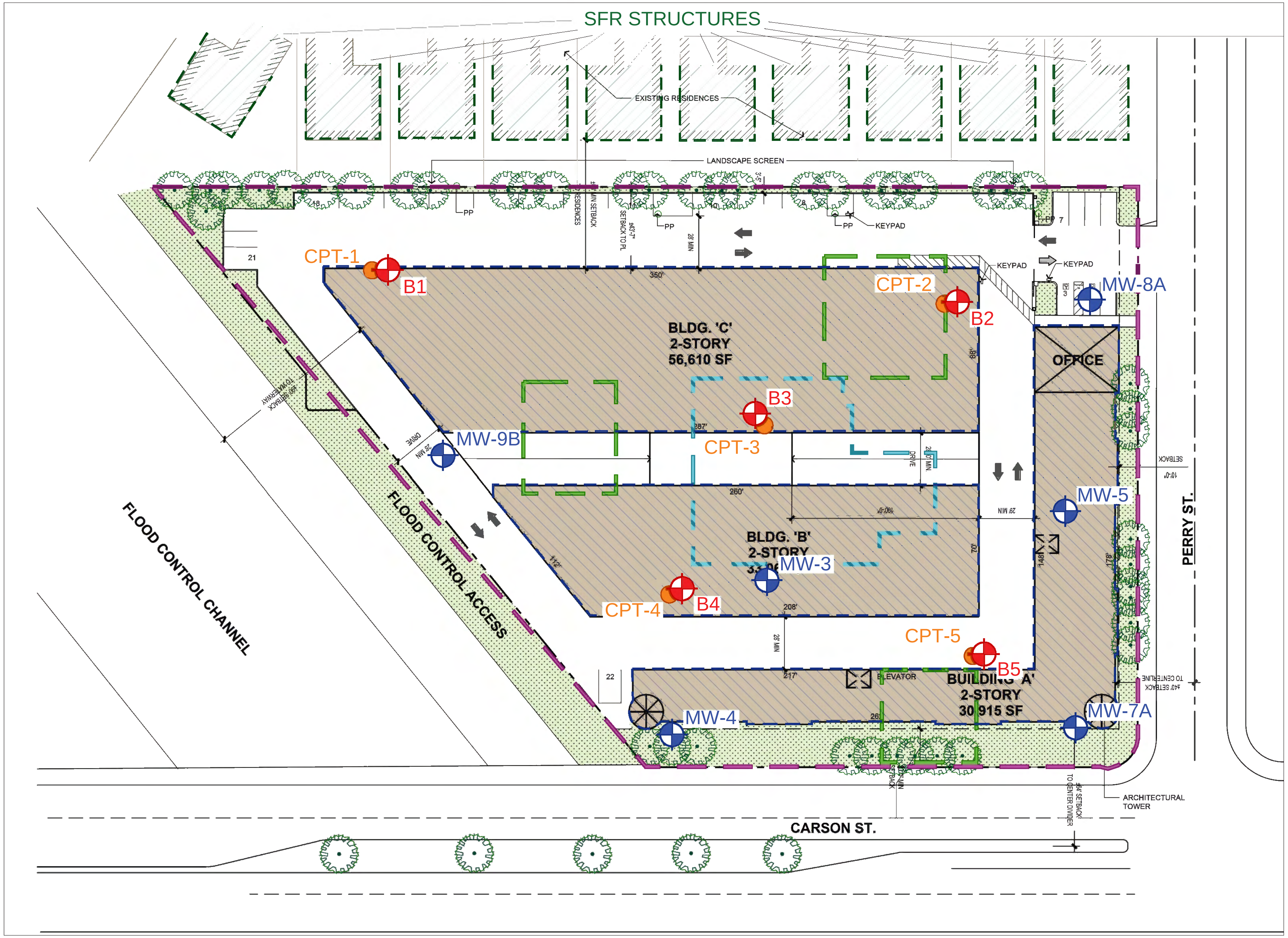
LIST OF REFERENCES (Continued)

Toppozada, T., Branum, D., Petersen, M., Hallstrom, C., and Reichle, M., 2000, *Epicenters and Areas Damaged by M> 5 California Earthquakes, 1800 – 1999,* California Geological Survey, Map Sheet 49.

U.S. Geological Survey and California Geological Survey, 2006, *Quaternary Fault and Fold Database for the United States,* accessed March 4, 2021 from USGS web site: http//earthquake.usgs.gov/hazards/qfaults/.

Yerkes, R. F., McCulloch, T. H., Schoellhamer, J. E., and Vedder, J. G., 1965, *Geology of the Los Angeles Basin–An Introduction*, U.S. Geological Survey Professional Paper 420-A .

Ziony, J. I., and Jones, L. M., 1989, *Map Showing Late Quaternary Faults and 1978–1984 Seismicity of the Los Angeles Region, California*, U.S. Geological Survey Miscellaneous Field Studies Map MF-1964.



LEGEND

B5 — Approximate Location of Boring

CPT-5 — Approximate Location of CPT

MW-9B — Approximate Location of Monitoring Well

Property Limits

Existing Off-Site Structures

Proposed New Medical Office Building

Extent of URS Removal and Recompaction (5 FT BGS)

Extent of URS Removal and Recompaction (8 FT BGS)

North

0 60' 120'

GEOCON
WEST, INC.
ENVIRONMENTAL GEOTECHNICAL MATERIALS
3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA 91504
PHONE (818) 841-8388 - FAX (818) 841-1704

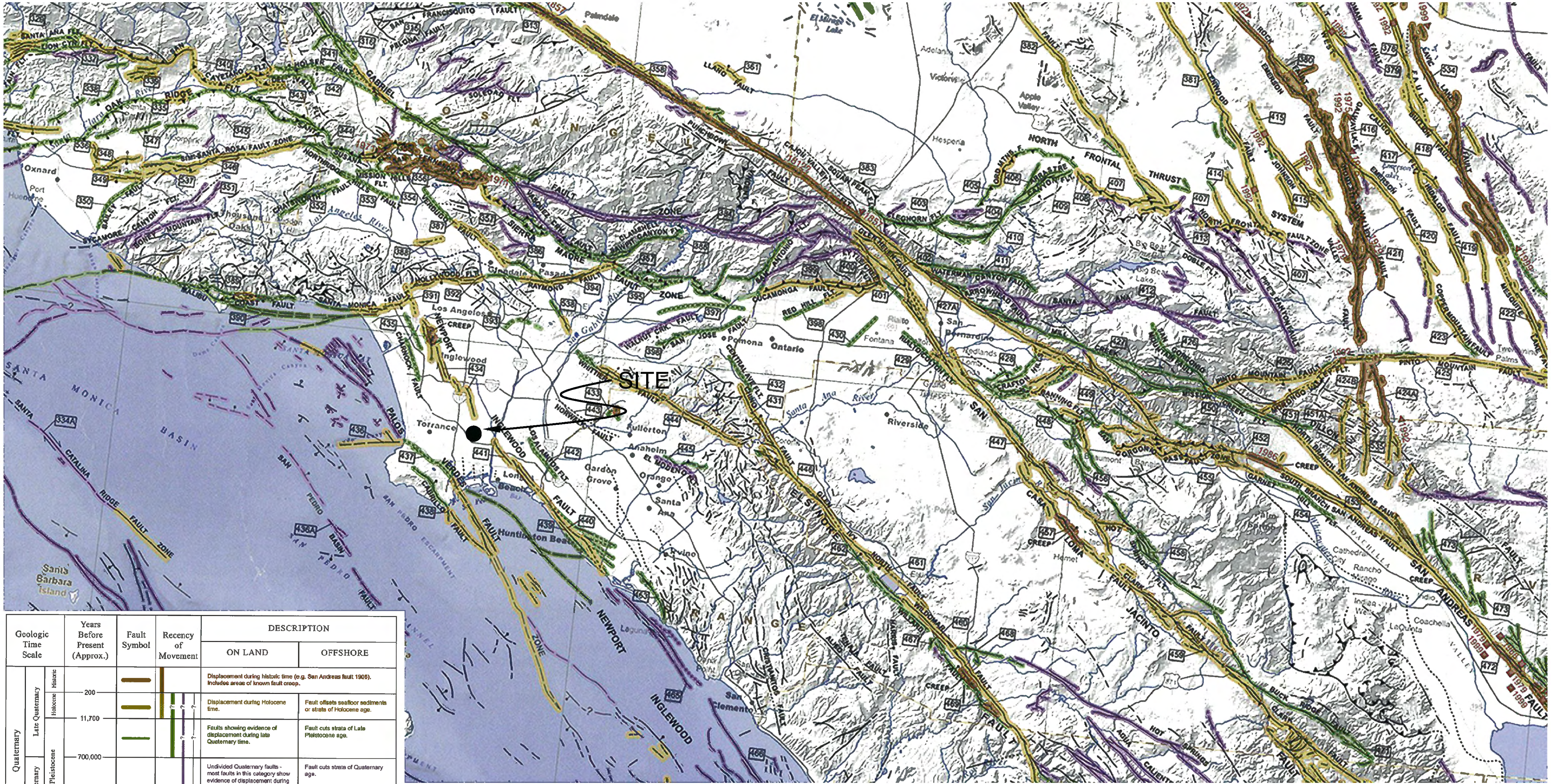
DRAFTED BY: JMH	CHECKED BY: JTA

SITE PLAN

21611 S PERRY STREET
CARSON, CALIFORNIA

APRIL 2021	PROJECT NO. W1301-06-01	FIG. 2

Reference: Jennings, C.W. and Bryant, W. A., 2010, Fault Activity Map of California, California Geological Survey Geologic Data Map No. 6.



Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION: ON LAND	DESCRIPTION: OFFSHORE
Quaternary	Late Quaternary	Historic				Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	200			Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
		Pleistocene	11,700			Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary		700,000			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			1,600,000*			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.
			4.5 billion (Age of Earth)				

* Quaternary now recognized as extending to 2.6 Ma (Walker and Geissman, 2009). Quaternary faults in this map were established using the previous 1.6 Ma criterion.

0 12 24 Miles

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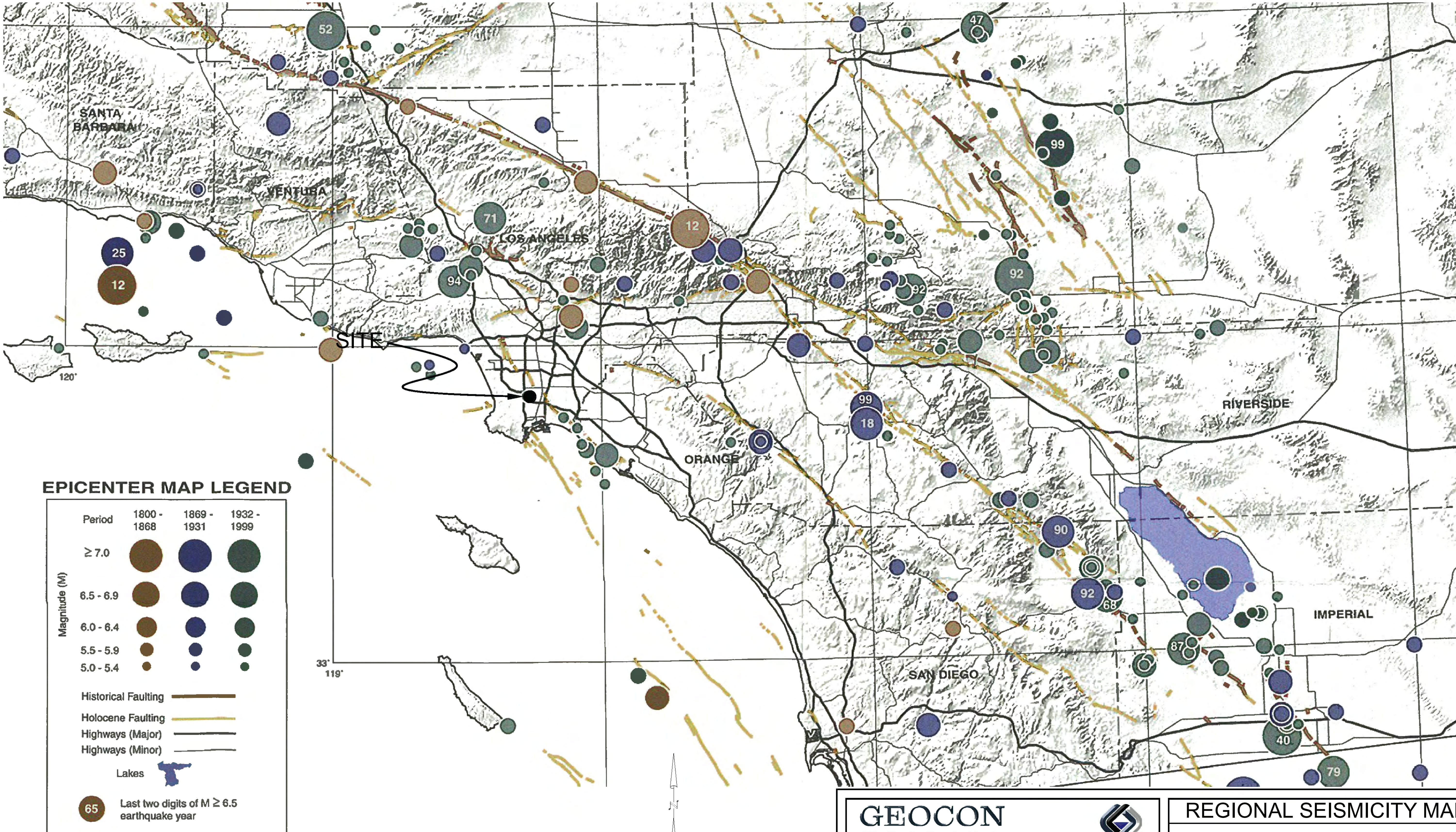
DRAFTED BY: CB | CHECKED BY: SFK

REGIONAL FAULT MAP

21611 SOUTH PERRY STREET
CARSON, CALIFORNIA

APRIL 2021 | PROJECT NO. W1301-06-01 | FIG. 3



Reference: Toppozada, T., Branum, D., Petersen, M., Hallstrom, C., Cramer, C., and Reichle, M., 2000, Epicenters and Areas Damaged by M≥5 California Earthquakes, 1800 - 1999, California Geological Survey, Map Sheet 49.

0 20 40 Miles

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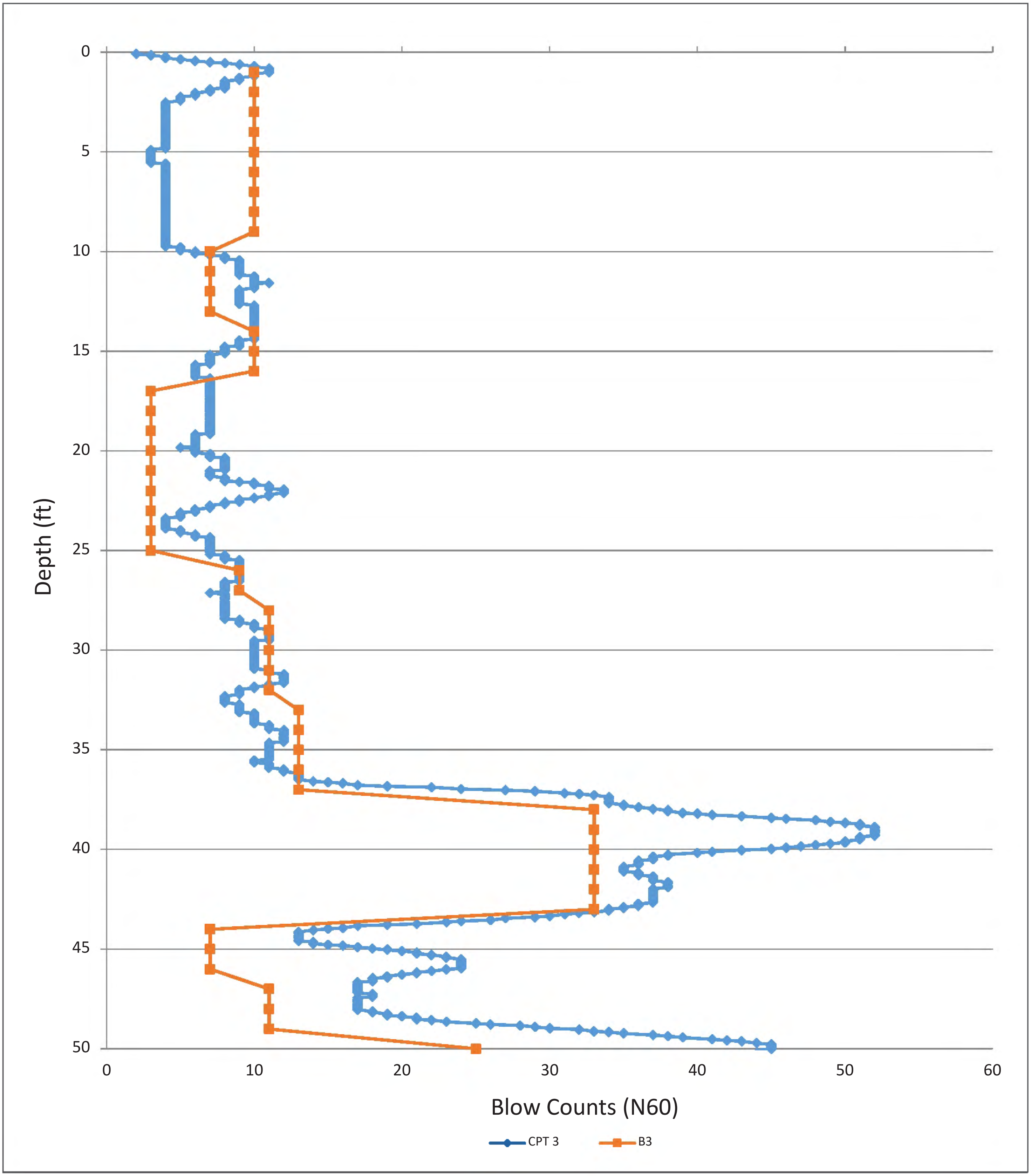
DRAFTED BY: CB | CHECKED BY: SFK

REGIONAL SEISMICITY MAP

21611 SOUTH PERRY STREET
CARSON, CALIFORNIA

APRIL 2021	PROJECT NO. W1301-06-01	FIG.4



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JMH		

CORRELATION OF BORING & CPT N60

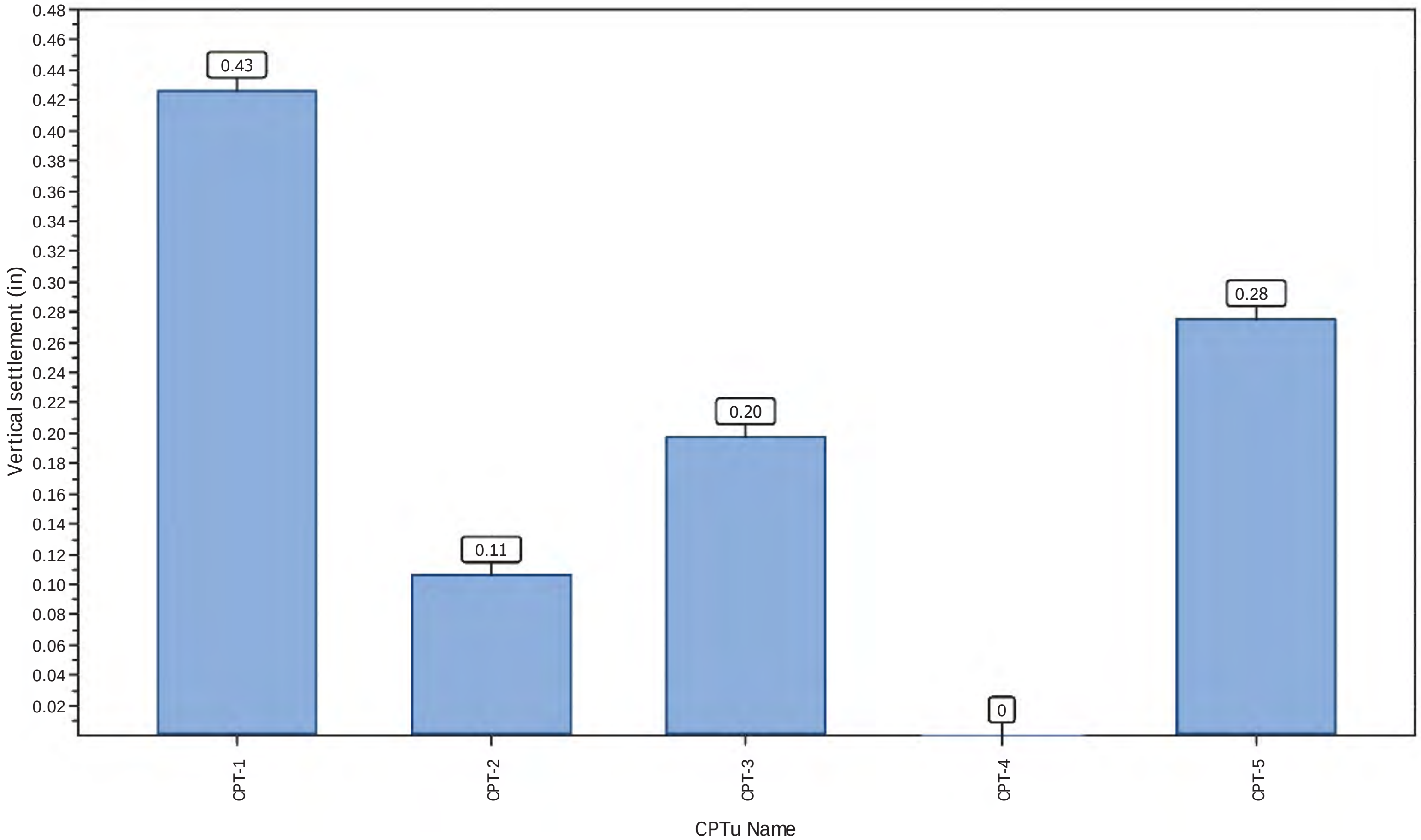
21611 SOUTH PERRY STREET
CARSON, CA

APRIL 2021	PROJECT NO. W1301-06-01	FIG.5

Project title : W1301-06-01

Location : Perry Street

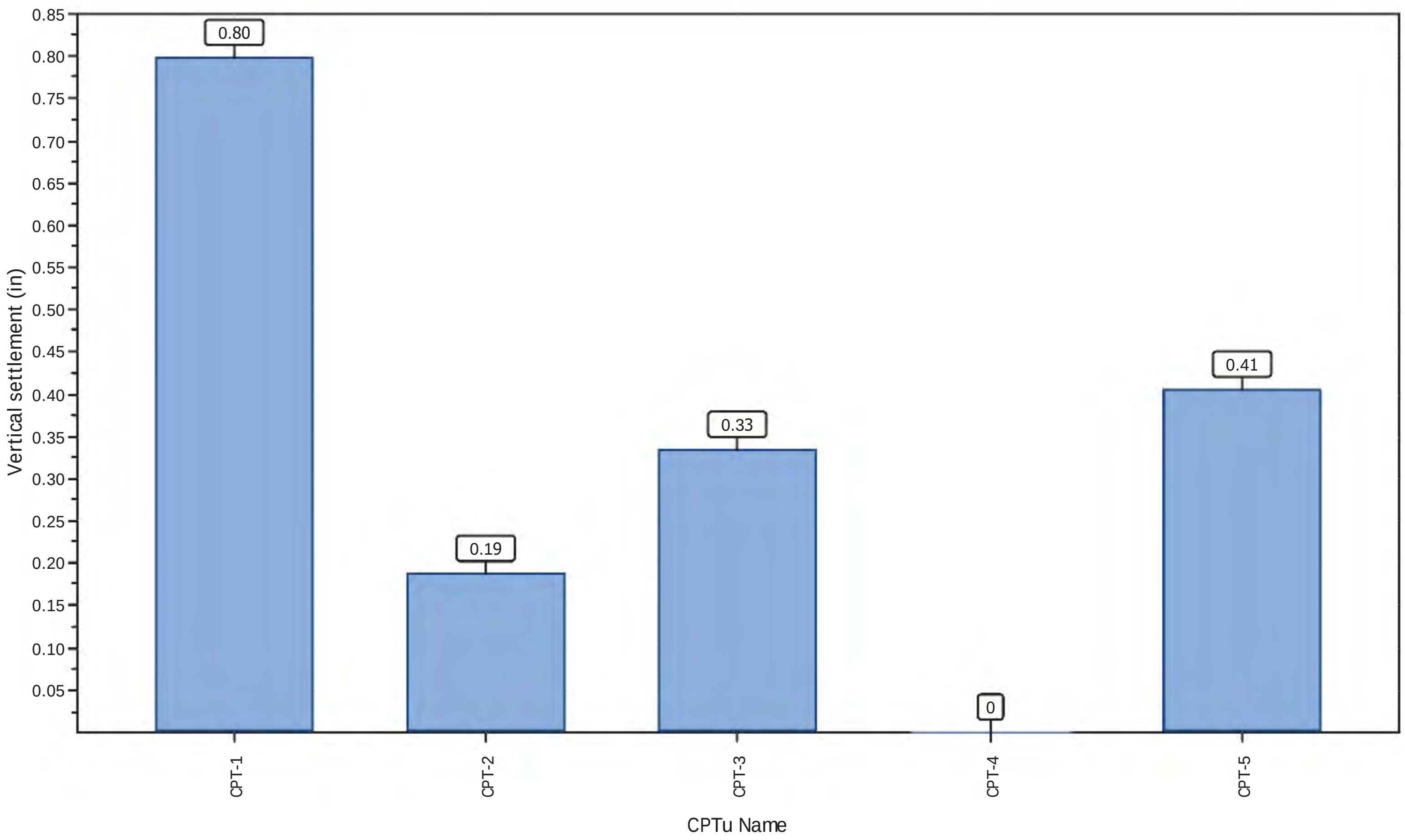
Overall vertical settlements report



Project title : W1301-06-01

Location : Perry Street

Overall vertical settlements report



GEOCON

Client : Perry Street
File No. : W1301-06-01
Boring : 3

TECHNICAL ENGINEERING AND DESIGN GUIDES AS ADAPTED FROM THE US ARMY CORPS OF ENGINEERS, NO. 9
EVALUATION OF EARTHQUAKE-INDUCED SETTLEMENTS IN DRY SANDY SOILS
DESIGN EARTHQUAKE

DE EARTHQUAKE INFORMATION:

Earthquake Magnitude:	6.68
Peak Horiz. Acceleration (g):	0.549

Depth of Base of Strata (ft)	Thickness of Layer (ft)	Depth of Mid-point of Layer (ft)	Soil Unit Weight (pcf)	Overburden Pressure at Mid-point (tsf)	Mean Effective Pressure at Mid-point (tsf)	Average Cyclic Shear Stress [Tav]	Field SPT [N]	Correction Factor [Cer]	Fig 4.1 Relative Density [Dr] (%)	Fig 4.2 Correction Factor [Cn]	Corrected [N1]60	rd Factor	Maximum Shear Mod. [Gmax] (tsf)	[yeff]*[Geff] / [Gmax]	Fig 4.4 yeff Shear Strain	[yeff]*100%	Volumetric Strain M7.5 [E15} (%)	Number of Strain Cycles [Nc]	Corrected Vol. Strains [Ec]	Estimated Settlement [S] (inches)
1.0	1.0	0.5	120.0	0.03	0.02	0.011	10	1.25	76.6	1.7	19.1	1.0	169.475	6.25E-05	1.00E-04	0.010	1.06E-02	8.4928	8.17E-03	0.00
2.0	1.0	1.5	120.0	0.09	0.06	0.032	10	1.25	74.4	1.7	19.1	1.0	293.540	1.06E-04	2.30E-04	0.023	2.43E-02	8.4928	1.88E-02	0.00
3.0	1.0	2.5	120.0	0.15	0.10	0.053	10	1.25	72.5	1.7	19.1	1.0	378.958	1.34E-04	1.70E-04	0.017	1.79E-02	8.4928	1.39E-02	0.00
4.0	1.0	3.5	120.0	0.21	0.14	0.075	10	1.25	70.7	1.7	19.1	1.0	448.389	1.56E-04	1.70E-04	0.017	1.79E-02	8.4928	1.39E-02	0.00
5.0	1.0	4.5	120.0	0.27	0.18	0.096	10	1.25	69.0	1.7	19.1	1.0	508.425	1.74E-04	1.70E-04	0.017	1.79E-02	8.4928	1.39E-02	0.00
6.0	1.0	5.5	120.0	0.33	0.22	0.117	10	1.25	67.4	1.7	19.1	1.0	562.085	1.88E-04	1.50E-04	0.015	1.58E-02	8.4928	1.23E-02	0.00
7.0	1.0	6.5	120.0	0.39	0.26	0.139	10	1.25	65.9	1.6	18.4	1.0	603.301	2.03E-04	4.50E-04	0.045	4.97E-02	8.4928	3.85E-02	0.01
8.0	1.0	7.5	120.0	0.45	0.30	0.160	10	1.25	64.5	1.5	17.1	1.0	632.776	2.20E-04	4.50E-04	0.045	5.42E-02	8.4928	4.19E-02	0.01
9.0	1.0	8.5	120.0	0.51	0.34	0.181	10	1.25	63.3	1.4	16.1	1.0	659.735	2.34E-04	4.50E-04	0.045	5.84E-02	8.4928	4.52E-02	0.01
10.0	1.0	9.5	120.0	0.57	0.38	0.202	7	1.25	52.2	1.4	10.7	1.0	607.907	2.79E-04	4.50E-04	0.045	9.58E-02	8.4928	7.41E-02	0.00
11.0	1.0	10.5	120.0	0.63	0.42	0.222	7	1.25	52.2	1.3	10.1	1.0	628.529	2.93E-04	4.50E-04	0.045	1.02E-01	8.4928	7.87E-02	0.00
12.0	1.0	11.5	120.0	0.69	0.46	0.243	7	1.25	52.2	1.2	9.8	0.9	650.354	3.05E-04	1.00E-03	0.100	2.35E-01	8.4928	1.82E-01	0.00
13.0	1.0	12.5	120.0	0.75	0.50	0.263	7	1.25	52.2	1.2	9.6	0.9	673.332	3.14E-04	7.10E-04	0.071	1.71E-01	8.4928	1.33E-01	0.00
14.0	1.0	13.5	120.0	0.81	0.54	0.284	10	1.25	59.6	1.2	14.4	0.9	802.030	2.80E-04	3.70E-04	0.037	5.47E-02	8.4928	4.23E-02	0.00
15.0	1.0	14.5	120.0	0.87	0.58	0.304	10	1.25	59.6	1.2	14.2	0.9	825.875	2.87E-04	3.70E-04	0.037	5.59E-02	8.4928	4.33E-02	0.00
16.0	1.0	15.5	120.0	0.93	0.62	0.324	10	1.25	59.6	1.1	13.9	0.9	848.608	2.93E-04	3.70E-04	0.037	5.72E-02	8.4928	4.43E-02	0.00
17.0	1.0	16.5	120.0	0.99	0.66	0.344	3	1.25	31.4	1.1	4.5	0.9	603.195	4.31E-04	1.20E-03	0.120	7.10E-01	8.4928	5.49E-01	0.00
18.0	1.0	17.5	120.0	1.05	0.70	0.364	3	1.25	31.4	1.1	4.5	0.9	617.634	4.39E-04	1.20E-03	0.120	7.24E-01	8.4928	5.61E-01	0.00
19.0	1.0	18.5	120.0	1.11	0.74	0.383	3	1.25	31.4	1.1	4.4	0.9	631.508	4.47E-04	1.20E-03	0.120	7.39E-01	8.4928	5.72E-01	0.00
20.0	1.0	19.5	120.0	1.17	0.78	0.402	3	1.25	31.4	1.1	4.3	0.9	644.865	4.53E-04	1.20E-03	0.120	7.54E-01	8.4928	5.83E-01	0.00
21.0	1.0	20.5	120.0	1.23	0.82	0.421	3	1.25	31.4	1.1	4.3	0.9	657.749	4.60E-04	1.20E-03	0.120	7.68E-01	8.4928	5.94E-01	0.00
22.0	1.0	21.5	120.0	1.29	0.86	0.440	3	1.25	31.4	1.0	4.2	0.9	670.198	4.65E-04	1.20E-03	0.120	7.82E-01	8.4928	6.05E-01	0.00
23.0	1.0	22.5	120.0	1.35	0.90	0.458	3	1.25	31.4	1.0	4.1	0.9	682.246	4.70E-04	1.20E-03	0.120	7.96E-01	8.4928	6.16E-01	0.00
24.0	1.0	23.5	120.0	1.41	0.94	0.477	3	1.25	31.4	1.0	4.1	0.9	693.922	4.75E-04	1.20E-03	0.120	8.10E-01	8.4928	6.27E-01	0.00
25.0	1.0	24.5	120.0	1.47	0.98	0.495	3	1.25	31.4	1.0	4.0	0.9	705.252	4.80E-04	1.20E-03	0.120	8.23E-01	8.4928	6.37E-01	0.00
26.0	1.0	25.5	120.0	1.53	1.03	0.513	9	1.25	52.3	1.0	12.7	0.9	1055.741	3.28E-04	5.20E-04	0.052	8.97E-02	8.4928	6.95E-02	0.00
27.0	1.0	26.5	120.0	1.59	1.07	0.530	9	1.25	52.3	1.0	12.5	0.9	1071.522	3.31E-04	5.20E-04	0.052	9.12E-02	8.4928	7.06E-02	0.00
28.0	1.0	27.5	120.0	1.65	1.11	0.547	11	1.25	55.9	1.0	15.8	0.9	1179.921	3.07E-04	5.20E-04	0.052	6.89E-02	8.4928	5.33E-02	0.00
29.0	1.0	28.5	120.0	1.71	1.15	0.564	11	1.25	55.9	0.9	15.6	0.9	1196.177	3.09E-04	5.20E-04	0.052	6.99E-02	8.4928	5.41E-02	0.00
30.0	1.0	29.5	120.0	1.77	1.19	0.581	11	1.25	55.9	0.9	15.4	0.9	1212.035	3.11E-04	5.20E-04	0.052	7.10E-02	8.4928	5.49E-02	0.00
31.0	1.0	30.5	120.0	1.83	1.23	0.597	11	1.25	55.9	0.9	15.3	0.9	1227.516	3.12E-04	5.20E-04	0.052	7.20E-02	8.4928	5.57E-02	0.00
32.0	1.0	31.5	120.0	1.89	1.27	0.613	11	1.25	55.9	0.9	15.1	0.9	1242.641	3.14E-04	5.20E-04	0.052	7.30E-02	8.4928	5.65E-02	0.00
33.0	1.0	32.5	120.0	1.95	1.31	0.629	13	1.25	58.8	0.9	17.6	0.9	1329.436	2.98E-04	3.00E-04	0.030	3.49E-02	8.4928	2.70E-02	0.00
34.0	1.0	33.5	120.0	2.01	1.35	0.645	13	1.25	58.8	0.9	17.4	0.8	1344.735	2.99E-04	3.00E-04	0.030	3.54E-02	8.4928	2.74E-02	0.00
35.0	1.0	34.5	120.0	2.07	1.39	0.660	13	1.25	58.8	0.9	17.2	0.8	1359.713	3.00E-04	5.20E-04	0.052	6.22E-02	8.4928	4.81E-02	0.00
36.0	1.0	35.5	120.0	2.13	1.43	0.675	13	1.25	58.8	0.9	17.0	0.8	1374.387	3.01E-04	5.20E-04	0.052	6.30E-02	8.4928	4.88E-02	0.00
37.0	1.0	36.5	120.0	2.19	1.47	0.690	13	1.25	58.8	0.9	16.9	0.8	1388.771	3.02E-04	5.20E-04	0.052	6.38E-02	8.4928	4.94E-02	0.00
38.0	1.0	37.5	120.0	2.25	1.51	0.704	33	1.25	90.8	0.9	42.4	0.8	1913.714	2.22E-04	3.00E-04	0.030	1.22E-02	8.4928	9.43E-03	0.00
39.0	1.0	38.5	120.0	2.31	1.55	0.718	33	1.25	90.8	0.8	42.0	0.8	1932.598	2.22E-04	3.00E-04	0.030	1.23E-02	8.4928	9.54E-03	0.00
40.0	1.0	39.5	120.0	2.37	1.59	0.732	33	1.25	90.8	0.8	41.6	0.8	1951.139	2.23E-04	3.00E-04	0.030	1.25E-02	8.4928	9.65E-03	0.00
41.0	1.0	40.5	120.0	2.43	1.63	0.745	33	1.25	90.8	0.8	41.2	0.8	1969.350	2.23E-04	3.00E-04	0.030	1.26E-02	8.4928	9.77E-03	0.00
42.0	1.0	41.5	120.0	2.49	1.67	0.758	33	1.25	90.8	0.8	40.8	0.8	1987.246	2.23E-04	3.00E-04	0.030	1.28E-02	8.4928	9.88E-03	0.00
43.0	1.0	42.5	120.0	2.55	1.71	0.771	33	1.25	90.8	0.8	40.4	0.8	2004.839	2.23E-04	3.00E-04	0.030	1.29E-02	8.4928	9.99E-03	0.00
44.0	1.0	43.5	120.0	2.61	1.75	0.783	7	1.25	40.6	0.8	15.5	0.8	1473.568	3.07E-04	5.20E-04	0.052	7.06E-02	8.4928	5.47E-02	0.00
45.0	1.0	44.5	120.0	2.67	1.79	0.795	7	1.25	40.6	0.8	15.4	0.8	1487.981	3.07E-04	5.20E-04	0.052	7.11E-02	8.4928	5.50E-02	0.00
46.0	1.0	45.5	120.0	2.73	1.83	0.807	7	1.25	40.6	0.8	15.3	0.8	1502.208	3.06E-04	5.20E-04	0.052	7.15E-02	8.4928	5.53E-02	0.00
47.0	1.0	46.5	120.0	2.79	1.87	0.819	11	1.25	50.1	0.8	13.0	0.8	1436.934	3.23E-04	5.20E-04	0.052	8.72E-02	8.4928	6.75E-02	0.00
48.0	1.0	47.5	120.0	2.85	1.91	0.830	11	1.25	50.1	0.8	12.9	0.8	1448.200	3.23E-04	5.20E-04	0.052	8.81E-02	8.4928	6.82E-02	0.00
49.0	1.0	48.5	120.0	2.91	1.95	0.841	11	1.25	50.1	0.8	12.8	0.8	1459.300	3.23E-04	5.20E-04	0.052	8.90E-02	8.4928	6.89E-02	0.00
50.0	1.0	49.5	120.0	2.97	1.99	0.851	25	1.25	74.5	0.8	34.0	0.8	2042.085	2.32E-04	3.00E-04	0.030	1.59E-02	8.4928	1.23E-02	0.00

TOTAL SETTLEMENT = **0.05**

Figure 9

Client : Perry Street
File No. : W1301-06-01
Boring : 3

GEOCON

TECHNICAL ENGINEERING AND DESIGN GUIDES AS ADAPTED FROM THE US ARMY CORPS OF ENGINEERS, NO. 9
EVALUATION OF EARTHQUAKE-INDUCED SETTLEMENTS IN DRY SANDY SOILS
MAXIMUM CONSIDERED EARTHQUAKE

MCE EARTHQUAKE INFORMATION:

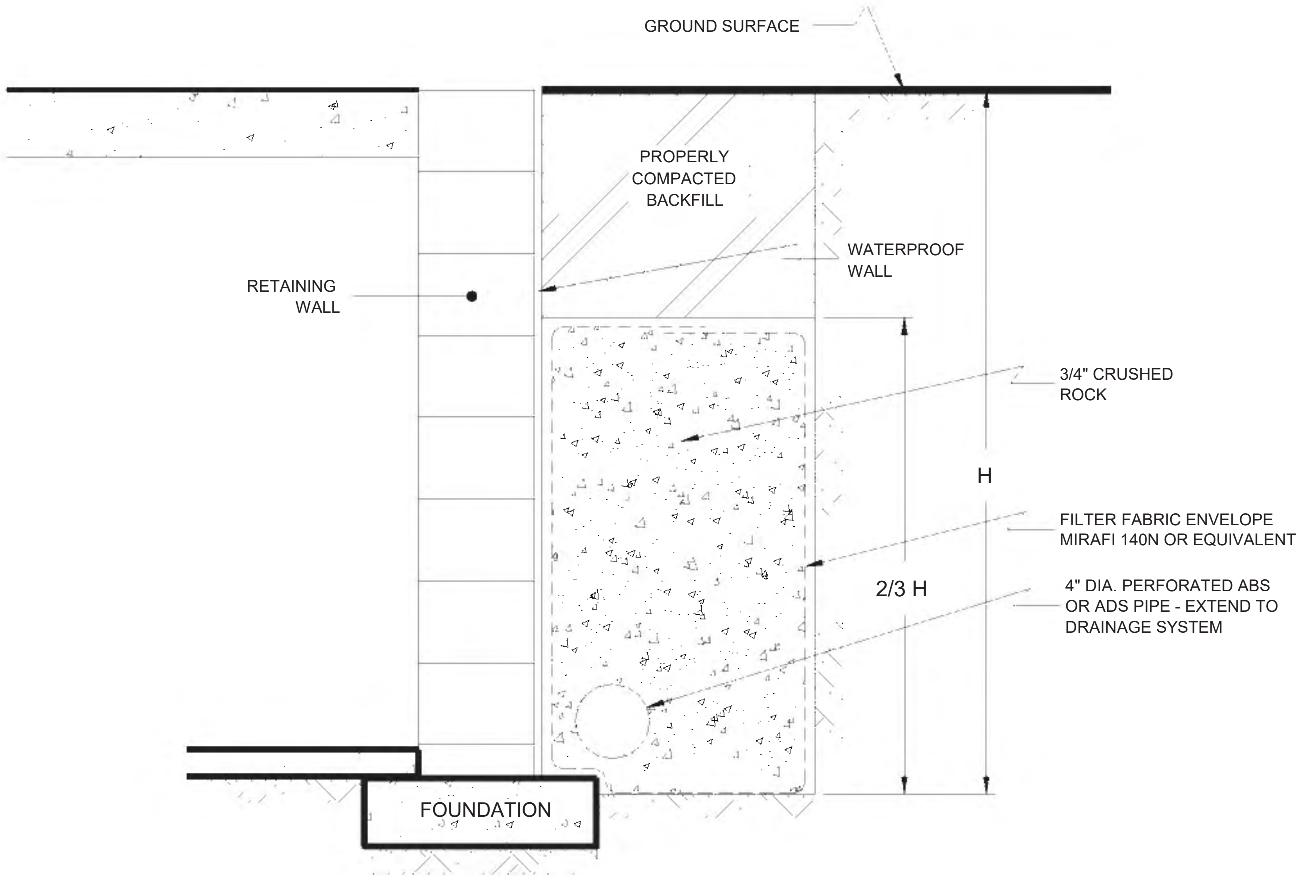
Earthquake Magnitude:	6.87
Peak Horiz. Acceleration (g):	0.823

Fig 4.1 Fig 4.2 Fig 4.4

Depth of Base of Strata (ft)	Thickness of Layer (ft)	Depth of Mid-point of Layer (ft)	Soil Unit Weight (pcf)	Overburden Pressure at Mid-point (tsf)	Mean Effective Pressure at Mid-point (tsf)	Average Cyclic Shear Stress [Tav]	Field SPT [N]	Correction Factor [Cer]	Relative Density [Dr] (%)	Correction Factor [Cn]	Corrected [N1]60	rd Factor	Maximum Shear Mod. [Gmax] (tsf)	[yeff]*[Geff] [Gmax]	yeff Shear Strain	[yeff]*100%	Volumetric Strain M7.5 [E15} (%)	Number of Strain Cycles [Nc]	Corrected Vol. Strains [Ec]	Estimated Settlement [S] (inches)
1.0	1.0	0.5	120.0	0.03	0.02	0.016	10	1.25	76.6	1.7	19.1	1.0	169.475	9.38E-05	1.90E-04	0.019	2.00E-02	9.8538	1.66E-02	0.00
2.0	1.0	1.5	120.0	0.09	0.06	0.048	10	1.25	74.4	1.7	19.1	1.0	293.540	1.59E-04	2.30E-04	0.023	2.43E-02	9.8538	2.01E-02	0.00
3.0	1.0	2.5	120.0	0.15	0.10	0.080	10	1.25	72.5	1.7	19.1	1.0	378.958	2.02E-04	8.10E-04	0.081	8.55E-02	9.8538	7.07E-02	0.02
4.0	1.0	3.5	120.0	0.21	0.14	0.112	10	1.25	70.7	1.7	19.1	1.0	448.389	2.34E-04	8.10E-04	0.081	8.55E-02	9.8538	7.07E-02	0.02
5.0	1.0	4.5	120.0	0.27	0.18	0.144	10	1.25	69.0	1.7	19.1	1.0	508.425	2.60E-04	8.10E-04	0.081	8.55E-02	9.8538	7.07E-02	0.02
6.0	1.0	5.5	120.0	0.33	0.22	0.176	10	1.25	67.4	1.7	19.1	1.0	562.085	2.82E-04	4.50E-04	0.045	4.75E-02	9.8538	3.93E-02	0.01
7.0	1.0	6.5	120.0	0.39	0.26	0.208	10	1.25	65.9	1.6	18.4	1.0	603.301	3.05E-04	1.00E-03	0.100	1.10E-01	9.8538	9.14E-02	0.02
8.0	1.0	7.5	120.0	0.45	0.30	0.239	10	1.25	64.5	1.5	17.1	1.0	632.776	3.29E-04	1.00E-03	0.100	1.20E-01	9.8538	9.96E-02	0.02
9.0	1.0	8.5	120.0	0.51	0.34	0.271	10	1.25	63.3	1.4	16.1	1.0	659.735	3.51E-04	1.00E-03	0.100	1.30E-01	9.8538	1.07E-01	0.03
10.0	1.0	9.5	120.0	0.57	0.38	0.302	7	1.25	52.2	1.4	10.7	1.0	607.907	4.18E-04	2.70E-03	0.270	5.75E-01	9.8538	4.76E-01	0.00
11.0	1.0	10.5	120.0	0.63	0.42	0.333	7	1.25	52.2	1.3	10.1	1.0	628.529	4.39E-04	2.70E-03	0.270	6.10E-01	9.8538	5.05E-01	0.00
12.0	1.0	11.5	120.0	0.69	0.46	0.364	7	1.25	52.2	1.2	9.8	0.9	650.354	4.57E-04	2.70E-03	0.270	6.36E-01	9.8538	5.26E-01	0.00
13.0	1.0	12.5	120.0	0.75	0.50	0.395	7	1.25	52.2	1.2	9.6	0.9	673.332	4.71E-04	1.20E-03	0.120	2.90E-01	9.8538	2.40E-01	0.00
14.0	1.0	13.5	120.0	0.81	0.54	0.426	10	1.25	59.6	1.2	14.4	0.9	802.030	4.19E-04	1.20E-03	0.120	1.77E-01	9.8538	1.47E-01	0.00
15.0	1.0	14.5	120.0	0.87	0.58	0.456	10	1.25	59.6	1.2	14.2	0.9	825.875	4.30E-04	1.20E-03	0.120	1.81E-01	9.8538	1.50E-01	0.00
16.0	1.0	15.5	120.0	0.93	0.62	0.486	10	1.25	59.6	1.1	13.9	0.9	848.608	4.39E-04	1.20E-03	0.120	1.86E-01	9.8538	1.54E-01	0.00
17.0	1.0	16.5	120.0	0.99	0.66	0.516	3	1.25	31.4	1.1	4.5	0.9	603.195	6.47E-04	4.10E-03	0.410	2.42E+00	9.8538	2.01E+00	0.00
18.0	1.0	17.5	120.0	1.05	0.70	0.545	3	1.25	31.4	1.1	4.5	0.9	617.634	6.59E-04	4.10E-03	0.410	2.47E+00	9.8538	2.05E+00	0.00
19.0	1.0	18.5	120.0	1.11	0.74	0.574	3	1.25	31.4	1.1	4.4	0.9	631.508	6.70E-04	4.10E-03	0.410	2.53E+00	9.8538	2.09E+00	0.00
20.0	1.0	19.5	120.0	1.17	0.78	0.603	3	1.25	31.4	1.1	4.3	0.9	644.865	6.80E-04	4.10E-03	0.410	2.57E+00	9.8538	2.13E+00	0.00
21.0	1.0	20.5	120.0	1.23	0.82	0.631	3	1.25	31.4	1.1	4.3	0.9	657.749	6.89E-04	4.10E-03	0.410	2.62E+00	9.8538	2.17E+00	0.00
22.0	1.0	21.5	120.0	1.29	0.86	0.660	3	1.25	31.4	1.0	4.2	0.9	670.198	6.98E-04	4.10E-03	0.410	2.67E+00	9.8538	2.21E+00	0.00
23.0	1.0	22.5	120.0	1.35	0.90	0.687	3	1.25	31.4	1.0	4.1	0.9	682.246	7.05E-04	1.00E-02	1.000	6.63E+00	9.8538	5.49E+00	0.00
24.0	1.0	23.5	120.0	1.41	0.94	0.715	3	1.25	31.4	1.0	4.1	0.9	693.922	7.13E-04	1.00E-02	1.000	6.75E+00	9.8538	5.59E+00	0.00
25.0	1.0	24.5	120.0	1.47	0.98	0.742	3	1.25	31.4	1.0	4.0	0.9	705.252	7.19E-04	1.00E-02	1.000	6.86E+00	9.8538	5.68E+00	0.00
26.0	1.0	25.5	120.0	1.53	1.03	0.769	9	1.25	52.3	1.0	12.7	0.9	1055.741	4.92E-04	8.10E-04	0.081	1.40E-01	9.8538	1.16E-01	0.00
27.0	1.0	26.5	120.0	1.59	1.07	0.795	9	1.25	52.3	1.0	12.5	0.9	1071.522	4.96E-04	8.10E-04	0.081	1.42E-01	9.8538	1.18E-01	0.00
28.0	1.0	27.5	120.0	1.65	1.11	0.821	11	1.25	55.9	1.0	15.8	0.9	1179.921	4.60E-04	8.10E-04	0.081	1.07E-01	9.8538	8.88E-02	0.00
29.0	1.0	28.5	120.0	1.71	1.15	0.846	11	1.25	55.9	0.9	15.6	0.9	1196.177	4.63E-04	8.10E-04	0.081	1.09E-01	9.8538	9.02E-02	0.00
30.0	1.0	29.5	120.0	1.77	1.19	0.871	11	1.25	55.9	0.9	15.4	0.9	1212.035	4.66E-04	8.10E-04	0.081	1.11E-01	9.8538	9.15E-02	0.00
31.0	1.0	30.5	120.0	1.83	1.23	0.896	11	1.25	55.9	0.9	15.3	0.9	1227.516	4.68E-04	8.10E-04	0.081	1.12E-01	9.8538	9.28E-02	0.00
32.0	1.0	31.5	120.0	1.89	1.27	0.920	11	1.25	55.9	0.9	15.1	0.9	1242.641	4.71E-04	8.10E-04	0.081	1.14E-01	9.8538	9.41E-02	0.00
33.0	1.0	32.5	120.0	1.95	1.31	0.943	13	1.25	58.8	0.9	17.6	0.9	1329.436	4.47E-04	8.10E-04	0.081	9.43E-02	9.8538	7.81E-02	0.00
34.0	1.0	33.5	120.0	2.01	1.35	0.967	13	1.25	58.8	0.9	17.4	0.8	1344.735	4.49E-04	8.10E-04	0.081	9.56E-02	9.8538	7.91E-02	0.00
35.0	1.0	34.5	120.0	2.07	1.39	0.990	13	1.25	58.8	0.9	17.2	0.8	1359.713	4.50E-04	8.10E-04	0.081	9.68E-02	9.8538	8.02E-02	0.00
36.0	1.0	35.5	120.0	2.13	1.43	1.012	13	1.25	58.8	0.9	17.0	0.8	1374.387	4.52E-04	8.10E-04	0.081	9.81E-02	9.8538	8.12E-02	0.00
37.0	1.0	36.5	120.0	2.19	1.47	1.034	13	1.25	58.8	0.9	16.9	0.8	1388.771	4.53E-04	8.10E-04	0.081	9.93E-02	9.8538	8.22E-02	0.00
38.0	1.0	37.5	120.0	2.25	1.51	1.055	33	1.25	90.8	0.9	42.4	0.8	1913.714	3.33E-04	5.20E-04	0.052	2.11E-02	9.8538	1.75E-02	0.00
39.0	1.0	38.5	120.0	2.31	1.55	1.076	33	1.25	90.8	0.8	42.0	0.8	1932.598	3.33E-04	5.20E-04	0.052	2.14E-02	9.8538	1.77E-02	0.00
40.0	1.0	39.5	120.0	2.37	1.59	1.097	33	1.25	90.8	0.8	41.6	0.8	1951.139	3.34E-04	5.20E-04	0.052	2.16E-02	9.8538	1.79E-02	0.00
41.0	1.0	40.5	120.0	2.43	1.63	1.117	33	1.25	90.8	0.8	41.2	0.8	1969.350	3.34E-04	5.20E-04	0.052	2.19E-02	9.8538	1.81E-02	0.00
42.0	1.0	41.5	120.0	2.49	1.67	1.136	33	1.25	90.8	0.8	40.8	0.8	1987.246	3.35E-04	5.20E-04	0.052	2.21E-02	9.8538	1.83E-02	0.00
43.0	1.0	42.5	120.0	2.55	1.71	1.155	33	1.25	90.8	0.8	40.4	0.8	2004.839	3.35E-04	5.20E-04	0.052	2.24E-02	9.8538	1.85E-02	0.00
44.0	1.0	43.5	120.0	2.61	1.75	1.174	7	1.25	40.6	0.8	15.5	0.8	1473.568	4.60E-04	8.10E-04	0.081	1.10E-01	9.8538	9.11E-02	0.00
45.0	1.0	44.5	120.0	2.67	1.79	1.192	7	1.25	40.6	0.8	15.4	0.8	1487.981	4.60E-04	8.10E-04	0.081	1.11E-01	9.8538	9.16E-02	0.00
46.0	1.0	45.5	120.0	2.73	1.83	1.210	7	1.25	40.6	0.8	15.3	0.8	1502.208	4.59E-04	8.10E-04	0.081	1.11E-01	9.8538	9.22E-02	0.00
47.0	1.0	46.5	120.0	2.79	1.87	1.227	11	1.25	50.1	0.8	13.0	0.8	1436.934	4.84E-04	8.10E-04	0.081	1.36E-01	9.8538	1.12E-01	0.00
48.0	1.0	47.5	120.0	2.85	1.91	1.244	11	1.25	50.1	0.8	12.9	0.8	1448.200	4.84E-04	8.10E-04	0.081	1.37E-01	9.8538	1.14E-01	0.00
49.0	1.0	48.5	120.0	2.91	1.95	1.260	11	1.25	50.1	0.8	12.8	0.8	1459.300	4.84E-04	8.10E-04	0.081	1.39E-01	9.8538	1.15E-01	0.00
50.0	1.0	49.5	120.0	2.97	1.99	1.276	25	1.25	74.5	0.8	34.0	0.8	2042.085	3.48E-04	5.20E-04	0.052	2.75E-02	9.8538	2.28E-02	0.00

TOTAL SETTLEMENT = **0.14**

Figure 10



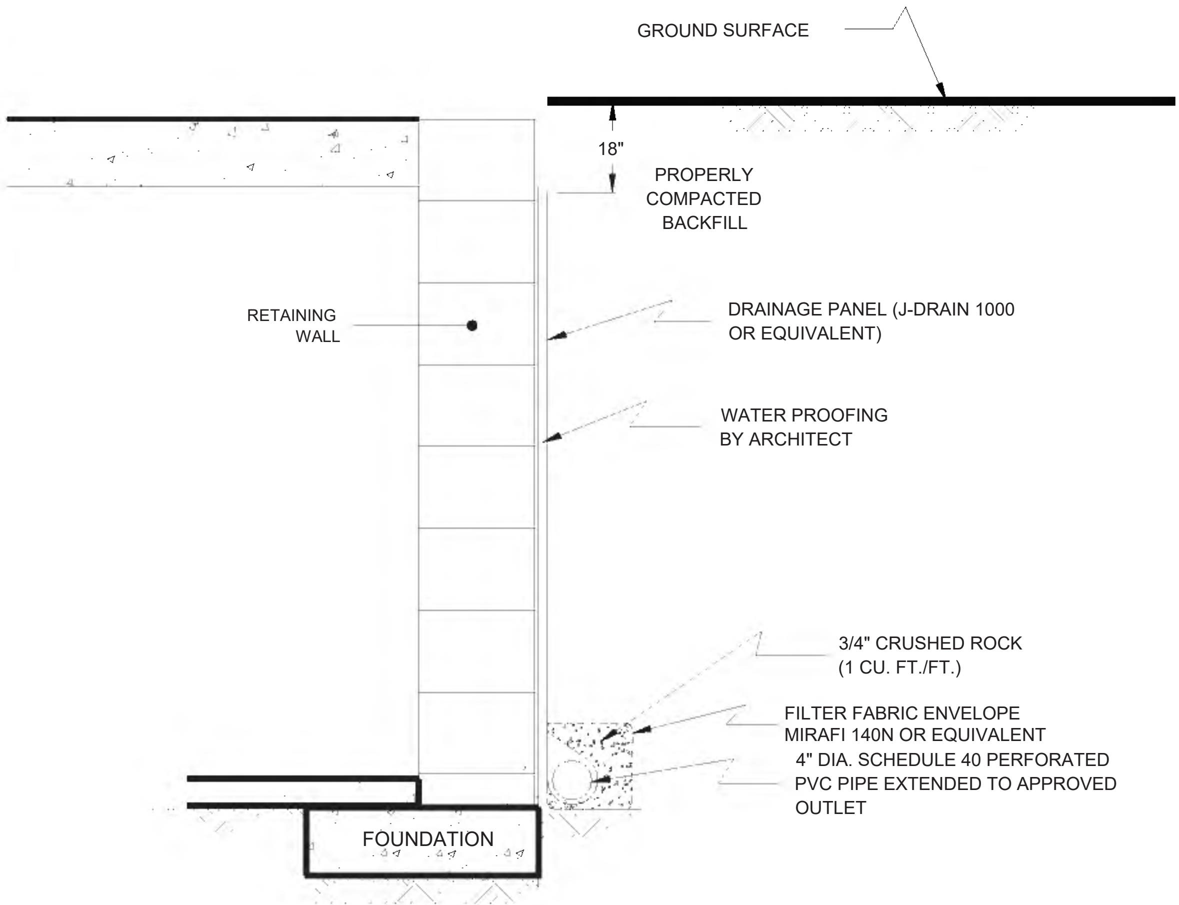
NO SCALE

GEOCON WEST, INC.
ENVIRONMENTAL GEOTECHNICAL MATERIALS
3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA 91504
PHONE (818) 841-8388 - FAX (818) 841-1704

RETAINING WALL DRAIN DETAIL

21611 SOUTH PERRY STREET
CARSON, CALIFORNIA

DRAFTED BY: JMH	CHECKED BY: JTA	APRIL 2021	NO. W1301-06-01	FIG. 10



NO SCALE

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RETAINING WALL DRAIN DETAIL

21611 SOUTH PERRY STREET
CARSON, CALIFORNIA

APRIL 2021 | NO. W1301-06-01 | FIG. 11

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

The site was explored on February 9, 2021 by drilling five 8-inch diameter borings using a truck-mounted hollow-stem auger drilling machine and advancing five cone penetrometer tests (CPTs). The borings were excavated to depths between approximately 20½ and 51 feet beneath the existing ground surface. The CPTs were advanced to depths of approximately 60 feet below existing ground surface. Representative and relatively undisturbed samples were obtained by driving a 4 inch, O. D., California Modified Sampler into the "undisturbed" soil mass with blows from a 140 pound hammer falling 30 inches. Bulk samples were also obtained. Standard Penetration Tests were performed in boring B3.

The soil conditions encountered in the borings were visually examined, classified and logged in general accordance with the Unified Soil Classification System (USCS). Logs of the borings are presented on Figures A1 through A5. The CPT data is presented as Figures A6 through A10. The logs depict the soil and geologic conditions encountered and the depth at which samples were obtained. The logs also include our interpretation of the conditions between sampling intervals. Therefore, the logs contain both observed and interpreted data. We determined the lines designating the interface between soil materials on the logs using visual observations, penetration rates, excavation characteristics and other factors. The transition between materials may be abrupt or gradual. Where applicable, the boring logs were revised based on subsequent laboratory testing. The approximate locations of the borings and CPTs are depicted on the Site Plan (see Figure 2)

BORING 1

$#$1' Ā2 Ä#'4 -- -)$Ā>&! "# $)$- 2/9/2021

$< 3/"! $%) HOLLOW STEM AUGER +;= JMH

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5	BULK 0-5'				**ARTIFICIAL FILL** Silty Sand, poorly graded, dense, moist, light brown, fine-grained, some medium-grained, some gravel.			
6								
7								
	B1@5'				**ALLUVIUM** Clay, firm, moist, dark gray, high plasticity.	19	105.0	24.0
8								
9	B1@7.5'				- some sand	13	106.1	19.7
:5	B1@10'			CH	- olive brown mottles	21	103.7	22.0
:6			▼					
:7					Clayey Sand, poorly graded, loose, saturated, brown, fine-grained.			
:8	B1@15'			SC		10	111.6	19.8
:9					Silty Sand, poorly graded, medium dense, saturated, brown, fine-grained.			
65	B1@20'			SM		22	114.5	19.2

Total depth of boring: 20.5 feet
Fill to 4.5 feet.
Groundwater encountered at 12.5 feet.
Backfilled with grout.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.
NOTE: The stratification lines presented herein represent the approximate boundary between earth types; the transitions may be gradual.

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Figure A1,
Log of Boring 1, Page 1 of 1

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%&) $=) .$Ā#& , Ā&0ĀÄ3+Ä 3*0 >$Ā>&%-/) /&%ĀÄĀ& (%Ā.$*$ &%Ā "" #/$ĀÄ&%#; Ā) Ā).$ĀÄ " $>/0/>Ā+&*/ %, Ā&Ā) *$%>. Ā#&) /&%Ā %-Ā) Ā).$Ā-) $Ā%-/>) $- '
/) ĀÄĀ%&.Ā(** %) $-Ā) &Ā<$Ā*$" *$Ä $%)) /1$ĀÄ0ĀÄ3+Ä 3*0 >$Ā>&%-/) /&%ĀÄ) Ā&) .$*Ā#& >) /&%ĀÄ %-Ā)/!$ Ä'

GEOCON

"'*&E $>)Ā%&' (: C5:D58D5:

BORING 2

$#$1' Ā2 Ä#'4 -- -)$Ā>&! "# $)$- 2/9/2021

$< 3/"! $%) HOLLOW STEM AUGER +;= JMH

-$"). /% 0$$)	Ä! "#$ %&'	#/).&# &, ;	,*&3%- ( )$*	Ä&/# >#Ä Ä 23Ä>Ä4	!)$*/ #Ā-$Ä> */ ")/ &%	"$%$)*)/&% *$Ä/Ä)% >$ 2+#&(Ā0)B4	-*; Ā-$%Ä) ; 2" >'0'4	! &/Ä) 3*$ >& %)$%) Ā2 4
5	BULK 0-5'				**ARTIFICIAL FILL** Silty Sand, poorly graded, loose, moist, brown, fine-grained.			
6								
7	B2@3'			ML	**ALLUVIUM** Sandy Silt, firm, moist, dark gray.	14	73.4	29.6
8	B2@6'			CH	Clay, soft, wet, gray, high plasticity.	10	29.3	32.0
9	B2@9'				- firm, dark gray	15	73.9	49.8
:5								
:6	B2@12'					15	87.2	35.9
:7	B2@15'				- soft	8	75.1	45.2
:8								
:9								
65	B2@20'				- firm	17	101.7	27.4

Total depth of boring: 20.5 feet
Fill to 3 feet.
No groundwater encountered.
Backfilled with grout.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.
NOTE: The stratification lines presented herein represent the approximate boundary between earth types; the transitions may be gradual.

Ā(:C5:D58D5:Ā+&*/ %, Ā#& Ä', " E

Figure A2,
Log of Boring 2, Page 1 of 1

Ä! "#$ĀÄ; ! +&#Ä

- "'ĀÄ ! " #/%, Ā3%Ā3>>$Ā Ä03#
- "'ĀÄ) %- *-Ā"$ %$)*) /&%Ā$Ä)
- "'Ā-*/ 1$ĀÄ !" #$Ā3%- /Ä) 3* +$-4
- "'Ā-/Ä) 3* +$-Ā&*Ā+ , ĀÄ !" #$
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5	BULK 0-5'				**ARTIFICIAL FILL** Sand, poorly graded, dense, moist, light brown, fine-grained, some medium-grained.			
6	B3@1.5'					50 (6")	107.1	4.0
7								
8	B3@5'					50 (6")		
9	B3@7'				- grayish brown, some fine gravel	50 (3")	103.4	8.7
:5	B3@10'			MH	**ALLUVIUM** Silt, soft, moist, dark gray, high plasticity, some sand.	7		
:6	B3@12.5'			CH	Clay, firm, moist, dark gray, high plasticity.	21	91.7	31.6
:7								
:8	B3@15'					10		
:9	B3@17.5'		▼	CL	Clay, firm, moist, dark gray.	14	103.7	26.1
65	B3@20'				- soft, wet	3		
66	B3@22.5'				- firm, light brown	11	105.7	27.3
67								
68	B3@25'			CH	Clay, firm, moist, olive brown, some sand, trace gravel, high plasticity.	9		
69	B3@27.5'				- mottled calcium deposits, increase in sand	21	89.9	32.6

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Figure A3,
Log of Boring 3, Page 1 of 2

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C5	B3@30'			CH	- decrease in sand	11		
C6	B3@32.5'				- stiff	22	98.4	27.3
C7	B3@35'				- firm, increase in sand	13		
C8								
C9	B3@37.5'			SM	Silty Sand, poorly graded, dense, wet, olive brown, fine-grained.	67	117.6	16.4
75	B3@40'					33		
76	B3@42.5'				- medium dense, trace shells	36	101.9	25.0
77	B3@45'			CL	Sandy Clay, soft, wet, olive brown.	7		
78	B3@47.5'			SC	Clayey Sand, poorly graded, medium dense, saturated, olive brown with oxidation mottles, fine-grained.	20	100.0	25.4
79								
F5	B3@50'			SM	Silty Sand, poorly graded, medium dense, saturated, olive brown.	25		

Total depth of boring: 51 feet
Fill to 9 feet.
Groundwater encountered at 17.6 feet.
Backfilled with grout.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.
NOTE: The stratification lines presented herein represent the approximate boundary between earth types; the transitions may be gradual.

Figure A3,
Log of Boring 3, Page 2 of 2

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5	BULK 0-5'				**ARTIFICIAL FILL** Silty Sand, poorly graded, dense, moist, brown, fine-grained, some medium-grained, some gravel.			
6								
7	B4@3'					50 (6")		
8	B4@5'			ML	**ALLUVIUM** Sandy Silt, soft, moist, dark gray.	10	78.1	31.1
				CH	Clay, soft, wet, dark gray, high plasticity.			
9	B4@7.5'					10	80.7	38.9
:5	B4@10'					8	77.8	42.4
:6								
:7								
:8	B4@15'					10	85.0	38.5
:9								
65	B4@20'					4	80.0	42.3

Total depth of boring: 20.5 feet
Fill to 5 feet.
No groundwater encountered.
Backfilled with grout.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.
NOTE: The stratification lines presented herein represent the approximate boundary between earth types; the transitions may be gradual.

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Figure A4,
Log of Boring 4, Page 1 of 1

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5					**ARTIFICIAL FILL** Silty Sand, poorly graded, loose, moist, brown, fine-grained, some medium-grained.			
6								
7								
	B5@5'				**ALLUVIUM** Clay, soft, moist, dark gray, high plasticity.	11	79.5	42.3
8								
9	B5@7.5'				- wet	10	82.2	38.4
:5	B5@10'					7	74.1	37.5
				CH				
:6								
:7								
	B5@15'				- saturated	11	97.9	47.5
:8								
:9								
65	B5@20'				- firm, no recovery	17		

Total depth of boring: 20.5 feet
Fill to 5 feet.
No groundwater encountered.
Backfilled with grout.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.
NOTE: The stratification lines presented herein represent the approx

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Figure A5,
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GEOCON

Shear-Induced Building Settlement (Ds) calculation procedure

The shear-induced building settlement (Ds) due to liquefaction below the building can be estimated using the relationship developed by Bray and Macedo (2017):

$$Ln(Ds) = c1 + c2 * LBS + 0.58 * Ln\left(Tanh\left(\frac{HL}{6}\right)\right) +$$
$$4.59 * Ln(Q) - 0.42 * Ln(Q)^2 - 0.02 * B +$$
$$0.84 * Ln(CAVdp) + 0.41 * Ln(Sa1) + \varepsilon$$

where Ds is in the units of mm, c1= -8.35 and c2= 0.072 for LBS ≤ 16, and c1= -7.48 and c2= 0.014 otherwise. Q is the building contact pressure in units of kPa, HL is the cumulative thickness of the liquefiable layers in the units of m, B is the building width in the units of m, CAVdp is a standardized version of the cumulative absolute velocity in the units of g-s, Sa1 is 5%-damped pseudo-acceleration response spectral value at a period of 1 s in the units of g, and ε is a normal random variable with zero mean and 0.50 standard deviation in Ln units. The liquefaction-induced building settlement index (LBS) is:

$$LBS = \sum W * \frac{\varepsilon_{shear}}{z}\, dz$$

where z (m) is the depth measured from the ground surface > 0, W is a foundation-weighting factor wherein W = 0.0 for z less than Df, which is the embedment depth of the foundation, and W = 1.0 otherwise. The shear strain parameter (ε_shear) is the liquefaction-induced free-field shear strain (in %) estimated using Zhang et al. (2004). It is calculated based on the estimated Dr of the liquefied soil layer and the calculated safety factor against liquefaction triggering (FSL).

References

- Lunne, T., Robertson, P.K., and Powell, J.J.M 1997. Cone penetration testing in geotechnical practice, E & FN Spon Routledge, 352 p, ISBN 0-7514-0393-8.

- Boulanger, R.W. and Idriss, I. M., 2007. Evaluation of Cyclic Softening in Silts and Clays. ASCE Journal of Geotechnical and Geoenvironmental Engineering June, Vol. 133, No. 6 pp 641-652

- Boulanger, R.W. and Idriss, I. M., 2014. CPT AND SPT BASED LIQUEFACTION TRIGGERING PROCEDURES. DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING COLLEGE OF ENGINEERING UNIVERSITY OF CALIFORNIA AT DAVIS

- Robertson, P.K. and Cabal, K.L., 2007, Guide to Cone Penetration Testing for Geotechnical Engineering. Available at no cost at http://www.geologismiki.gr/

- Robertson, P.K. 1990. Soil classification using the cone penetration test. Canadian Geotechnical Journal, 27 (1), 151-8.

- Robertson, P.K. and Wride, C.E., 1998. Cyclic Liquefaction and its Evaluation based on the CPT Canadian Geotechnical Journal, 1998, Vol. 35, August.

- Youd, T.L., Idriss, I.M., Andrus, R.D., Arango, I., Castro, G., Christian, J.T., Dobry, R., Finn, W.D.L., Harder, L.F., Hynes, M.E., Ishihara, K., Koester, J., Liao, S., Marcuson III, W.F., Martin, G.R., Mitchell, J.K., Moriwaki, Y., Power, M.S., Robertson, P.K., Seed, R., and Stokoe, K.H., Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshop on Evaluation of Liquefaction Resistance of Soils, ASCE, Journal of Geotechnical & Geoenvironmental Engineering, Vol. 127, October, pp 817-833

- Zhang, G., Robertson. P.K., Brachman, R., 2002, Estimating Liquefaction Induced Ground Settlements from the CPT, Canadian Geotechnical Journal, 39: pp 1168-1180

- Zhang, G., Robertson. P.K., Brachman, R., 2004, Estimating Liquefaction Induced Lateral Displacements using the SPT and CPT, ASCE, Journal of Geotechnical & Geoenvironmental Engineering, Vol. 130, No. 8, 861-871

- Pradel, D., 1998, Procedure to Evaluate Earthquake-Induced Settlements in Dry Sandy Soils, ASCE, Journal of Geotechnical & Geoenvironmental Engineering, Vol. 124, No. 4, 364-368

- Iwasaki, T., 1986, Soil liquefaction studies in Japan: state-of-the-art, Soil Dynamics and Earthquake Engineering, Vol. 5, No. 1, 2-70

- Papathanassiou G., 2008, LPI-based approach for calibrating the severity of liquefaction-induced failures and for assessing the probability of liquefaction surface evidence, Eng. Geol. 96:94–104

- P.K. Robertson, 2009, Interpretation of Cone Penetration Tests - a unified approach., Canadian Geotechnical Journal, Vol. 46, No. 11, pp 1337-1355

- P.K. Robertson, 2009. “Performance based earthquake design using the CPT”, Keynote Lecture, International Conference on Performance-based Design in Earthquake Geotechnical Engineering - from case history to practice, IS-Tokyo, June 2009
- Robertson, P.K. and Lisheng, S., 2010, “Estimation of seismic compression in dry soils using the CPT” FIFTH INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN GEOTECHNICAL EARTHQUAKE ENGINEERING AND SOIL DYNAMICS, *Symposium in honor of professor I. M. Idriss,* SAN diego, CA

- R. E. S. Moss, R. B. Seed, R. E. Kayen, J. P. Stewart, A. Der Kiureghian, K. O. Cetin, CPT-Based Probabilistic and Deterministic Assessment of In Situ Seismic Soil Liquefaction Potential, Journal of Geotechnical and Geoenvironmental Engineering, Vol. 132, No. 8, August 1, 2006

- I. M. Idriss and R. W. Boulanger, 2008. Soil liquefaction during earthquakes, Earthquake Engineering Research Institute MNO-12

- Jonathan D. Bray & Jorge Macedo, Department of Civil & Environmental Engineering, Univ. of California, Berkeley, CA, USA, Simplified procedure for estimating liquefaction-induced building settlement, *Proceedings of the 19th International Conference on Soil Mechanics and Geotechnical Engineering, Seoul 201*

Attachment C

City Forms

Attachment D

Master Covenant Agreement (MCA)

MCA will be provided in ministerial Review

Attachment E

Operations and Maintenance (O&M) Plan

Carson Self-Storage

21611 South Perry St., Carson, Ca 90745

Grading Plan Permit No.: Tbd

Apn: 7327-010-014

REQUIRED PERMITS

This section must list any permits required for the implementation, operation, and maintenance of the BMPs. Possible examples are:

- Permits for connection to sanitary sewer
- Permits from California Department of Fish and Game
- Encroachment permits

If no permits are required, a statement to that effect should be made.

RECORDKEEPING

All records must be made available for review upon request.

RESPONSIBLE PARTY

The owner is aware of the maintenance responsibilities of the proposed BMPs. A funding mechanism is in place to maintain the BMPs at the frequency stated in the LID Plan. The contact information for the entity responsible is below:

Name:	
Company:	Faring Capital, LLC
Title:	
Address 1:	
Address 2:	
Phone Number:	
Email:	

BMP Name	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			
Education for Property Owners, Tenants and Occupants	**Practical informational materials will be provided to employees on general good housekeeping practices that contribute to protection of storm water quality. 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 specified wastes via hosing or other direct discharge to gutters, catch basins and storm drains. Faring Capital, LLC will provide these materials through an education program. This program must be maintained, enforced, and updated periodically by Faring Capital, LLC. Educational materials including, but not limited to, the materials included in Section VII of this plan will be made available to the employees, members and occupants periodically thereafter**	**On-going**	**Owner**
Activity Restriction	**Activities on this site will be limited to activities related to the transfer of solid waste.**	**On-going**	**Owner**

BMP Name	BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Common Area Landscape Management	**Management programs will be designed and established by Faring Capital, LLC who will maintain the common areas within the project site. These programs will include how to mitigate the potential dangers of fertilizer and pesticide usage (refer to the Maintenance and Frequency Table). Ongoing maintenance will be consistent with the State of California Model Water-Efficient Landscape Ordinance.**	**On-going**	**Owner**
Common Area Litter Control	**Faring Capital, LLC will be required to implement waste management and litter control procedures in the common areas aimed at reducing pollution of surface runoff. Faring Capital, LLC may also contract with their landscape maintenance firm to provide this service during regularly scheduled maintenance, which should consist of litter patrol, to prevent emptying of waste receptacles in common areas, and noting waste disposal violations and reporting the violations to Faring Capital, LLC for investigation**	**Inspected on a monthly basis**	**Owner**

BMP Name	BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Common Area Catch Basin Inspection	**Faring Capital, LLC will be required to have at least 80 percent of the catch basins and inlets inspected, cleaned and maintained on an annual basis and 100 percent of the basins and inlets included in a two-year period. Cleaning should take place in the late summer/early fall prior to the start of the rainy season**	**Prior to August 31 each year and weekly during rainy season or within 24 hours prior to rain forecasts.**	**Owner**
Street Sweeping Private Streets and Parking Lots	**Faring Capital, LLC shall have parking lots swept prior to the storm season, in late summer and early fall, prior to the start of the rainy season, as defined by the City of Carson**	**Prior to the storm season, in late summer and early fall, prior to the start of the rainy season**	**Owner**
Structural Source Control BMPs			
Provide Storm Drain System Stenciling and Signage	**All proposed catch basins and inlets will have either a stencil and/or placard with verbiage conforming to City of Carson requirements. Faring Capital, LLC will maintain the stenciling and labels.**	**Semi-annually, Prior to August 31 each year & monthly during rainy season. Repaint stenciling and/or replace signs Prior to August 31**	**Owner**
Design and Construct Trash and Waste Storage Areas to Reduce Pollutant Introduction	**The proposed Waste Management Areas will be within the building footprint**	**Inspected on a monthly basis**	**Owner**

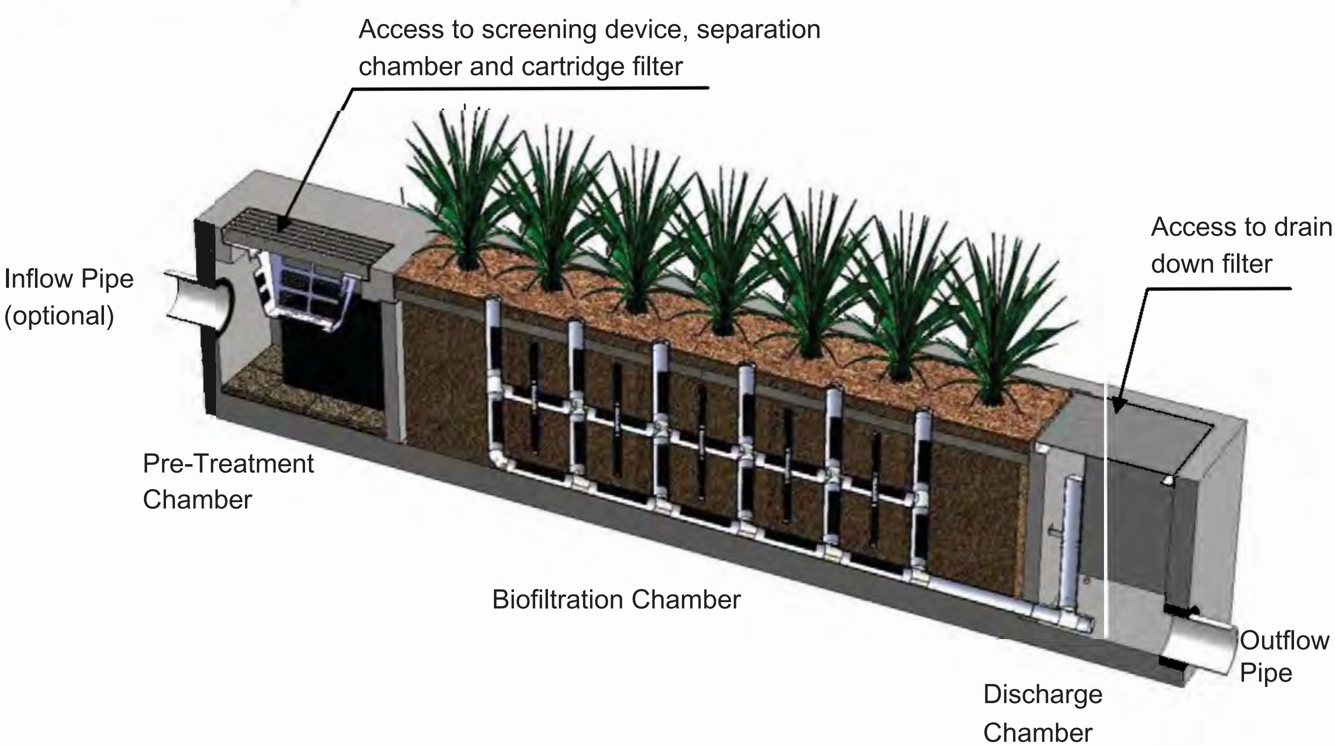
BMP Name	BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Use Efficient Irrigation Systems & Landscape Design	**Design of an effective irrigation system will reduce the amount of runoff from excess irrigation water into the storm drain system. The system design will incorporate the use of a centralized evapotranspiration-based irrigation controllers, rain shutdown devices, master valves, and low precipitation spray heads. The system will have the ability to run multiple programs with cycle and soak to prevent run-off, and emergency shut-off devices for excessive flow conditions to minimize water waste. The design will comply with the State Ordinance AB325 and City of Carson requirements for water conservation**	**Prior to August 31 each year and once during the rainy season (Prior to August 31st)**	**Owner**
	Treatment Control BMPs		
10'20' Modular Wetland System	**Modular Wetland System – Linear Maintenance:** - **Removed trash from screening device.** - **Removed sediment from separation chamber.** - **Replace cartridge filter media.** - **Replace drain down filter media.** - **Trim vegetation.**	**As needed**	**Owner**

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.

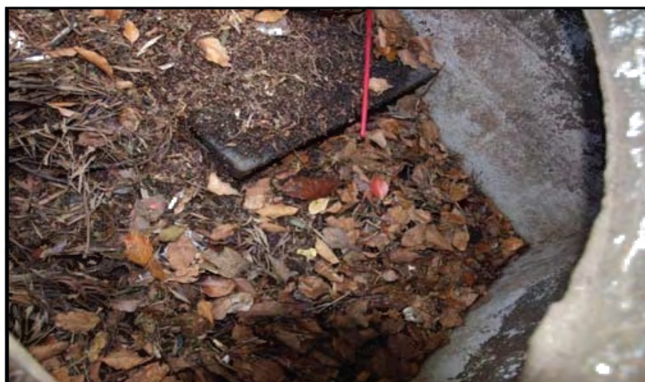
Maintenance Procedure Illustration

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

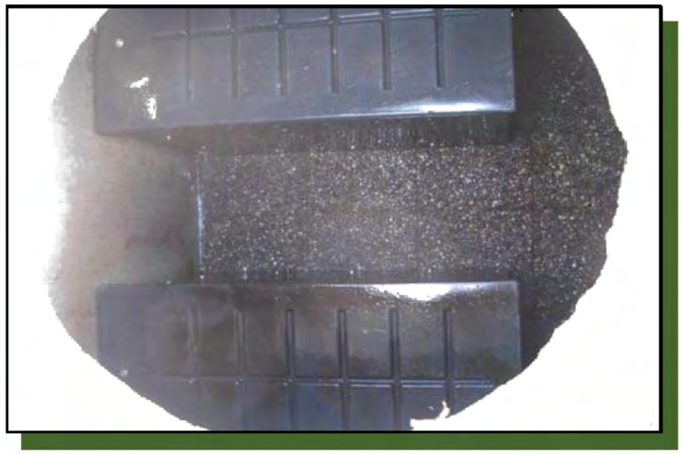
The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.



MODULAR WETLANDS

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

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm

Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition

Additional Notes

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:

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

BIO CLEAN ENVIRONMENTAL SERVICES, INC.

MODULAR WETLANDS

For Office Use Only
(Reviewed By)
(Date) Office personnel to complete section to the left.

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 ______________________________

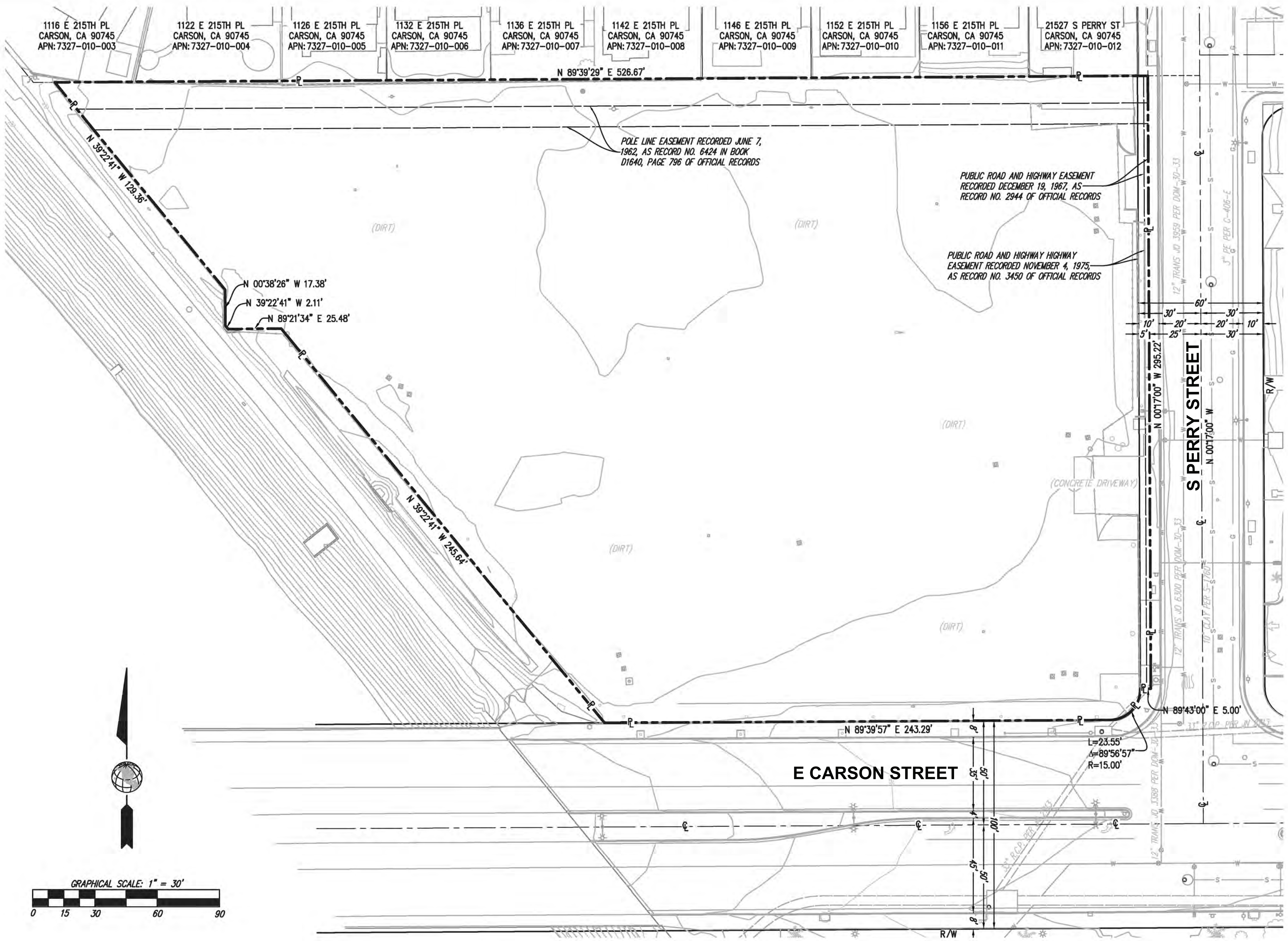
Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

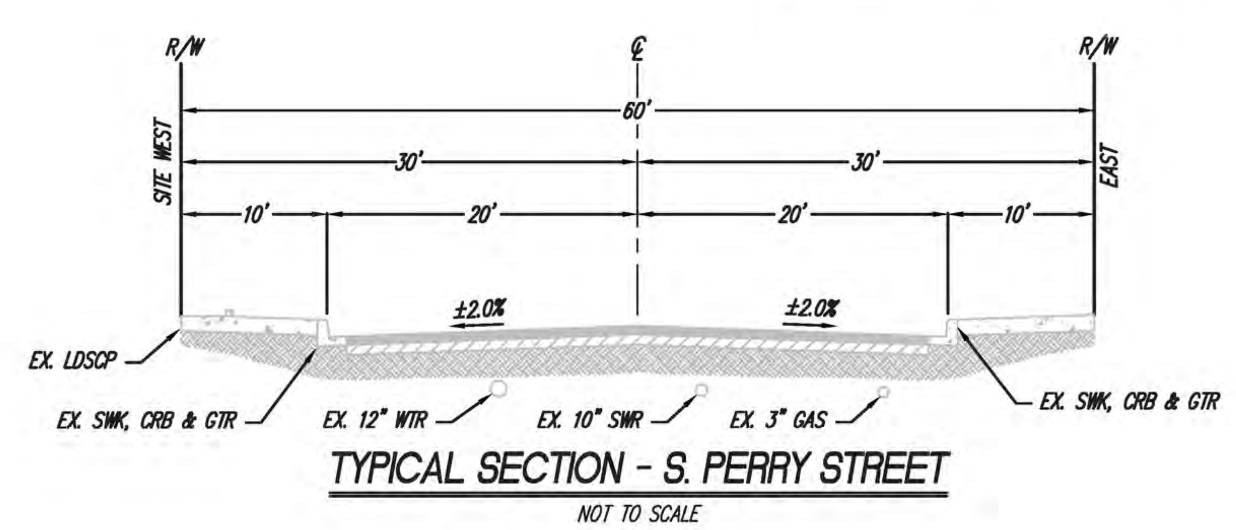
Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

Attachment F

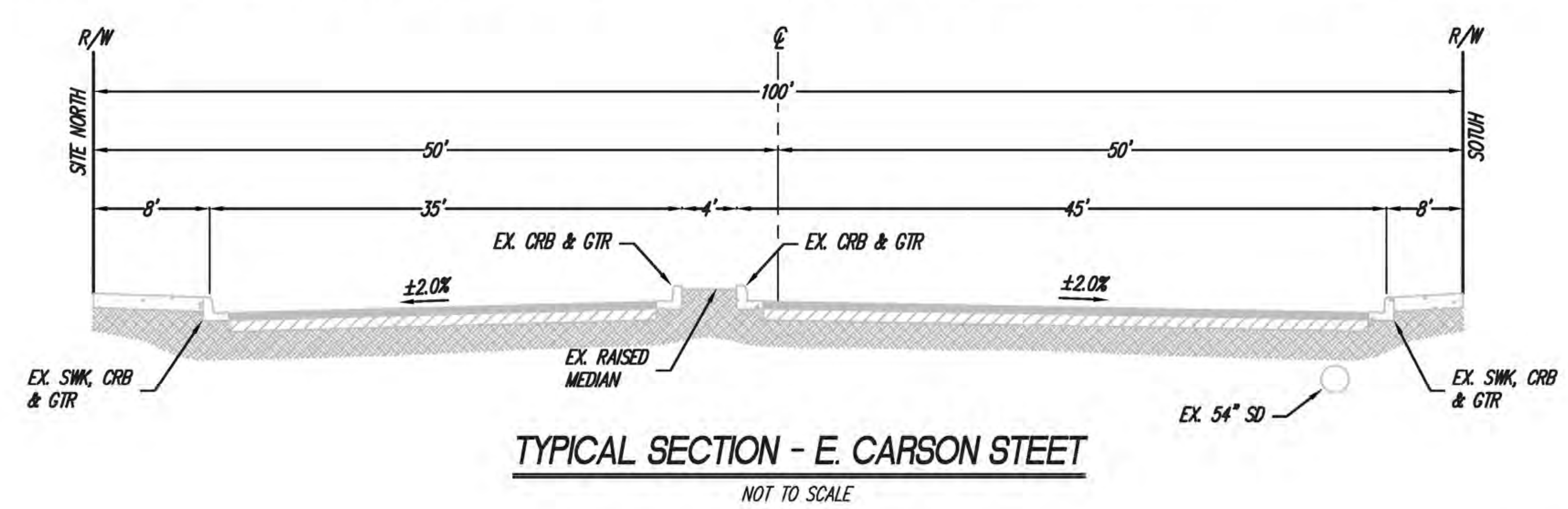
Plans





TYPICAL SECTION - S. PERRY STREET

NOT TO SCALE



TYPICAL SECTION - E. CARSON STEET

NOT TO SCALE

EXISTING LEGEND:

ITEM	SYMBOL
PROPERTY LINE	
CENTERLINE	
RIGHT-OF-WAY	
EASEMENT	
EX. CONTOUR	552
EX. CURB & GUTTER	

OWNER:

RECREATION ROAD LLC

SITE ADDRESS:

21611 SOUTH PERRY STREET
CARSON, CA 90745

ASSESSOR'S PARCEL NUMBER:

7327-010-014 & 7327-010-015

TITLE INFORMATION:

TITLE INFORMATION FOR THIS SURVEY BASED ON A PRELIMINARY REPORT PREPARED BY COMMONWEALTH LAND TITLE INSURANCE COMPANY AS ORDER NO. 09174014-917-EGL, DATED: AUGUST 4, 2020.

LEGAL DESCRIPTION:

THAT PORTION OF LOT 15 OF TRACT NO. 4054, IN THE CITY OF CARSON, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 44, PAGES 39 THROUGH 41 INCLUSIVE OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE NORTHERLY LINE OF THE SOUTHERLY 20 FEET OF SAID LOT WITH A LINE PARALLEL WITH AND NORTHEASTERLY 27 FEET, MEASURED AT RIGHT ANGLES, FROM THE SOUTHWESTERLY LINE OF SAID LOT; THENCE ALONG SAID PARALLEL LINE NORTH 39°21'48" WEST 245.64 FEET; THENCE SOUTH 89°22'27" WEST 25.48 FEET; THENCE NORTH 39°21'48" WEST 2.11 FEET; THENCE NORTH 00°37'33" WEST 17.38 FEET TO A LINE PARALLEL WITH AND NORTHEASTERLY 18 FEET, MEASURED AT RIGHT ANGLES, FROM SAID SOUTHWESTERLY LINE; THENCE ALONG SAID LAST MENTIONED PARALLEL LINE NORTH 39°21'48" WEST TO THE SOUTHERLY LINE OF TRACT NO. 29360, AS PER MAP RECORDED IN BOOK 734, PAGES 45 AND 46 OF MAPS; THENCE EASTERLY ALONG SAID SOUTHERLY LINE TO THE EASTERLY LINE OF SAID LOT 15; THENCE SOUTHERLY ALONG SAID EASTERLY LINE TO SAID NORTHERLY LINE; THENCE WESTERLY ALONG SAID NORTHERLY LINE TO THE POINT OF BEGINNING.

EXCEPT THEREFROM THAT PORTION OF SAID LAND DESIGNATED AS PARCELS 2-36 INCLUSIVE IN THE FINAL DECREE OF CONDEMNATION ENTERED IN SUPERIOR COURT, LOS ANGELES COUNTY, CASE NO. 909,461, A CERTIFIED COPY OF WHICH WAS RECORDED AUGUST 26, 1969 AS INSTRUMENT NO. 2734, IN BOOK D-4478, PAGE 350 OF OFFICIAL RECORDS OF SAID COUNTY AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE EASTERLY LINE OF SAID LOT WITH THE NORTHERLY LINE OF THE SOUTHERLY 20 FEET OF SAID LOT; THENCE WESTERLY ALONG SAID NORTHERLY LINE 19.99 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE NORTHWEST, HAVING A RADIUS OF 15 FEET, TANGENT TO SAID NORTHERLY LINE AND TANGENT TO THE WESTERLY LINE OF THE EASTERLY 5 FEET OF SAID LOT; THENCE NORTHEASTERLY ALONG SAID CURVE 23.55 FEET TO SAID WESTERLY LINE; THENCE EASTERLY AT RIGHT ANGLES FROM SAID WESTERLY LINE 5 FEET TO SAID EASTERLY LINE; THENCE SOUTHERLY ALONG SAID EASTERLY LINE 14.99 FEET TO THE POINT OF BEGINNING.

PLAN PREPARED BY:

OMEGA ENGINEERING CONSULTANTS
4340 VIEWRIDGE AVE. SUITE B
SAN DIEGO, CA 92123
PH:(858) 634-8620 FAX:(858)-634-8627

VERTICAL BENCHMARK:

DESCRIPTION: LOS ANGELES COUNTY PUBLIC WORKS BENCHMARK NUMBER "Y 10545" IN TOP OF CURB ON SOUTH SIDE OF E 213TH STREET APPROXIMATELY 40 FEET WEST OF THE CENTERLINE OF PERRY STREET (APPROXIMATELY 1,010' NORTH OF SITE)

ELEVATION: 18.248' (NAVD88)

SOURCE OF TOPOGRAPHY:

TOPOGRAPHY SHOWN HEREON IS BASED ON AERIAL PHOTOGRAMMETRIC MAPPING CONDUCTED BY PRECISION UAV. HORIZONTAL AND VERTICAL GROUND CONTROL WERE ESTABLISHED BY OMEGA LAND SURVEYING, INC. ON FEBRUARY 01, 2021 WITH SUPPLEMENTAL DATA COLLECTED ON FEBRUARY 03, 2021.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CENTERLINE OF PERRY STREET AS SHOWN ON SUBDIVISION MAP FOR TRACT NO. 29360 FILED IN BOOK 734, PAGE 46-47, OF MAP RECORDS, SAID BEARING BEING "N 00°17" W".

AREA SUMMARY:

TOTAL PARCEL AREA (NET)	110,643	SF
TOTAL PARCEL AREA (GROSS)	112,119	SF

GRADING INFORMATION:

CUT (TO FINISH SURFACE)	357	CY
FILL (TO FINISH SURFACE)	4,199	CY
UNDERCUTS	4,281	CY
REMEDIAL GRADING	15,037	CY
EXPORT (IMBALANCE)	725	CY

EASEMENTS:

4 POLE LINE EASEMENT RECORDED JUNE 7, 1962, AS RECORD NO. 6424 IN BOOK D1640, PAGE 796 OF OFFICIAL RECORDS.

5 PUBLIC ROAD AND HIGHWAY EASEMENT RECORDED DECEMBER 19, 1967, AS RECORD NO. 2944 OF OFFICIAL RECORDS.

7 PUBLIC STREET OR HIGHWAY EASEMENT RECORDED NOVEMBER 4, 1975, AS RECORD NO. 3450 OF OFFICIAL RECORDS.

REGISTERED PROFESSIONAL ENGINEER SEAN M. SAVAGE No.75677 CIVIL STATE OF CALIFORNIA

FOR PLAN CHECK ONLY

SEAN M. SAVAGE R.C.E. 75677 DATE

PERRY STREET
CARSON STREET SS
CARSON, CA

JOB NUMBER: 20-817

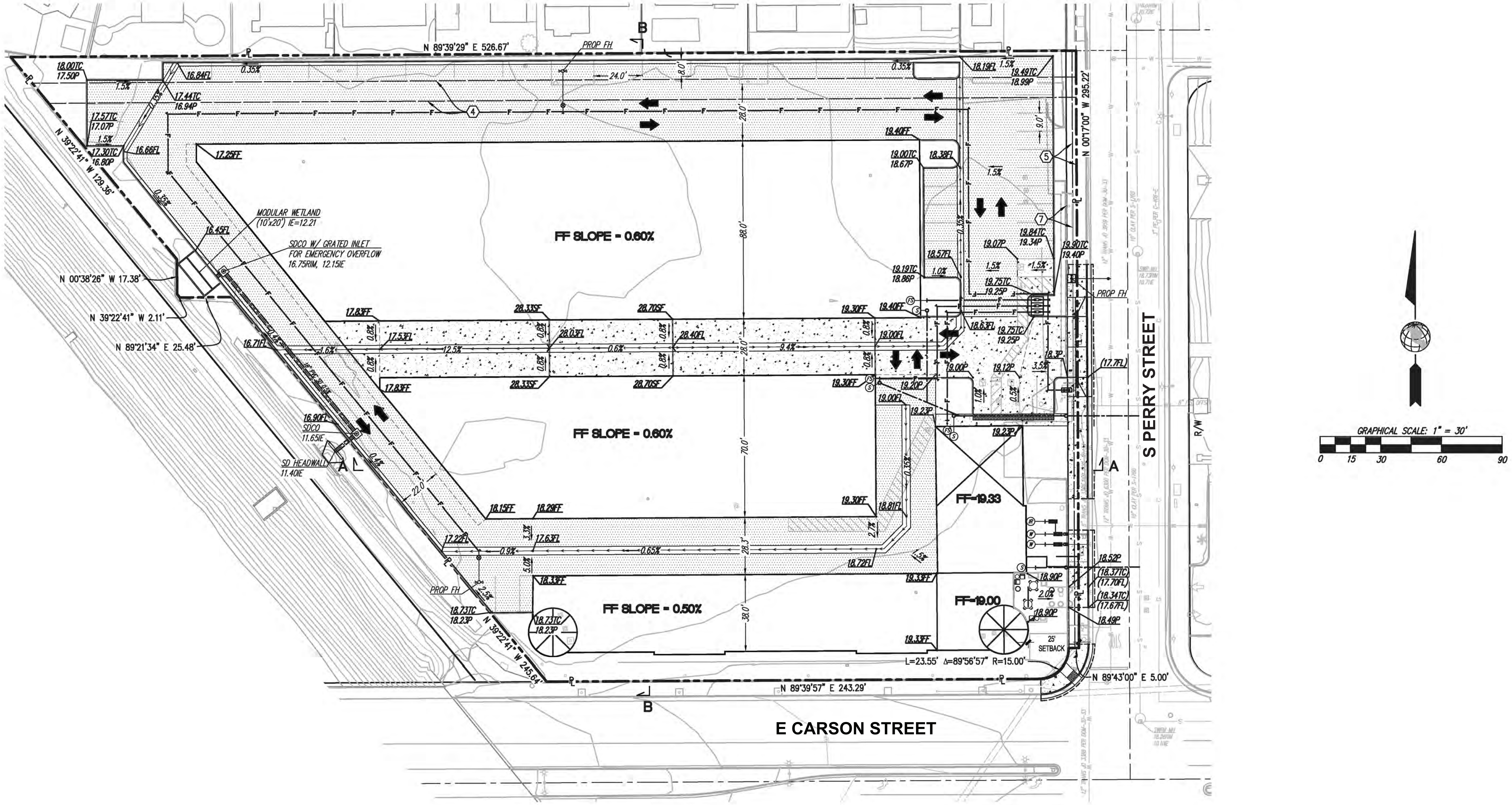
DATE: 10/05/2021

ja. JORDAN ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090

PRELIMINARY GRADING PLAN

PLAN PREPARED BY:

OMEGA
ENGINEERING CONSULTANTS
4340 VIEWRIDGE AVE. SUITE B
SAN DIEGO, CA 92123
PH:(858) 634-8620 FAX:(858)-634-8627

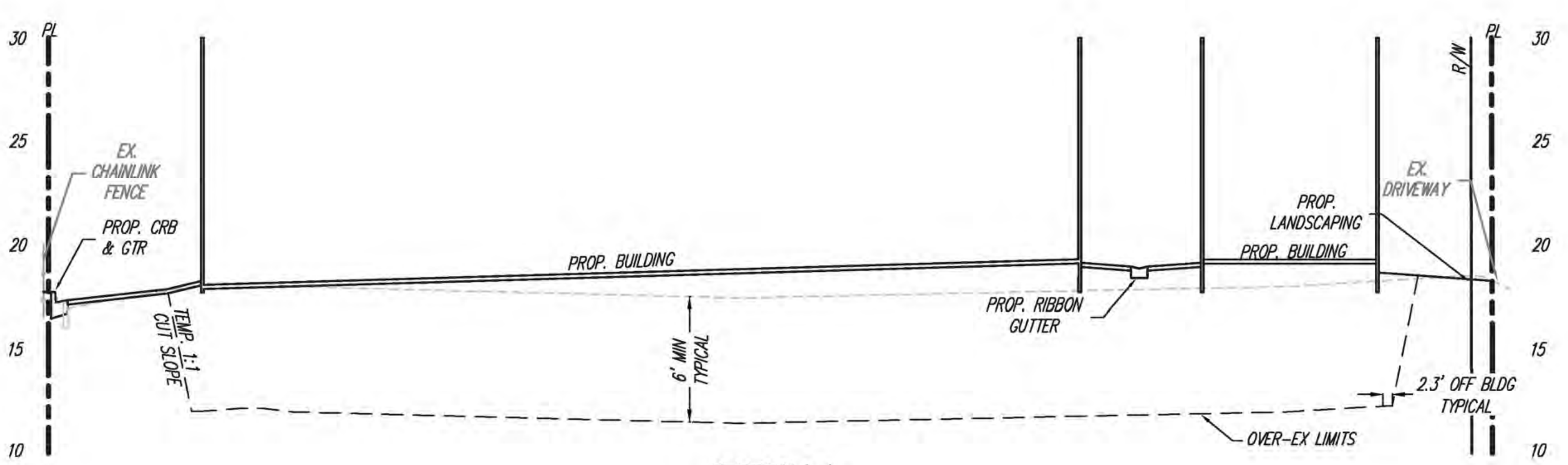


EXISTING LEGEND

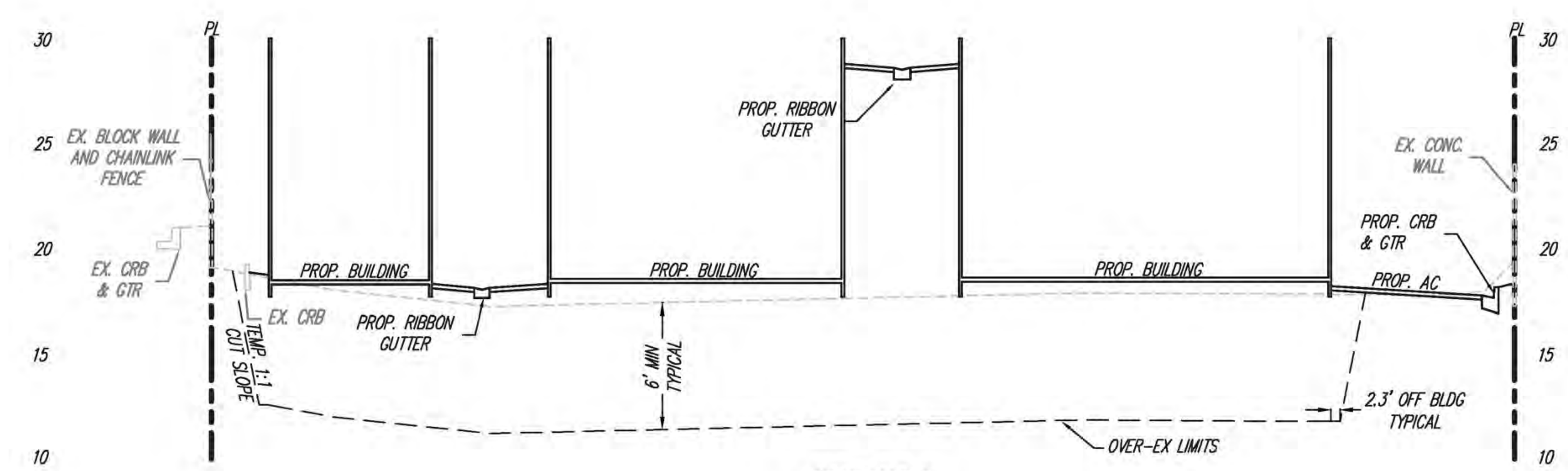
ITEM	SYMBOL
PROPERTY LINE	
CENTERLINE	
RIGHT-OF-WAY	
EX. CONTOUR	552
EX. CURB & GUTTER	

PROPOSED LEGEND

ITEM	SYMBOL
PROPOSED GRADE BREAK	
PROPOSED FINISH FLOOR SLOPE	FF SLOPE =0.5%
PROPOSED FINISH FLOOR ELEVATION	374.00FF
PROPOSED PAVEMENT ELEVATION	374.00P
PROPOSED FLOWLINE ELEVATION	374.00FL
PROPOSED GRADIANT	1.1%
PROPOSED 6" PCC CURB	
PROPOSED 6" PCC CURB & GUTTER	
PROPOSED FLOW LINE	
PROPOSED BUILDING	
PROPOSED PARKING STALL STRIPING	
PROPOSED HANDICAP STRIPING	
PROPOSED PVT. STORM DRAIN (SIZE PER PLAN)	
PROPOSED PVT. FIRE SERVICE LATERAL	
PROPOSED PVT. SEWER LATERAL	
PROPOSED SEWER POINT OF CONNECTION	S
PROPOSED FIRE POINT OF CONNECTION	FS
PROPOSED FIRE SERVICE BACKFLOW	
PROPOSED FDC/PIV	
PROPOSED FIRE HYDRANT	
PROPOSED PVT. STORM DRAIN CLEAN OUT/CONNECTION (SIZE AND TYPE PER PLAN)	
PROPOSED PVT. PCC PAVEMENT WALK	
PROPOSED PVT. ADA RAMP	
PROPOSED PVT. AC PAVEMENT HEAVY DRIVE AISLE	
PROPOSED PVT. MODULAR WETLAND	



SECTION A-A
HORIZONTAL SCALE 1"=30'
VERTICAL SCALE 1"=4'



SECTION B-B
HORIZONTAL SCALE 1"=30'
VERTICAL SCALE 1"=4'

PERRY STREET
CARSON STREET SS
CARSON, CA

REGISTERED PROFESSIONAL ENGINEER SEAN M. SAVAGE No.75677 CIVIL STATE OF CALIFORNIA

FOR PLAN CHECK ONLY

SEAN M. SAVAGE R.C.E. 75677 DATE

JOB NUMBER: 20-817

DATE: 10/05/2021

JORDAN ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090

FILENAME: P:\DWG OMEGA\0633 FARING SS CARSON\ACAD\DISCRETIONARY\0633-CSP-02-CGP.DWG

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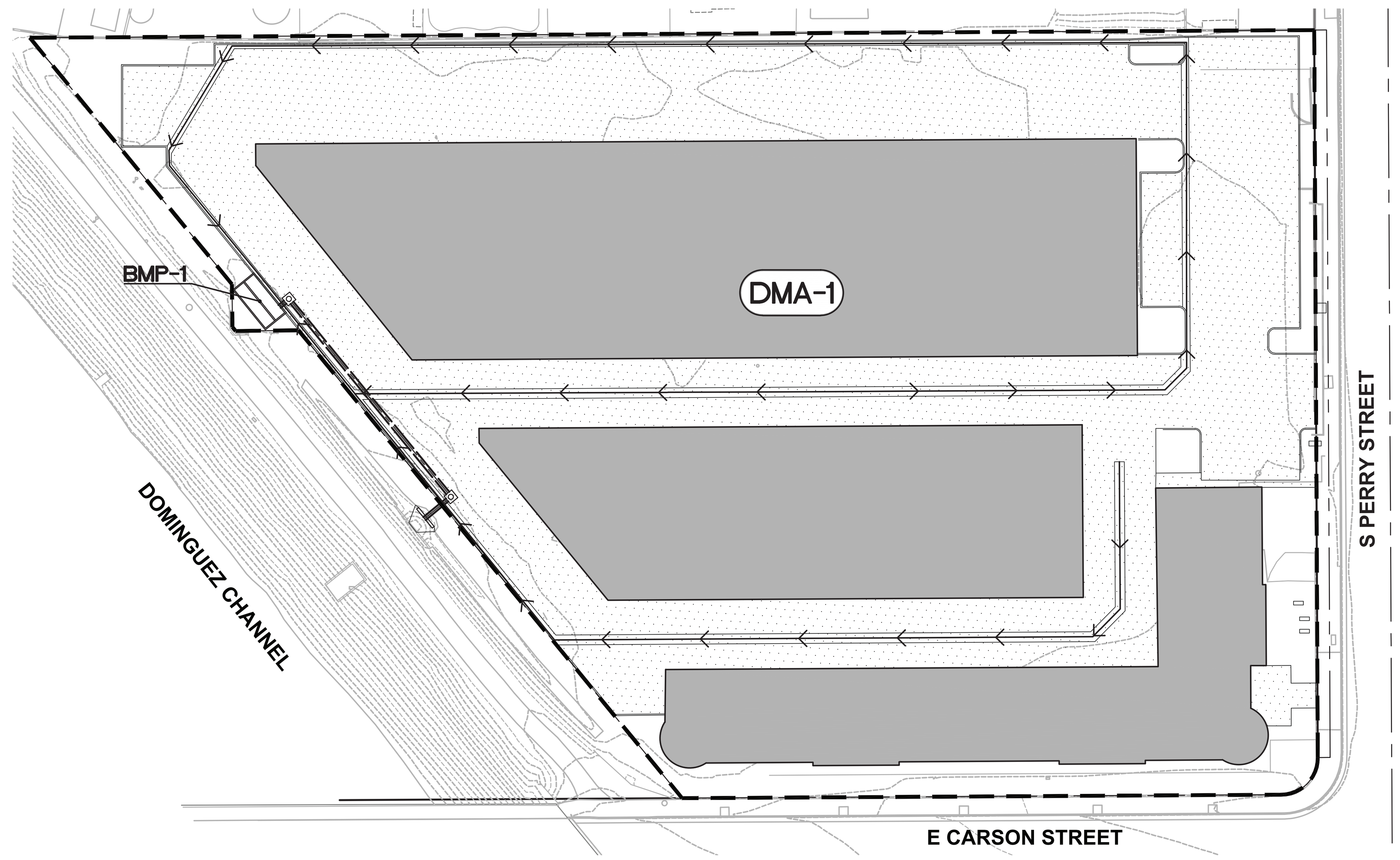

LEGEND

AREA LIMITS	
FLOW ARROWS	
BUILDING AREA	
PAVEMENT AREA	
DRAINAGE MGMT AREA (DMA) NUMBER	DMA-1

PLAN PREPARED BY:
OMEGA
ENGINEERING CONSULTANTS
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SAN DIEGO, CA 92123
PH:(858) 634-8620 FAX:(858)-634-8627

DMA DATA TABLE

DMA-NO.	TOT. AREA (SF)	IMPERVIOUS (%)	REQ'D FLOWRATE (CFS)	BMP FLOWRATE (CFS)	TYPE/TREATED BY
DMA-1	120,644	89.8	0.702	0.710	BMP-1/MODULAR WETLAND

GENERAL STORM WATER NOTES

1. GROUNDWATER IS ANTICIPATED AT APPROXIMATELY 12.5 FEET BELOW EXISTING GRADE ON SITE.
2. NO EXISTING NATURAL HYDROLOGIC FEATURES
3. NO SIGNIFICANT ECOLOGICAL AREAS ON SITE
4. ALL APPLICABLE SOURCE CONTROL BMPS SHALL BE IMPLEMENTED
   5A. SOURCE CONTROL NOTES TO COME IN MINISTERIAL REVIEW

Peak Flow Hydrologic Analysis

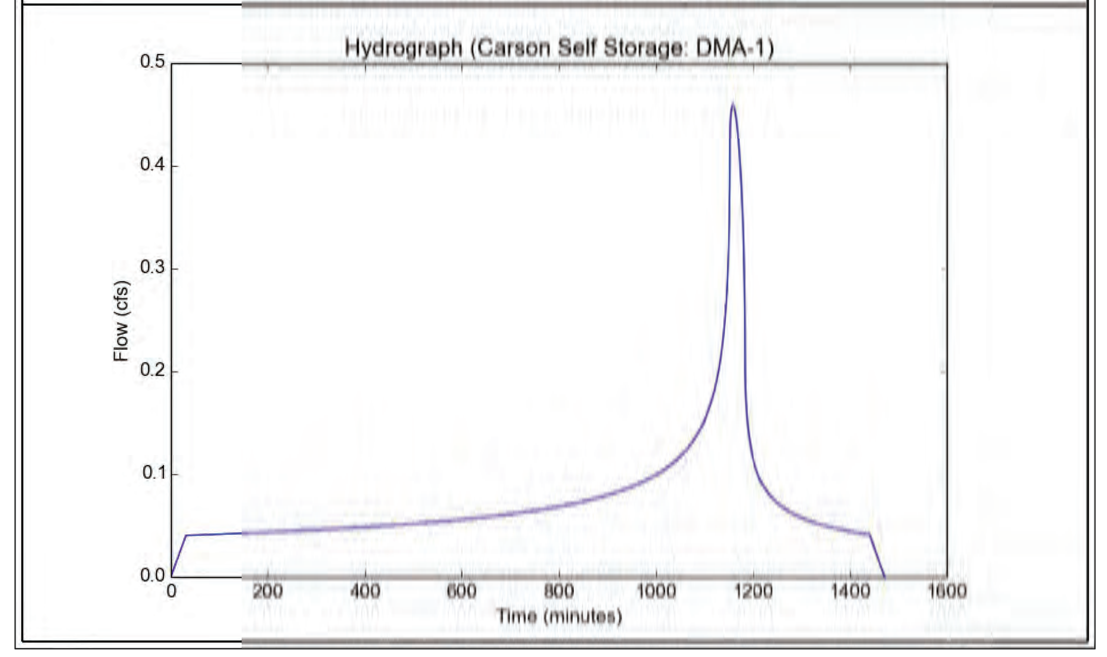
File location: P:/DWG OMEGA/0633 Faring SS Carson/STORMWATER REPORTS/Water Quality/ATTACHMENTS/85th Percentile Hydro
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Carson Self Storage
Subarea ID	DMA-1
Area (ac)	2.77
Flow Path Length (ft)	475.0
Flow Path Slope (vft/hft)	0.006
85th Percentile Rainfall Depth (in)	0.8
Percent Impervious	0.898
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.8
Peak Intensity (in/hr)	0.2025
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8184
Time of Concentration (min)	31.0
Clear Peak Flow Rate (cfs)	0.459
Burned Peak Flow Rate (cfs)	0.459
24-Hr Clear Runoff Volume (ac-ft)	0.1499
24-Hr Clear Runoff Volume (cu-ft)	6528.9479



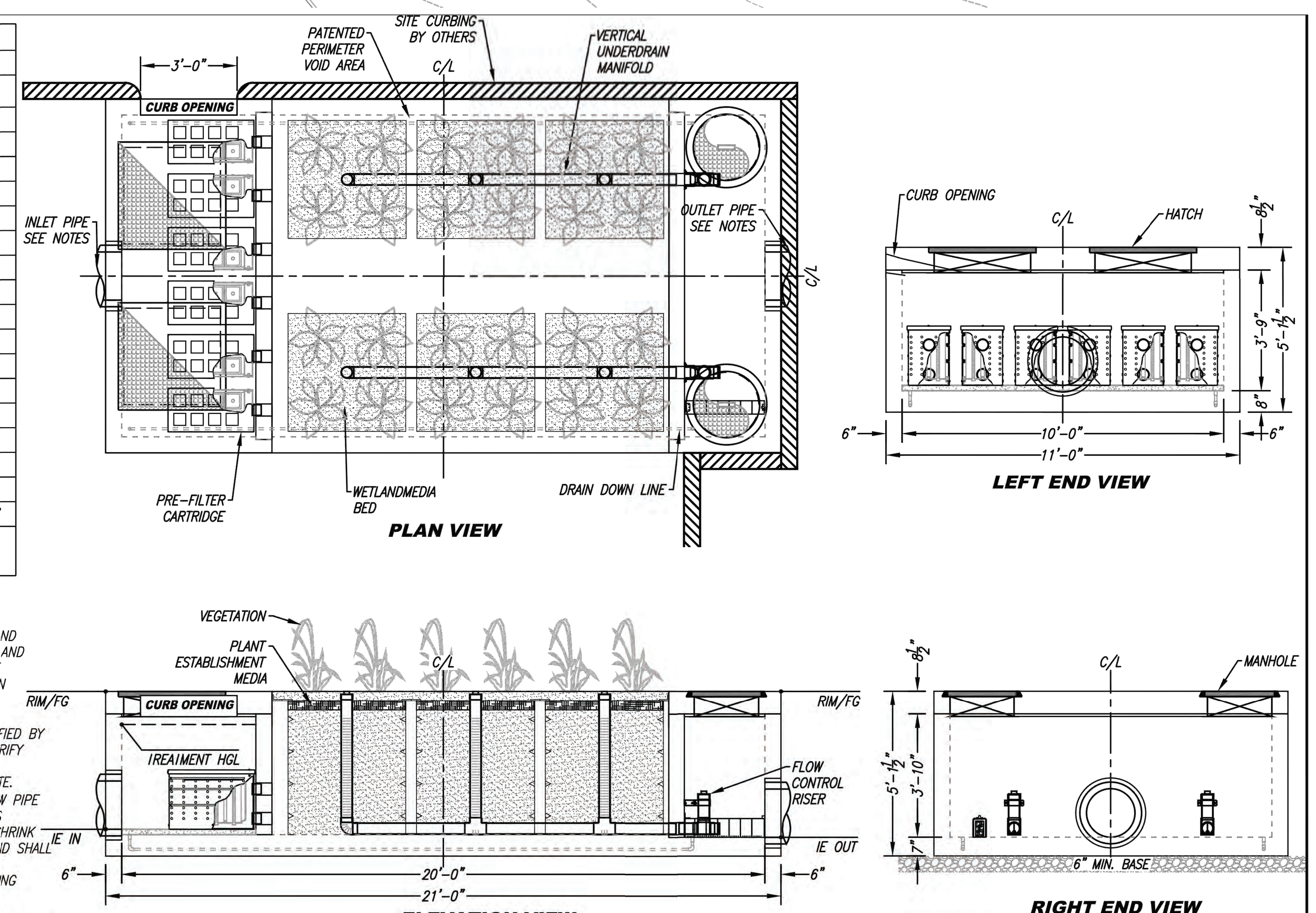
PROJECT HYDROGRAPH

GRAPHICAL SCALE: 1" = 40'

SITE SPECIFIC DATA

PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.710	
TREATMENT HGL AVAILABLE (FT)			N/K
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			FLOW BY
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESIRIAN	OPEN PLANIER	PEDESTRIAN
FRAME & COVER	2 EA 36" X 36"	N/A	2 EA ø24"
WETLANDMEDIA VOLUME (CY)			
ORIFICE SIZE (DIA. INCHES)			2 EA ø2.67"

NOTES: PRELIMINARY. NOT FOR CONSTRUCTION.



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 MANUFACTURERS 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 TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. 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 GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING MODULAR WETLANDS FOR ACTIVATION OF UNIT. MANUFACTURES WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A MODULAR WETLANDS 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 MANUFACTURER.

LOW INFLOW PIPE DISCLOSURE:

IT IS RECOMMENDED THAT A SUFFICIENT VARIATION IN ELEVATION BETWEEN THE INLET AND OUTLET BE PROVIDED TO ALLOW FOR ACCUMULATION OF SEDIMENT IN THE PRE-TREATMENT CHAMBER. FAILURE TO DO SO MAY RESULT IN BLOCKAGE AT INFLOW POINT(S) WHICH MAY CAUSE UPSTREAM FLOODING.

TREATMENT FLOW (CFS)	0.710
OPERATING HEAD (FT)	3.5
PRETREATMENT LOADING RATE (GPM/SF)	2.1
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MODULAR WETLANDS SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MODULAR WETLANDS SYSTEMS IS PROHIBITED.

Bio Clean
A Forterra Company

MWS-L-10-20-4'-5.5"-C-HC
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

MODULAR WETLAND DETAIL

NOT TO SCALE

PERRY STREET
CARSON STREET SS
CARSON, CA

REGISTERED PROFESSIONAL ENGINEER
SEAN M. SAVAGE
No.75677
CIVIL
STATE OF CALIFORNIA

FOR PLAN CHECK ONLY

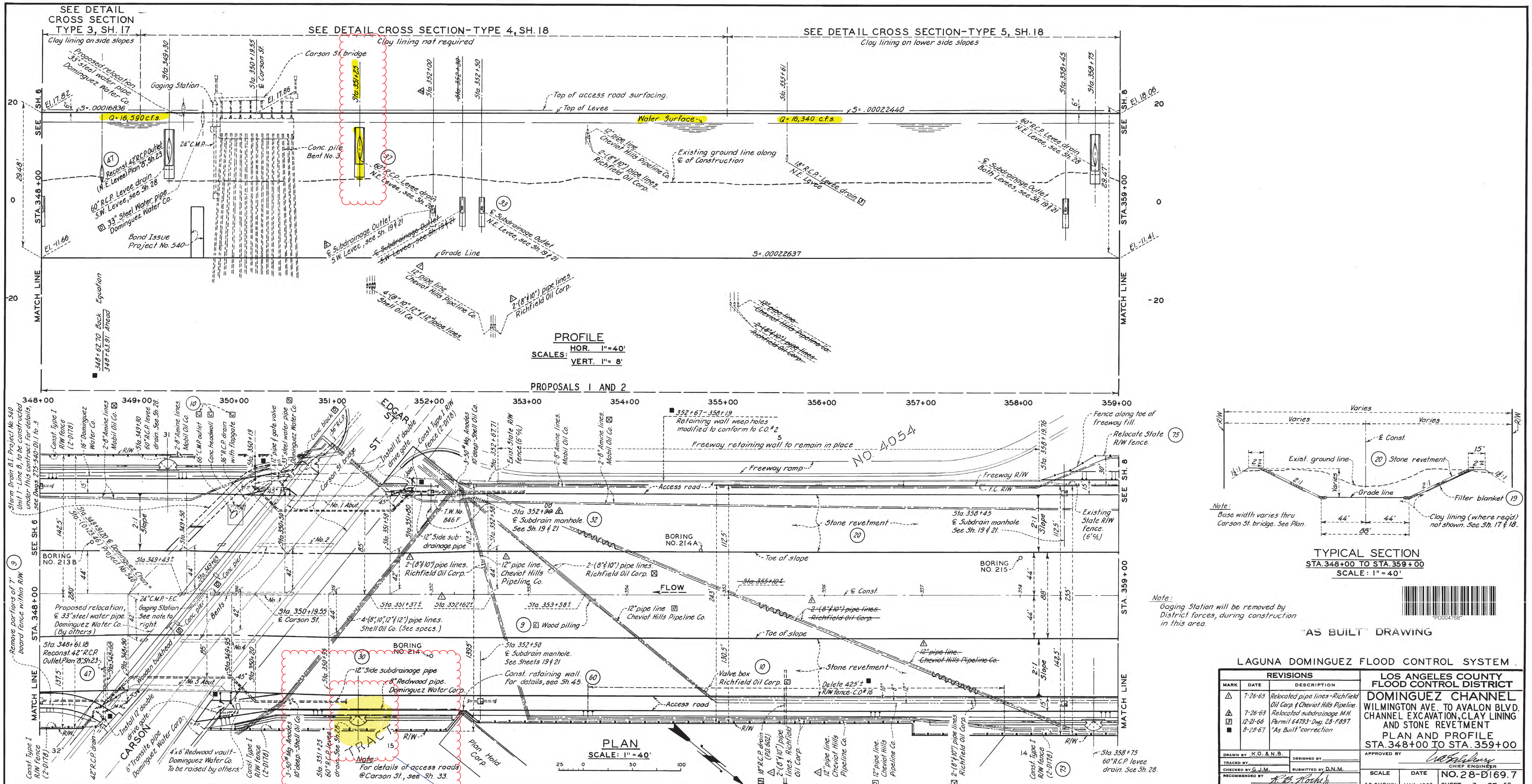
SEAN M. SAVAGE R.C.E. 75677 DATE

JOB NUMBER: 20-817

DATE: 10/05/2021

JORDAN ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090

FILENAME: P:\DWG OMEGA\0633 FARING SS CARSON\ACAD\DISCRETIONARY\0633-CSP-03-DMA.DWG
DATE: 5/14/2021 11:41:32 AM



Note: Utilize existing 60" RCP storm drainlocated at Sta.351+25.00 to discharge into Dominguez Channel.

DUE DILIGENCE REPORT

Perry St Storage
21611 Perry St
Carson, CA 90745
21611 Perry Street LLC

21611 Perry St
Carson, CA 90745
Attn: Darren Embry

DUEx
17291 Irvine Blvd, Suite 206
Tustin, CA 92780
Tel: (626) 319-3590
www.duexperts.com

E006-2101
Gabriel Camacho
2/21/2022

TABLE OF CONTENTS

PROJECT CONTACTS

- **21611 Perry Street LLC**
  Darren Embry
  (323) 481.9178
  E: Darren@faring.com

- **DUEx**
  17291 Irvine Blvd, Suite 206
  Tustin, CA 92780
  Gabriel Camacho
  P: (626) 319-3590 | E: Gabriel@duexperts.com

- **SOUTHERN CALIFORNIA EDISON**
  P.O. Box 4699, Compton, CA 90224
  1924 Cashdan Street, Compton, CA 90224
  Tel: (310) 608-5023
  Planner to be determined when electrical loads are submitted.

- **SOUTHERN CALIFORNIA GAS**
  Planner to be determined when gas loads are submitted.

- **AT&T**
  Planner to be determined when service is requested.

- **CHARTER**
  Planner to be determined when service is requested.

VICINITY MAP

PROJECT SUMMARY

SITE SUMMARY

21611 Perry Street LLC is performing due diligence for their project in the city of Carson. DUEx has been retained to provide dry utility feasibility and a summary of findings. This report will summarize closest source and costs.

ELECTRIC: SOUTHERN CALIFORNIA EDISON

SCE will be the electric service provider for this project. Records are attached.

Title 24 of the California Code of Regulations regulates energy consumption in new construction. The standards regulate energy consumed in buildings for heating, cooling, ventilation, and lighting. Title 24 is implemented through the local plan check and permit process. The current (2016) standards effective date is January 1, 2017, and it applies for new construction of both residential and non-residential buildings.

Existing:

There is no apparent existing electrical structure or equipment on site but will be verified during the removal process.

Proposed:

- **Temporary Power:** There is overhead power available from the pole at the south-east corner of the property which can be a potential source, given that the temporary power is no more than 200A-600A Single Phase.

- **Permanent Power:** SCE will need to run primary cabling from the existing Edison manhole on Perry St. to the proposed onsite 10'x12' transformer pad approximately 175' away. Based off historical data provided by SCE, to service buildings of this size & expected usage in this climate zone, we anticipate a single transformer to feed the entire site. We've provided all estimated kVA's per building on the proposed utility exhibit.

GAS: SOUTHERN CALIFORNIA GAS COMPANY

SoCalGas will be the natural gas provider for this area. Records are attached.

As a public utility, the Southern California Gas Company (the Gas Co.) is under jurisdiction of the California Public Utilities Commission. As mentioned in section 3.2.3, Title 24 of the California Code of Regulations regulates energy consumption in new constructions. The standards regulate energy consumed in buildings for heating, cooling, ventilation, and lighting. Title 24 is implemented through the local plan check and permit process. The Gas Co.'s 2018 Gas Report that commercial and industrial demand is expected to increase at an annual rate of 0.2 percent. This is mainly due to increased efficiency of power plants and the statewide efforts to use renewable sources of energy for electricity generation.

Existing:

There is no apparent existing gas equipment on site but will be verified during the removal process.

Proposed:

The nearest gas mainline is located on Perry St. east of the property. SoCal Gas will need to obtain permits to conduct work in the public right of way.
Please note: Gas meters must be 3' from any open doors and windows, if under an opening window, window must be minimum 10' above. Gas meters must be easily accessible for emergencies & for maintenance.

TELEPHONE: AT&T

AT&T is the telephone and fiber provider for the project. Will Serve Letter attached.

As a private utility, telecommunications service providers operate jurisdiction of the California Public Utilities Commission. As mentioned in section 3.2.3, Title 24 of the California Code of Regulations regulates energy consumption in new constructions. The standards regulate energy consumed in buildings for heating, cooling, ventilation, and lighting. Title 24 is implemented through the local plan check and permit process.

Existing:

There is no apparent existing telephone structure or equipment on site but will be verified during the removal process.

Proposed:

The nearest existing telephone provider tie in point is located overhead on Carson St. AT&T will run their services to our proposed pull box located near Perry St.

The AT&T point of connection is pending confirmation. Development is responsible to route within the property to designed MPOE location.

- Typical AT&T marketing agreement will need to be executed for AT&T to bring fiber to the site.

CATV: CHARTER

Charter is the cable tv and fiber provider for the project. Records are attached.

As a private utility, telecommunications service providers operate jurisdiction of the California Public Utilities Commission. As mentioned in section 3.2.3, Title 24 of the California Code of Regulations regulates energy consumption in new constructions. The standards regulate energy consumed in buildings for heating, cooling, ventilation, and lighting. Title 24 is implemented through the local plan check and permit process.

Existing:

There is no apparent existing cable TV structure or equipment on site but will be verified during the removal process.

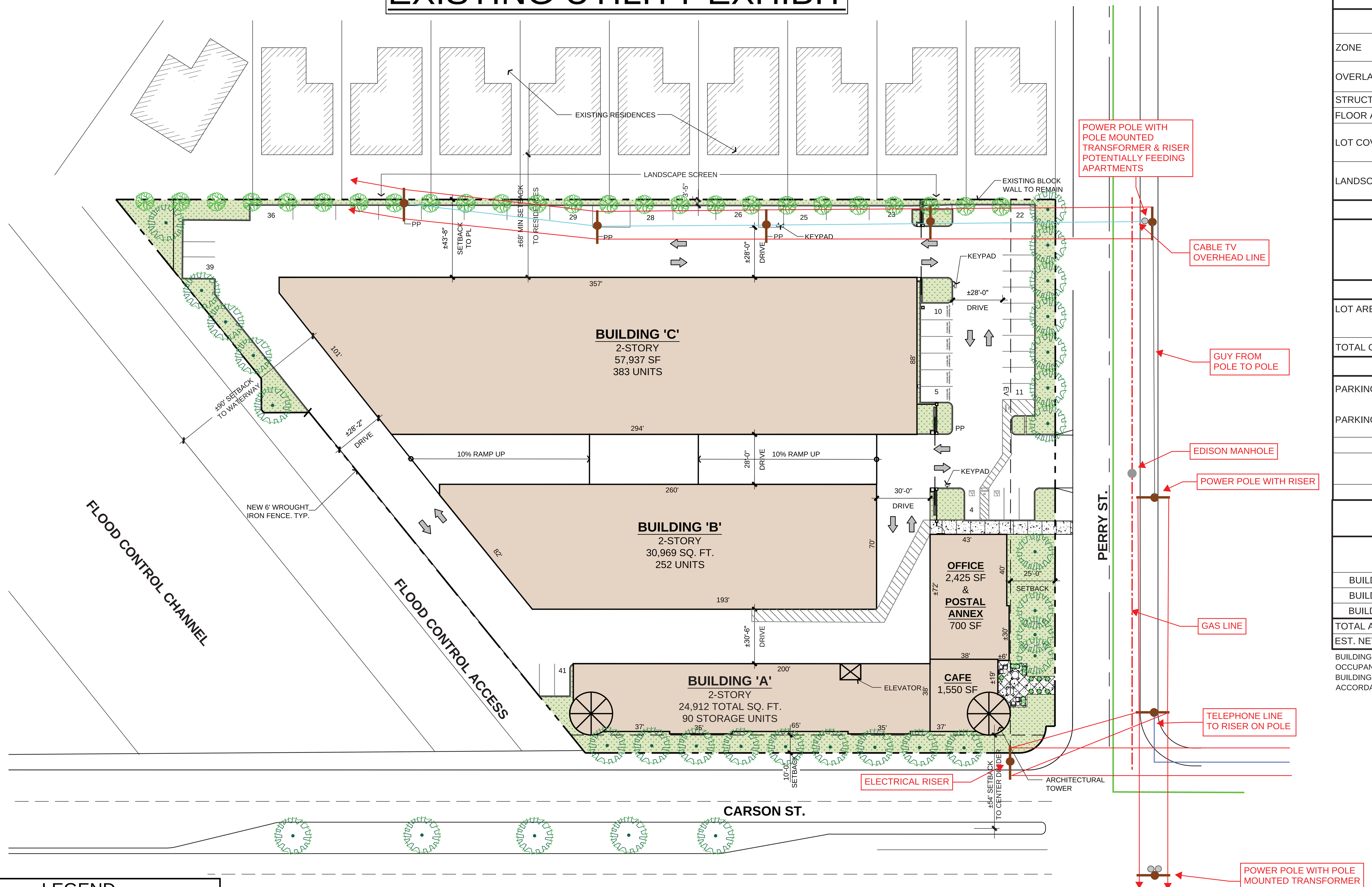
Proposed:

The nearest existing cable provider tie in point is located overhead on the north side of the property near Perry St. Charter will run their services to our proposed pull box located near Perry St.

The Charter point of connection is pending confirmation. Development is responsible to route within the property to designed MPOE location.

- Typical Charter marketing agreement will need to be executed for Charter to bring fiber to the site.

EXISTING UTILITY EXHIBIT



LEGEND

ELECTRIC	red line
CATV	light blue line
TEL	blue line
GAS	green line

BASIS OF DESIGN	REQUIRED / EXISTING	PROVIDED / PROPOSED
ZONE	ML - MANUFACTURING, LIGHT	TBD
OVERLAY	D OVERLAY	
STRUCTURE HEIGHT	N/A	TBD
FLOOR AREA RATIO	.5 (GP)	.99 (118,928)
LOT COVERAGE	-	46.6% (56,906 S.F.)
LANDSCAPE	-	±23,000 S.F. (18.8%) LANDSCAPE AREA
SETBACKS		
FRONT	25'	25 FT. MIN.
STREET SIDE	10 FT.	10 FT. MIN
REAR (RESIDENTIAL)	10 FT.	40 FT. MIN
INTERIOR SIDE	10 FT.	28' FT. MIN.
SITE DATA		
LOT AREA	121,968	SQ. FT.
	2.8	ACRES
TOTAL GROSS BLDG. AREA	113,805	SQ. FT.
PARKING		
PARKING SPACES	1 SPACE PER 20 UNITS 725/20 = ±36 STALLS	41 SPACE
PARKING SIZE	STANDARD: 8.5' X 18' PARALLEL: 8' X 24'	STANDARD: 8.5' X 18' PARALLEL: 8' X 24'
PARKING PROVIDED		
STANDARDS	39	
ACCESSIBLE	2	
TOTAL	41	

BUILDING AREA TABULATIONS (Square Feet)

	SELF STORAGE	OFFICE/POSTAL ANNEX/CAFE	TOTAL
BUILDING A 2-STORY	20,133	4,675	24,808
BUILDING B 2-STORY	30,969		30,969
BUILDING C 2-STORY	57,937		57,937
TOTAL AREA:	109,039	4,675	113,714
EST. NET STORAGE AREA = 81,840 S.F.			

BUILDING CONSTRUCTION TYPE: IIB
OCCUPANCY CLASSIFICATION: S-1. TOP STORAGE IN NOT GRATER THAN 8'
BUILDINGS ARE EQUIPPED WITH AUTOMATIC FIRE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13.

PERRY STREET STORAGE

CARSON, CA

SCHEME I

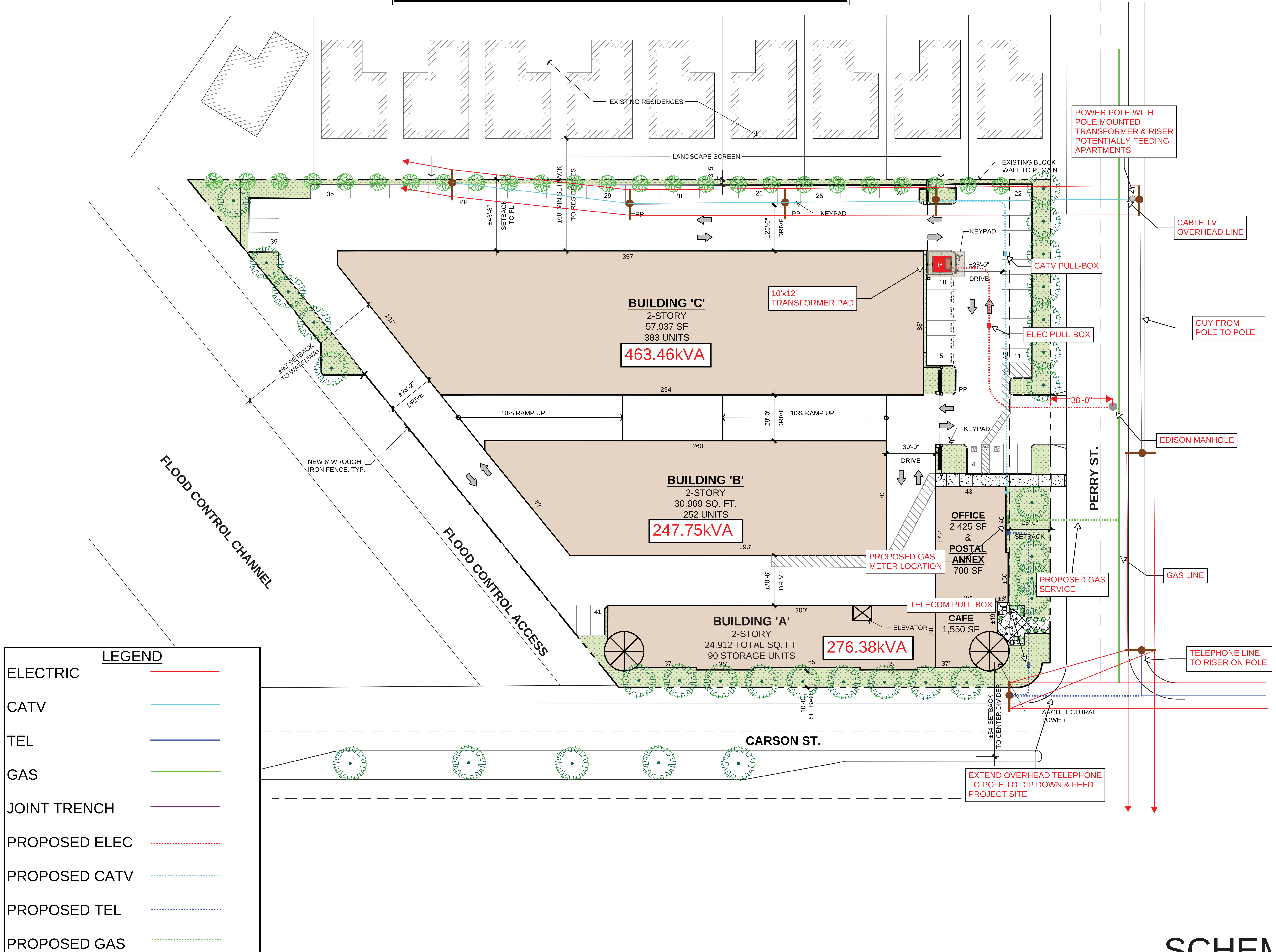
PRELIM. SITE PLAN

JOB NUMBER: 20-817
SCALE: 1"=30'-0"
DATE: 12/16/2021

ja
JORDAN ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090

SHEET A1

PROPOSED UTILITY EXHIBIT



BASIS OF DESIGN

	REQUIRED / EXISTING	PROVIDED / PROPOSED
ZONE	ML - MANUFACTURING, LIGHT	TBD
OVERLAY	D OVERLAY	
STRUCTURE HEIGHT	N/A	TBD
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TOTAL AREA:	109,039	4,675	113,714
EST. NET STORAGE AREA = 81,840 S.F.			

BUILDING CONSTRUCTION TYPE: IIB
OCCUPANCY CLASSIFICATION: S-1. TOP STORAGE IN NOT GRATER THAN 8'
BUILDINGS ARE EQUIPPED WITH AUTOMATIC FIRE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13.

NORTH

PERRY STREET STORAGE

CARSON, CA

SCHEME I

PRELIM. SITE PLAN

JOB NUMBER: 20-817
SCALE: 1"=30'-0"
DATE: 12/16/2021

JORDAN ARCHITECTS
131 CALLE IGLESIA, SUITE 100
SAN CLEMENTE, CA 92672
949.388.8090

SHEET A1

Upper Left: 118°15'33"W 33°50'4"N

Page to the North: LT-8344-D

Upper Right: 118°15'13"W 33°50'4"N

Page to the West: LT-8344-E

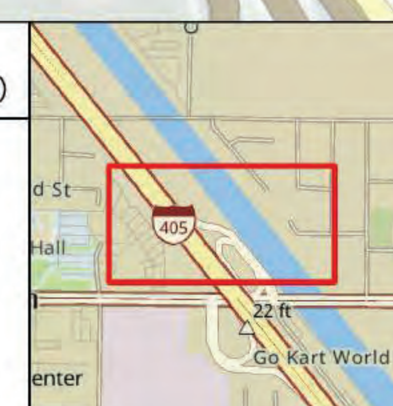
Page to the East: LT-8444-E

Facility Map

UNDERGROUND SERVICE ALERT DIAL 811
CALL USA FOR UNDERGROUND LOCATING

Grid Name: LT-8344-F (US National Grid)

SUBSTATION_BOUNDARY	OH Conductor 0 - 750 volts	UG Conductor 750-22,500 volts
DIST BURD	OH Conductor 750 - 22,500 volts	UG Conductor 22.5 - 300 kV
DIST HANDHOLE	OH Conductor 22.5 - 300 kV	UG Conductor 66 - 300 kV
DIST PAD	OH Conductor 66 - 300 kV	UG Conductor 300 - 500 kV (mm)
DIST POLE	OH Conductor 300 - 500 kV (mm)	DUCT DIA in inches
DIST STREET LIGHTS	UG Conductor 0-750 volts	Parcels



Date: 1/28/2022
Geomatics | Central Field Services

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National Geographic Style: Esri Community Maps Contributors, City of Carson, County of Los Angeles, California State Parks, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA
National Geographic Style Base Sources: Esri, USGS
World Hillshade: Esri, NASA, NGA, USGS, FEMA

0 35 70 140 Feet
1 inch equals 107 feet

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Page to the South: LT-8344-H

Billing department; SCE only charges for maps that include SCE infrastructure.

Upper Left: 118°15'33"W 33°49'56"N

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Upper Right: 118°15'13"W 33°49'56"N

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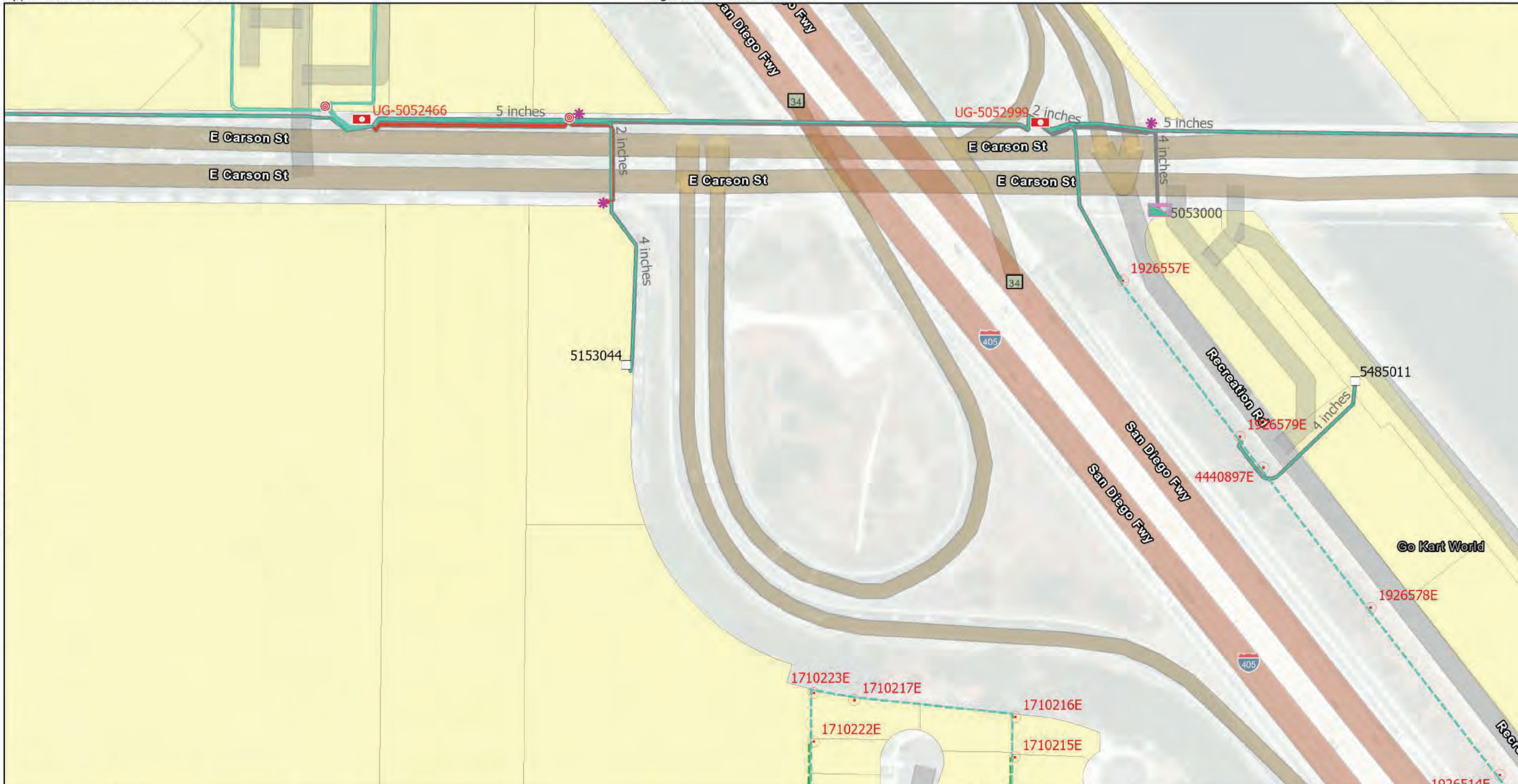

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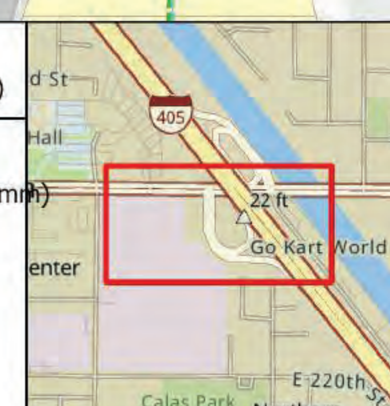
Facility Map

UNDERGROUND SERVICE ALERT DIAL 811
CALL USA FOR UNDERGROUND LOCATING

Grid Name: LT-8344-H (US National Grid)

SUBSTATION_BOUNDARY	DIST SPLICEBOX	OH Conductor 66 - 300 kV	UG Conductor 66 - 300 kV
DIST PAD	DIST VAULT	OH Conductor 300 - 500 kV (mm)	UG Conductor 300 - 500 kV (mm)
DIST PEDESTAL	OH Conductor 0 - 750 volts	UG Conductor 0-750 volts	DUCT DIA in inches
DIST POLE	OH Conductor 750 - 22,500 volts	UG Conductor 750-22,500 volts	Parcels
DIST PULLBOX	OH Conductor 22.5 - 300 kV	UG Conductor 22.5 - 300 kV	

NO CHARGE



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National Geographic Style Base Sources: Esri, USGS
World Hillshade: Esri, NASA, NGA, USGS, FEMA

0 35 70 140 Feet
1 inch equals 107 feet

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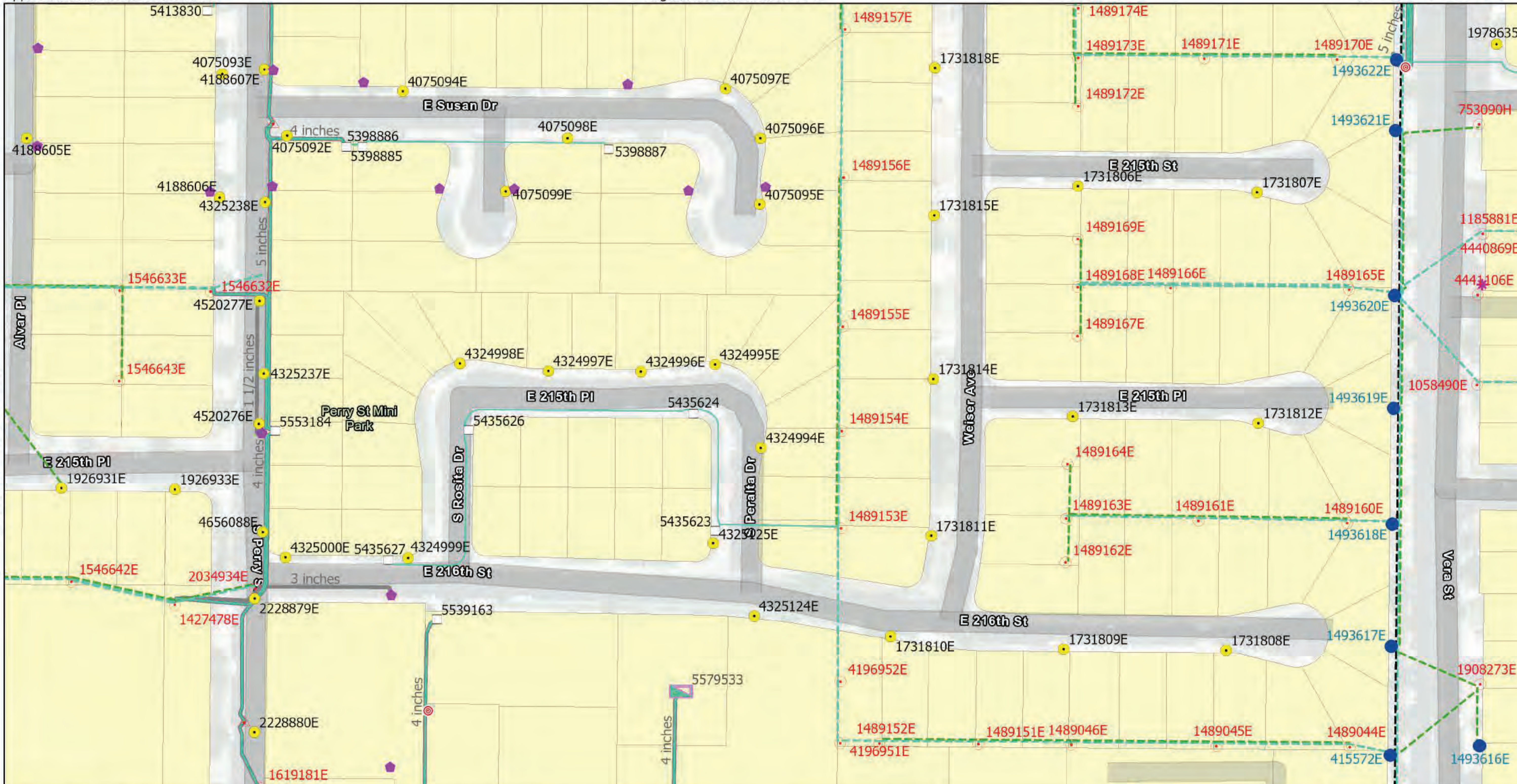


Page to the East: LT-8444-F

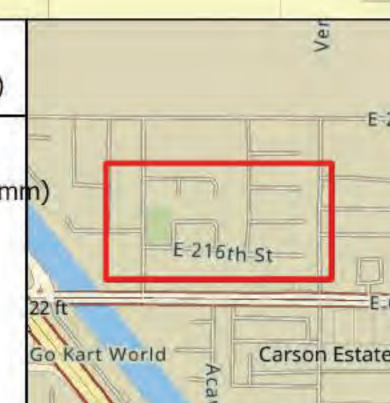
Billing department; SCE only charges for maps that include SCE infrastructure.

Facility Map

UNDERGROUND SERVICE ALERT DIAL 811
CALL USA FOR UNDERGROUND LOCATING

Grid Name: LT-8444-E (US National Grid)

SUBSTATION_BOUNDARY	DIST PULLBOX	OH Conductor 22.5 - 300 kV	UG Conductor 66 - 300 kV
DIST HANDHOLE	DIST SPLICEBOX	OH Conductor 66 - 300 kV	UG Conductor 300 - 500 kV (mm)
DIST MANHOLE	DIST STREET LIGHTS	OH Conductor 300 - 500 kV (mm)	DUCT DIA in inches
DIST PAD	TRNS POLE	UG Conductor 0-750 volts	Parcels
DIST PEDESTAL	OH Conductor 0 - 750 volts	UG Conductor 750-22,500 volts	
DIST POLE	OH Conductor 750 - 22,500 volts	UG Conductor 22.5 - 300 kV	



Date: 1/28/2022

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0 35 70 140 Feet

1 inch equals 107 feet

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL Company

Page to the South: LT-8444-G

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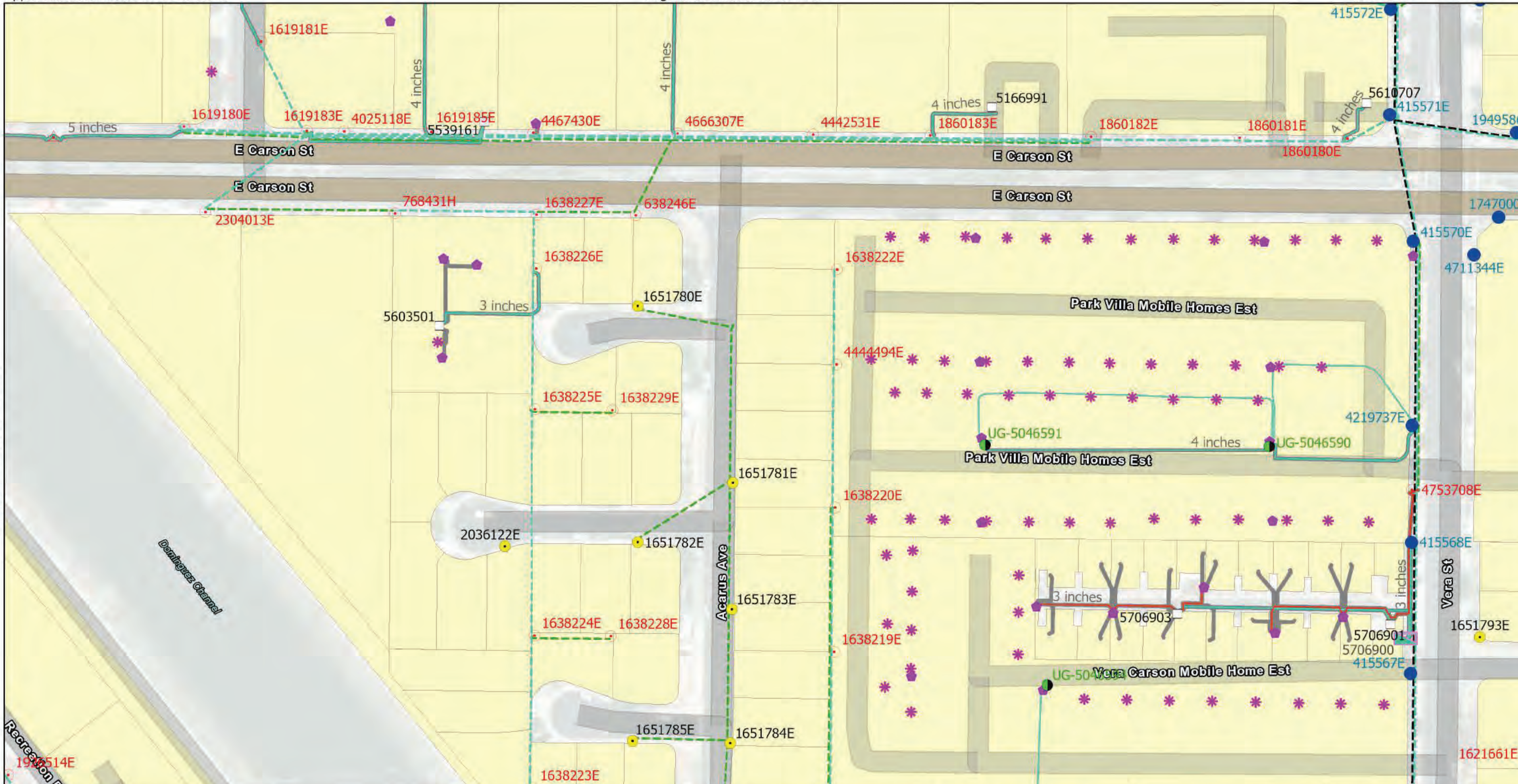
Page to the East: LT-8444-H



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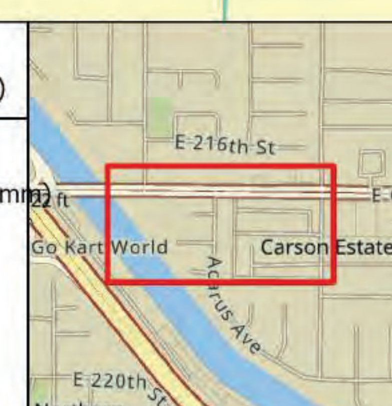
Billing department; SCE only charges for maps that include SCE infrastructure.

Facility Map

UNDERGROUND SERVICE ALERT DIAL 811
CALL USA FOR UNDERGROUND LOCATING

Grid Name: LT-8444-G (US National Grid)

- SUBSTATION_BOUNDARY
- DIST BURD
- DIST HANDHOLE
- DIST MANHOLE
- DIST PAD
- DIST PEDESTAL
- DIST POLE
- DIST PULLBOX
- DIST STREET LIGHTS
- TRNS POLE
- OH Conductor 0 - 750 volts
- OH Conductor 750 - 22,500 volts
- OH Conductor 22.5 - 300 kV
- OH Conductor 66 - 300 kV
- OH Conductor 300 - 500 kV (mm)
- UG Conductor 0-750 volts
- UG Conductor 750-22,500 volts
- UG Conductor 22.5 - 300 kV
- UG Conductor 66 - 300 kV
- UG Conductor 300 - 500 kV (mm)
- DUCT DIA in inches
- Parcels



Date: 1/28/2022
Geomatics | Central Field Services

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0 35 70 140 Feet

1 inch equals 107 feet

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

701 N. Bullis Rd.
Compton, CA 90224-9099

February 7, 2022

Duex
17291 Irvine Blvd, Suite 206
Tustin, CA 92780
Attn: Nick Molina

Subject: Maps & Will Serve - 21611 S. Perry St, Carson, CA 90745

Thank you for inquiring about the availability of natural gas service for your project. We are pleased to inform you that Southern California Gas Company (SoCalGas) has facilities in the area where the above named project is being proposed. The service would be in accordance with SoCalGas' policies and extension rules on file with the California Public Utilities Commission (CPUC) at the time contractual arrangements are made.

This letter should not be considered a contractual commitment to serve the proposed project, and is only provided for informational purposes only. The availability of natural gas service is based upon natural gas supply conditions and is subject to changes in law or regulation. As a public utility, SoCalGas is under the jurisdiction of the Commission and certain federal regulatory agencies, and gas service will be provided in accordance with the rules and regulations in effect at the time service is provided. Natural gas service is also subject to environmental regulations, which could affect the construction of a main or service line extension (for example, if hazardous wastes were encountered in the process of installing the line). Applicable regulations will be determined once a contract with SoCalGas is executed.

If you need assistance choosing the appropriate gas equipment for your project, or would like to discuss the most effective applications of energy efficiency techniques, please contact our area Service Center at 800-427-2200.

Thank you again for choosing clean, reliable, and safe natural gas, your best energy value.

Sincerely,

Jason Sum

Jason Sum
Pipeline Planning Assistant
SoCalGas-Compton HQ

C-410-E

C-638-E

C-411-E

C-407-E

Map Number: C-406-E

Map Type: Gas Asset Map

Printed By: Sum, Jason

Printed Date: 2/7/2022

LIABILITY STATEMENT
The facilities and their depiction on these maps are believed to be reasonably accurate, but the maps are not to be used in lieu of field verification or calling USA at 800-422-4133. NO WARRANTY expressed or implied (including of merchantability or of fitness for particular purpose) is made as to any matter, including but not limited to, the design, size, type or location of the facilities, their presence of absence, the accuracy of the maps, the means used to transmit the data, absence of viruses (if transmitted electronically, by disk or diskette), data translation or transmission errors or omissions, compatibility with the user's system or its ability to interpret the data correctly or at all, or any other matter. The Gas Company has no liability for damages (direct, indirect, consequential, incidental or punitive) arising from the transmission, receipt or use by others of the maps or information contained in the maps.

SoCalGas
A Sempra Energy utility

Charter
COMMUNICATIONS

Will Serve Letter

2/22/2022

Nick Molina
DUEx (Dry Utility Experts)
17291 Irvine Blvd, Suite 206
Tustin, CA 92780

Project Name: WSL - 21611 S Perry St, Carson, CA 90745
LOCATION: 21611 S Perry St, Carson, CA 90745

Re: May Serve Letter by Charter Communications or an affiliate authorized to provide service ("Charter")

Thank you for your interest in receiving Charter service. The purpose of this letter is to confirm that the Property is within an area that Charter may lawfully serve. However, it is not a commitment to provide service to the Property. Prior to any determination as to whether service can or will be provided to the Property, Charter will conduct a survey of the Property and will need the following information from you:

- Exact site address and legal description
- Is this an existing building or new construction?
- Site plans, blue prints, plat maps or any similar data
- The location of any existing utilities or utility easements
- ____

Please forward this information to the construction manager listed below. Upon receipt, a Charter representative will be assigned to you to work through the process. Ultimately, a mutually acceptable service agreement for the Property will be required and your cooperation in the process is appreciated.

Construction Manager Contact:
Diaz, Ana
Director, Enterpise Service Delivery
17777 Center Court Drive North, 8th Floor
Cerritos CA 90703
562-677-0325
DL-Enterprise-MET-West@charter.com

Sincerely,

DocuSigned by:
Ana Diaz
311326782FB0483...


Green-existing charter underground facilities within project limits.
21611 S Perry St, MAP
Carson, CA 90745
Red-existing charter aerial facilities within project limits.
E 215TH PL
E 216TH ST
E CARSON ST
S PERRY ST
S ROSITA DR
ALVAR PL
THOMAS DR
S PERALTA DR
WEISER AVE
E SUSAN DR
E 214TH ST
E 215TH ST
E 215TH PL
E 216TH ST
ASHMILL ST
CLOVERBROOK ST
E 218TH ST
VERA LN
VERA ST
ACACIAS AVE
NO NAME
I-405 N
I-405 S
RECREATION RD
S TROYTON LN
21611

`

AT&T California
17200 S Vermont Ave,
Floor 2nd
Gardena, CA 90247 USA

01/31/2022

Attn: Nick Molina

RE: 21611 S Perry St, Carson, CA 90745

Dear Applicant:

Under its present plans, AT&T California expects to be in a position to provide telephone service to applicants in the above project upon request, in accordance with requirements of, and at rates and charges specified in its tariffs on file with the California Public Utilities Commission.

This project will be served with AT&T facilities. In accordance with the above-mentioned tariffs, the applicant or customer, on his property will be responsible for furnishing, installing, and maintaining the conduit AT&T requires for the service connection.

Please do not hesitate to contact me if you have any further questions.

Respectfully,

Kosal Sieng
17200 S Vermont Ave,
Floor 2nd
Gardena, CA 90247 USA
Cell Phone: (310) 200-7228

21611 South Perry Street

Local Transportation Assessment

Prepared for:
21611 Perry Street, LLC

January 18, 2022

LB21-0049.00

FEHR PEERS

Table of Contents

Appendices

1. Introduction

This report documents the assumptions, methodologies, and findings of a traffic and parking study conducted by Fehr & Peers to address non-CEQA related transportation needs and potential improvements for the 21611 South Perry Street self-storage/mixed-use project (the "Project") in the City of Carson, California, on a 2.8-acre site located east of the I-405 Freeway interchange with Carson Street.

1.1 Project Description

The Project is proposed to be developed in the City of Carson in the South Bay area of Los Angeles County on a currently vacant lot. It is located approximately 17.5 miles south of downtown Los Angeles and approximately 8.5 miles east of the Pacific Ocean. The Project site is comprised of approximately 2.8 acres located to the east of the I-405 Freeway interchange with Carson Street. The Project site is bounded by a single-family residential neighborhood to the north, a mix of residential and commercial uses to the east, a truck dealership to the south, and the Dominguez Channel to the west. **Figure 1** illustrates the Project site and study area. **Figure 2** includes the site plan.

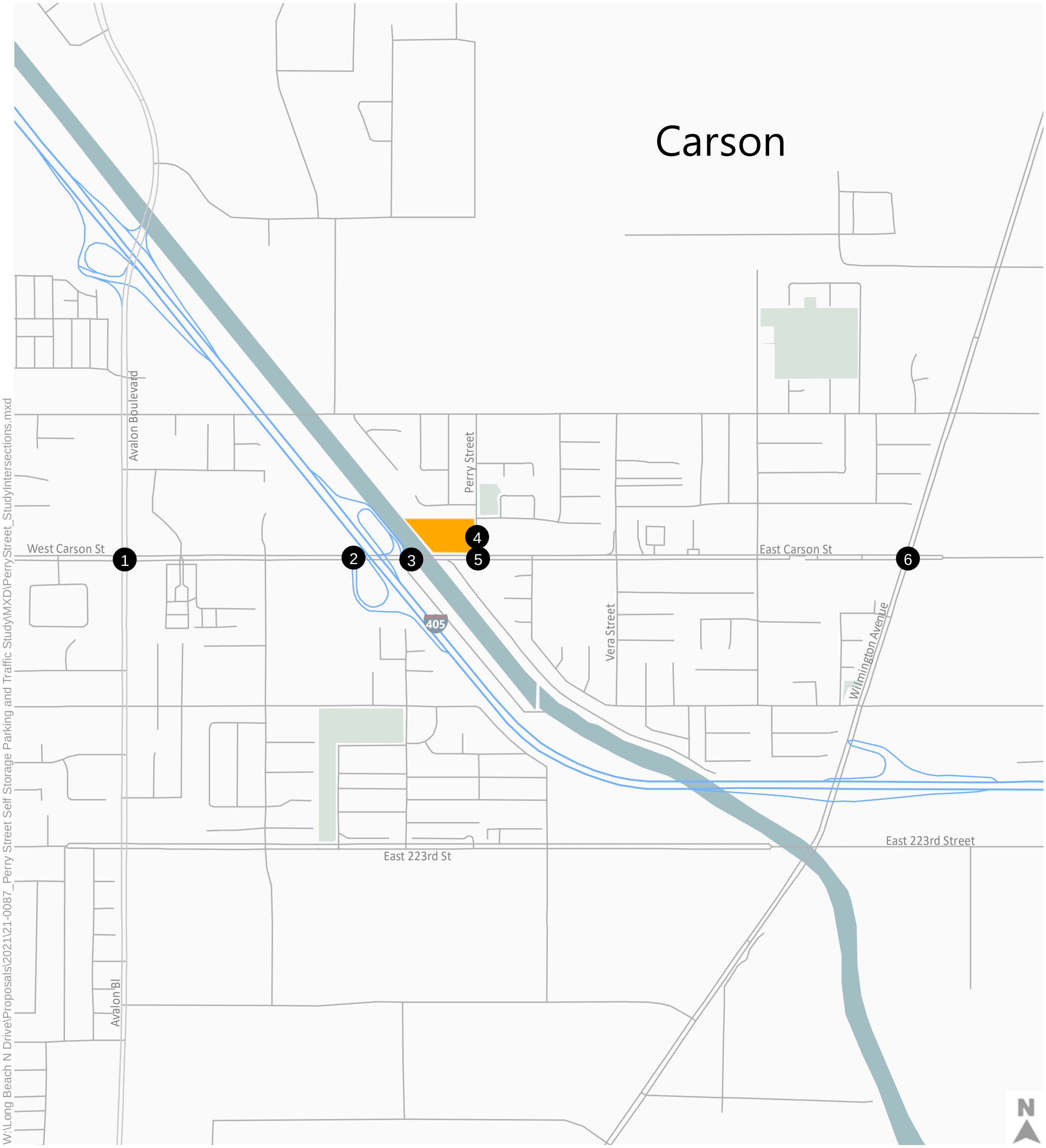
The Project as analyzed in this study involves the construction of:

- 109,039 square feet (725 storage units) of self-storage warehouse space
- 2,425 square feet of self-storage office space
- 700 square feet of retail space
- 1,550 square feet of restaurant space

The Project, as illustrated in the site plan in **Figure 2**, will have side-street stop control access and egress at one driveway location. This Project driveway will provide access to and from Perry Street.

1.2 Study Scope

The scope of work for this study was determined in conjunction with the City of Carson's Transportation staff. The base assumptions and technical methodologies were discussed with the City of Carson as part of the study approach and agreed to in a memorandum of understanding, dated December 13, 2021. This memorandum is included in **Appendix E** of this document.



Cities

Study Intersections

Proposed Project Site

Figure 1

Project Location and Study Intersections

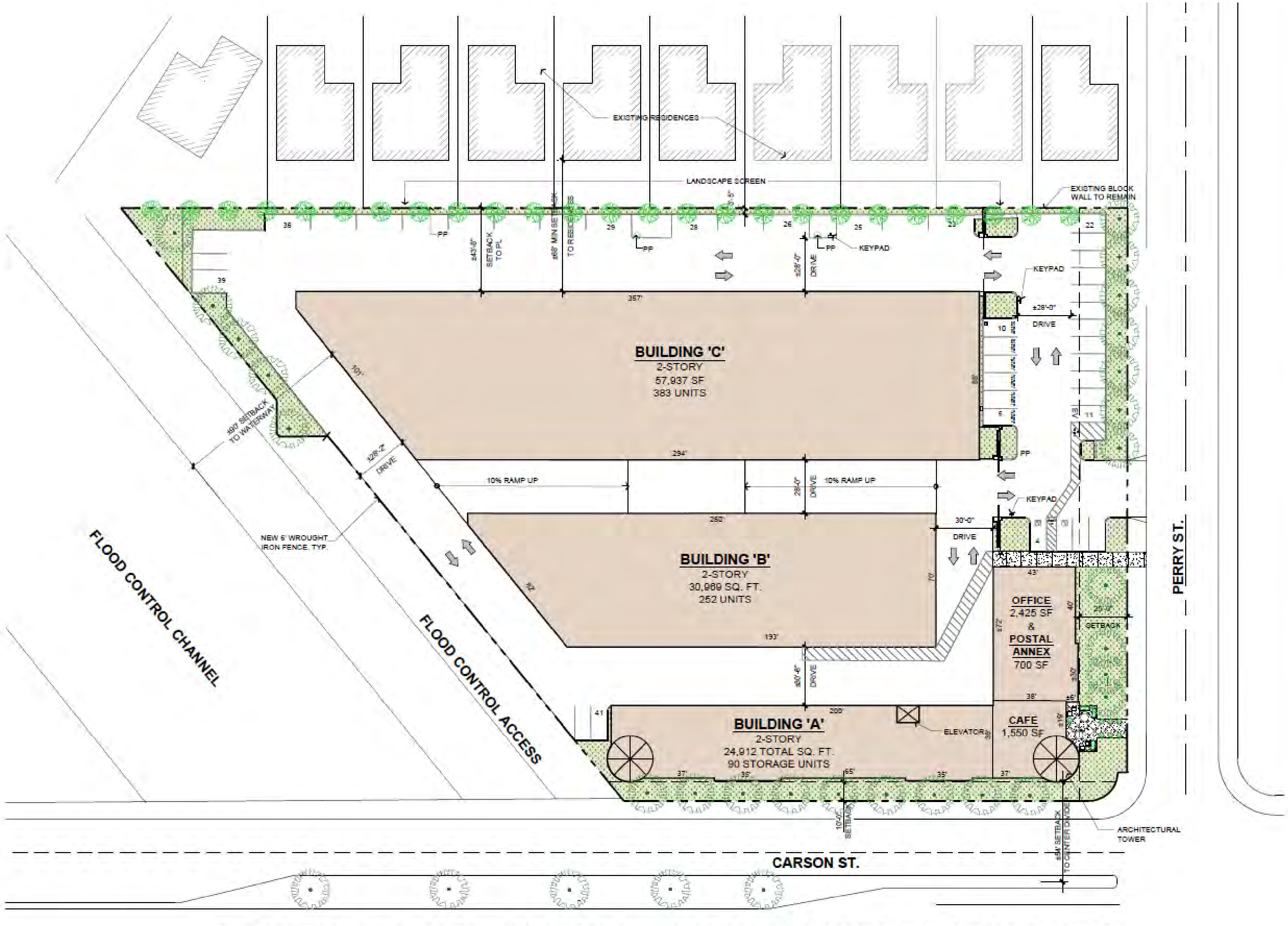


Image Source: Jordan Architects

Figure 2

Site Plan

1.3 Traffic Scenarios

The study assumes that the Project will be completed by year 2023. This study analyzes the potential project-generated traffic effects to the local street system under both existing and future year traffic conditions. The following traffic scenarios have been developed and analyzed as part of this study:

- Existing Conditions – The existing conditions analysis includes a description of the transportation system serving the Project site, existing traffic volumes, and an assessment of the operating conditions at the study analysis locations described below. This scenario is described in detail in **Chapter 2**.
- Existing plus Ambient Growth plus Project Conditions – This traffic scenario provides projected traffic volumes and an assessment of operations under existing conditions with the addition of project-generated traffic and ambient regional growth by the year 2023. The effects of the proposed Project on existing traffic operating conditions were then identified. This scenario is described in detail in **Chapter 3**.
- Future Base (Year 2023) Conditions – Future traffic projections without the proposed Project were developed for the year 2023. The objective of this analysis was to project future traffic growth and operating conditions that could be expected to result from ambient regional growth and related projects in the vicinity of the Project site by the year 2023. This scenario is described in detail in **Chapter 3**.
- Future (Year 2023) plus Project Conditions – This traffic scenario provides projected traffic volumes and an assessment of operating conditions under future conditions with the addition of Project-generated traffic. The effects of the proposed Project on future traffic operating conditions were then identified. This scenario is described in **Chapter 3**.

1.4 Study Intersections

A total of 6 intersections were selected for the analysis of the Project in consultation with the City of Carson. Of the 6 intersections, 4 are signalized intersections and 2 are unsignalized intersections.

1.4.1 Signalized Intersections

The following signalized intersections, illustrated in **Figure 1**, were identified in conjunction with the City of Carson to be analyzed as part of the scope of work for this Project:

1. Avalon Boulevard & Carson Street
2. I-405 Southbound Ramps & Carson Street
3. I-405 Northbound Ramps/Recreation Road & Carson Street
6. Wilmington Avenue & Carson Street

1.4.2 Unsignalized Intersections

The following two unsignalized intersections, illustrated in **Figure 1**, were identified in conjunction with the City of Carson:

4. Perry Street & Project Driveway
5. Perry Street & Carson Street

1.5 Organization of Report

This report is divided into 6 chapters, including this introduction. **Chapter 2** describes the existing conditions including an inventory of the streets, highways, and transit service in the study area, a summary of existing traffic volumes, and an assessment of existing operating conditions. The methodologies used to develop traffic forecasts for the Existing, Existing plus Ambient Growth plus Project, Future Base, and Future plus Project scenarios and the forecasts themselves are included in **Chapter 3**. **Chapter 4** presents an assessment of intersection traffic conditions with the addition of Project trips. **Chapter 5** provides an assessment of the proposed Project's parking and access scheme. **Chapter 6** provides a summary and conclusions.

2. Existing Conditions

A comprehensive data collection effort was conducted to develop a detailed description of existing conditions in the study area. The assessment of conditions includes a description of the study area, an inventory of the local street system, a review of traffic volume on these facilities, an assessment of the resulting operating conditions, and the current transit service in the study area. This chapter presents a detailed description of these elements.

2.1 Study Area

The Project site is located within the City of Carson. The study area selected for analysis is bounded by the State Route 91 freeway to the north, the Harbor Freeway (I-110) to the west, State Route 47 to the east, and 223rd Street to the south. The streets in the study area are under the jurisdiction of the City of Carson, except for all freeway ramp terminal intersections which are controlled by Caltrans.

2.2 Existing Street System

As illustrated in **Figure 1**, the Project site is located just east of the I-405 Freeway interchange with Carson Street. The site is currently a vacant lot. I-405 provides the primary regional access to the Project site.

Major arterials serving the study area include Carson Street in the east/west direction and Avalon Boulevard and Wilmington Avenue in the north/south direction.

The characteristics of the freeways and major roadways serving the study area are described below.

2.2.1 Freeways

- **Interstate 405** runs in a northwest/southeast direction in the study area, extending from I-5 in the City of Irvine to the San Fernando Valley in the City of Los Angeles. In the study area, the freeway provides four lanes and one carpool lane in each direction plus auxiliary lanes. Ramps are provided at Carson Street.

2.2.2 East/West Streets

- **Carson Street** is classified as a Major Highway in the City of Carson's General Plan, Transportation and Infrastructure Element and runs in the east/west direction south of the Project site with two lanes in each direction through most of the study area. Parking is generally permitted on both sides of the street and left-turn pockets are present at major intersections. Carson Street from Figueroa Street to the I-405 interchange was recently improved as part of the Carson Street Mixed-Use District Master Plan, adding pedestrian enhancements including curb bulbouts and high-visibility crosswalks.

2.2.3 North/South Streets

- **Avalon Boulevard** is classified as a Major Highway and runs in the north/south direction west of the Project site with three travel lanes in each direction north of Carson Street and two travel lanes in each direction south of Carson Street. Parking is permitted on the blocks south of Carson Street but not on the blocks north of Carson Street. Left-turn pockets are present at major intersections.
- **Wilmington Avenue** is classified as a Major Highway and runs in the north/south direction east of the Project site with generally two travel lanes in each direction. Parking is generally permitted on both sides of the street and left-turn pockets are present at major intersections.

Lane configurations of the study intersections are provided in **Appendix A**.

2.3 Existing Public Transit Service

The Project site is served by one public transit route, Long Beach Transit Route 4, which provides service to the LA Metro J Line bus rapid transit at Carson Station and the LA Metro A Line light rail at Del Amo Station. Route 4 provides service every 40 minutes on weekdays and Saturdays.

2.4 Existing Bicycle and Pedestrian Facilities

Figure 3 shows existing bicycle facilities in the study area. As shown in the figure, the study area has a limited existing bikeway network. Carson Street is now designated as a Class III bike route west of I-405 as part of the recent street improvements. The study area generally has a network of 4- to 8-foot-wide sidewalks but does not have crosswalks on all intersection legs and countdown pedestrian signals at all marked crossings.

There are several bike lanes and bike routes planned throughout the study area as well as a planned extension of the bike path along the Dominguez Channel, east of I-405. Proposed bicycle facilities are also shown in **Figure 4**. Data on the proposed facilities come from two sources: the City of Carson Master Plan of Bikeways and Metro's Active Transportation Strategic Plan.

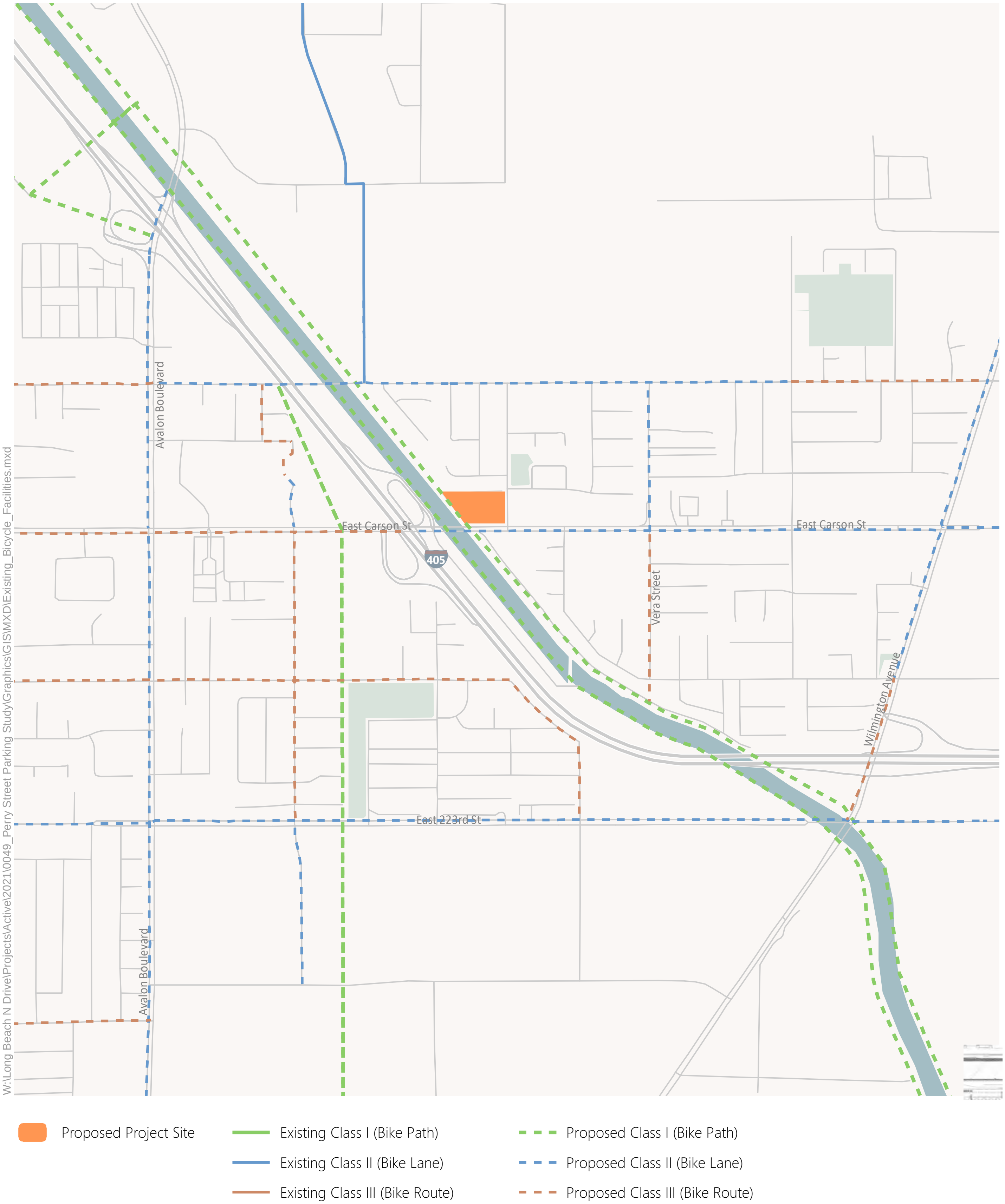


Figure 3

Existing and Proposed Bicycle Facilities

2.5 Existing Traffic Volumes and Level of Service

This section presents existing peak hour traffic volumes, describes the methodology used to assess traffic conditions at each intersection, and analyzes the resulting operating conditions at each location, indicating average vehicle delay and levels of service (LOS).

2.5.1 Existing Traffic Volumes

Due to significant changes in travel behavior caused by the COVID-19 pandemic, this study utilized AM and PM peak hour traffic counts collected in the year prior to the start of the pandemic (March 2019-March 2020). Since pre-pandemic traffic counts were not available for Intersection 5 – Perry Street & Carson Street, new traffic counts were collected at this location on Thursday, December 9, 2021. Adjustment factors were then applied to the new traffic counts to estimate pre-pandemic traffic levels. These adjustment factors were derived by comparing the pre-pandemic counts at nearby intersections with the new counts. Specifically, traffic heading towards the I-405 Freeway in the AM peak hour was increased by approximately 30% and traffic heading away from the I-405 Freeway in the PM peak hour was increased by approximately 20%. The existing weekday morning and evening peak hour volumes at the study intersections, and the adjustment factor volumes, are provided in **Appendix A**. Signal timing plans for the signalized study intersections are provided in **Appendix B**. Traffic count worksheets for the study intersections are contained in **Appendix C**.

2.5.2 Level of Service Methodology

Per the City of Carson guidelines, study intersections are analyzed using the Highway Capacity Manual (HCM), 6th Edition method. The HCM method estimates the average vehicle delay at each intersection based on key parameters including traffic volume, signal timing, and roadway geometry. The overall intersection delay per vehicle is subsequently assigned a LOS value to describe intersection operations, as shown in **Table 1**. LOS ranges from LOS A (free flow) to LOS F (gridlock condition).

The two unsignalized study intersections (Intersections 4 and 5) are both side-street stop-controlled, and the LOS for these intersections is based on the worst operating stop-controlled approach.[1] **Table 1** also shows the LOS values assigned based on stop-controlled approach delay per vehicle for unsignalized intersections using the HCM method.

2.5.3 Existing 2019 Levels of Service

Existing year traffic volumes, presented in **Appendix A**, were analyzed using the methodologies described above to determine the existing operating conditions at the study intersections. **Table 2** summarizes the resulting seconds of delay per vehicle and the corresponding LOS at each of the analyzed intersections.

[1] The analysis for Intersection 5 includes southern approach volumes for reference. The southern approach is the private driveway for a truck dealer facility. Since the southern approach is a private driveway with low traffic volumes in all scenarios, the LOS reported for this intersection is based on the delay for the northern approach.

All existing study intersections operate at LOS D or better during both peak periods. Detailed LOS analysis sheets for the Project are provided in **Appendix D**.

Table 1: HCM Level of Service Definitions

LOS	Description for Signalized Intersections	Signalized Delay (Seconds)	Unsignalized Delay (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10.0	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0	> 10.0 to 15.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0	> 15.0 to 25.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0	> 25.0 to 35.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0	> 35.0 to 50.0
F	Operations with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0	> 50.0

Source: *Highway Capacity Manual, 6th Edition* (Transportation Research Board, 2016).

Table 2: Existing Levels of Service

Study Intersection	Control Type	Period	Delay (s)	LOS
1. Avalon Boulevard & Carson Street	Signalized	AM	39.9	D
		PM	51.2	D
2. I-405 SB Ramps & Carson Street	Signalized	AM	9.4	A
		PM	10.2	B
3. I-405 NB Ramps & Carson Street	Signalized	AM	7.5	A
		PM	8.1	A
4. Perry Street & Project Driveway	TWSC [1]	AM	Project Only Scenarios	
		PM		
5. Perry Street & Carson Street	TWSC	AM	18.3	C
		PM	19.0	C
6. Wilmington Avenue & Carson Street	Signalized	AM	28.2	C
		PM	26.0	C

[1] TWSC = Two-Way Stop-Controlled
Source: Fehr & Peers.

3. Traffic Projections

3.1 Project Traffic

The development of trip generation estimates for the proposed Project involves the use of a 3-step process: trip generation, trip distribution, and traffic assignment.

3.1.1 Project Trip Generation

As indicated in Chapter 1, the proposed Project uses include 109,039 square feet (or 725 storage units) of self-storage warehouse space, 2,425 square feet of self-storage office space, 700 square feet of retail space, and 1,550 square feet of restaurant space.

Trip generation rates from *Trip Generation, 11th Edition* (Institute of Transportation Engineers [ITE], 2021) were used to estimate the number of trips associated with the Project and are presented in **Table 3**. As described below, reductions were applied to the standard ITE rates to account for pass-by trips. The standard ITE rates reflect land uses within a suburban, auto-oriented environment. To be conservative, this analysis does not include trip reductions for walking, biking and transit use beyond the levels found in a typical suburban environment.

Pass-by credits account for patrons making an intermediate stop on the way from an origin to a primary trip destination without a route diversion. A typical pass-by trip is a retail destination that people may visit on the way home from work. These trips would be attracted from traffic passing the site on nearby streets. The City of Carson does not have standard pass-by credit guidelines. Instead, pass-by credits were informed by the ITE *Trip Generation Handbook*.

As shown in **Table 3**, the Project will generate an estimate net increase of 580 daily trips, including 93 trips (49 inbound/44 outbound) during the AM peak hour and 45 trips (22 inbound/23 outbound) during the PM peak hour.

3.1.2 Project Traffic Distribution

The geographic distribution of traffic generated by the proposed Project depends on several factors. These include the type and density of the proposed land uses, the geographic distribution of population and employment centers from the patrons and employees of the Project may be drawn, and the location of the Project's driveway access in relation to the surrounding street system. Considering these factors, trip distribution patterns were developed according to the nature of the land uses and the corresponding percentage of traffic likely to use the freeway versus the local street system to access the Project site. **Figure 4** illustrates the distribution pattern for the Project.

TABLE 3
PERRY STREET SELF-STORAGE PROJECT
ESTIMATED PROJECT TRIP GENERATION

Land Use	ITE Land Use Code	Size	Trip Generation Rates [a]							Estimated Trip Generation						
				AM Peak Hour			PM Peak Hour				AM Peak Hour Trips			PM Peak Hour Trips		
			Daily	Rate	In%	Out%	Rate	In%	Out%	Daily	In	Out	Total	In	Out	Total
PROPOSED PROJECT																
Mini-Warehouse	151	7.25 Units (100s) [b]	17.96	1.21	51%	49%	1.68	50%	50%	130	5	4	9	6	6	12
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [c]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net External Vehicle Trips										130	5	4	9	6	6	12
Coffee/Donut Shop without Drive-Through Window [d]	936	1.55 KSF	450.49	93.08	51%	49%	32.29	50%	50%	698	73	71	144	25	25	50
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [c]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Driveway Trips										698	73	71	144	25	25	50
Less: Pass-by			*43%*	*43%*			*43%*			*(300)*	*(31)*	*(31)*	*(62)*	*(11)*	*(11)*	*(22)*
Net External Vehicle Trips										398	42	40	82	14	14	28
Copy, Print, and Express Ship Store [e]	920	0.7 KSF	74.2	2.78	75%	25%	7.42	44%	56%	52	2	0	2	2	3	5
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [c]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Driveway Trips										52	2	0	2	2	3	5
Less: Pass-by			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net External Vehicle Trips										52	2	0	2	2	3	5
TOTAL DRIVEWAY TRIPS										880	80	75	155	33	34	67
TOTAL PROJECT EXTERNAL VEHICLE TRIPS										580	49	44	93	22	23	45
EXISTING USE CREDIT																
Vacant Lot	-		-	-	-	-	-	-	-	0	0	0	0	0	0	0
TOTAL EXISTING DRIVEWAY TRIPS										0	0	0	0	0	0	0
NET INCREMENTAL EXTERNAL TRIPS										580	49	44	93	22	23	45

Notes:

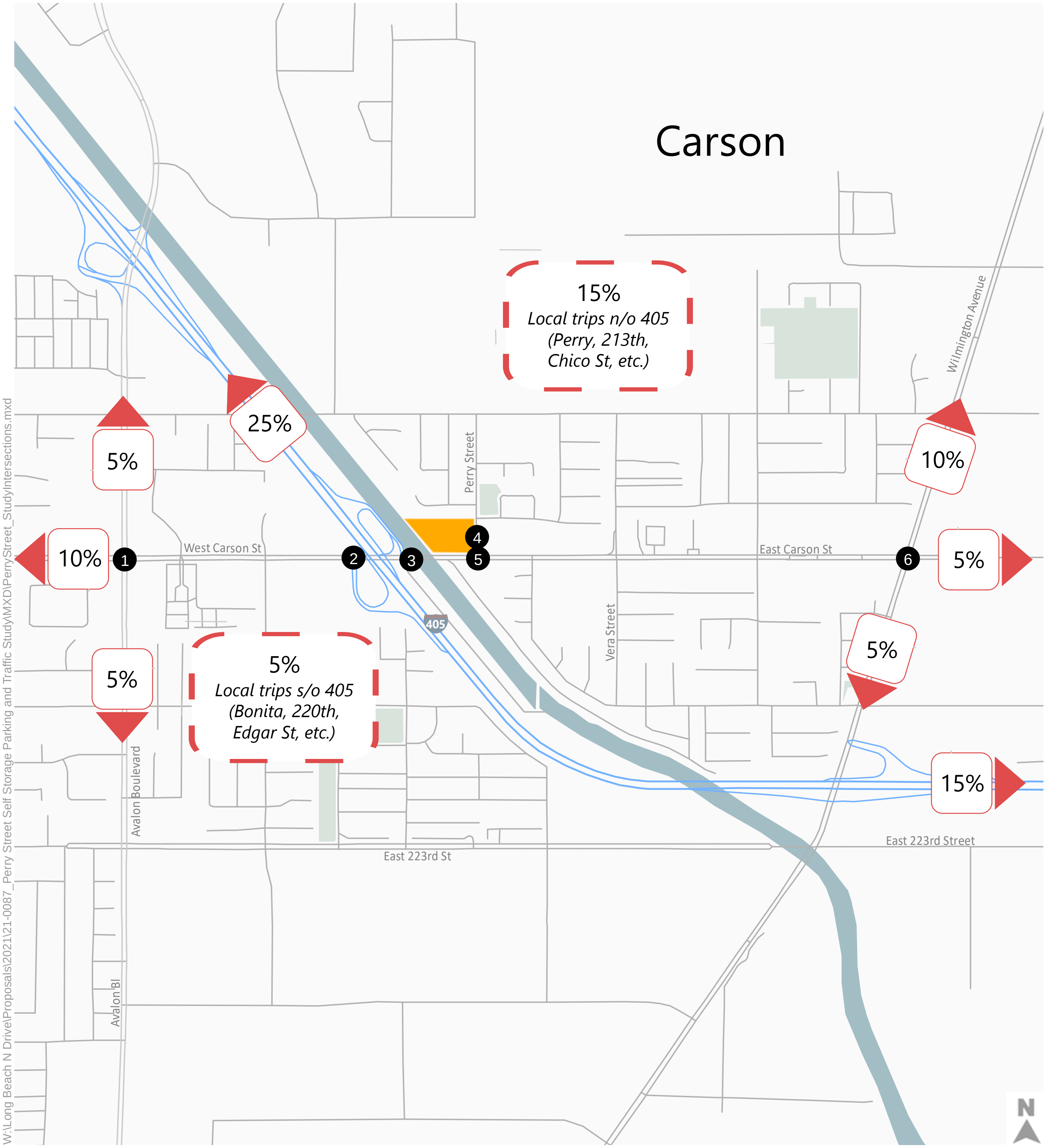
[a] Source: Institute of Transportation Engineers (ITE), *Trip Generation, 11th Edition* , 2021

[b] The independent variable used to estimate trip generation for the self-storage use is total number of storage units. Trip generation for the self-storage office space is considered to be inclusive, per the ITE approach.

[c] A 0% Walk/Bike/Transit Credit was used based on the site's general suburban context.

[d] ITE use 933 - Fast-Food Restaurant without Drive-Through Window used for daily rate due to lack of daily rate data for ITE use 936 - Coffee/Donut Shop without Drive-Through Window.

[e] ITE use 920 does not have a daily rate. The daily rate is estimated to be 10 times greater than the PM peak hour traffic volume for the use.



Cities
Study Intersections
Proposed Project Site
Local Trip Distribution
Trip Distribution

Figure 4

Project Trip Distribution

3.1.3 Project Traffic Assignment

The traffic expected to be generated by the proposed Project was assigned to the street network using the distribution patterns illustrated in **Figure 4**. **Appendix A** shows the assignment of Project-only traffic volumes for the morning and evening peak hours at the 6 analyzed intersection locations.

3.2 Existing Plus Ambient Growth Plus Project Traffic Conditions

Based on historic trends and at the direction of the City of Carson, it was established that an ambient growth factor of 0.5% per year should be applied to adjust the existing base year traffic volumes to reflect the effects of regional growth and development by year 2023. This growth factor was applied to the 2019 traffic volume data to reflect the effect of ambient growth by the year 2023.

The Project traffic estimated and assigned to the study intersections was added to the existing traffic volumes along with the regional ambient traffic growth to estimate Existing plus Ambient Growth plus Project traffic volumes. Turning movement traffic volumes for the Existing plus Ambient Growth plus Project scenario are provided in **Appendix A**. Analysis sheets are provided in **Appendix D**.

3.3 Future Year 2023 Traffic Conditions

To evaluate the potential effects of the proposed Project on future (Year 2023) conditions, it was necessary to develop estimates of future traffic conditions in the area both with and without Project traffic. First, estimates of traffic growth were developed for the study area to forecast future conditions without the Project. These forecasts included traffic increases due to both regional ambient traffic growth and traffic generated by specific developments in the vicinity of the Project (related projects). Including both ambient growth and trips from specific projects proposed within the vicinity of the Project provides a conservative estimate of future traffic projections.

These projected traffic volumes, identified herein as the Future Base conditions, represent the future conditions without the proposed Project.

3.3.1 Related Project Traffic Generation and Assignment

Future Base traffic forecasts include the effects of known specific projects, called related projects, expected to be implemented in the vicinity of the proposed Project. A list of related projects was prepared based on data from the City of Carson. A total of 25 related projects were identified in the study area; these projects are listed in **Table 4** and illustrated in **Figure 5**.

3.3.1.1 Trip Generation

Trip generation estimates for the related projects were calculated using a combination of previous study findings, publicly available environmental documentation, and trip generation rates contained in *Trip*

Generation, 10th Edition.[2] **Table 4** presents the resulting trip generation estimates for these related projects. These trip generation projections are conservative in that they do not in every case account for either the existing uses to be removed or the possible use of walking, biking and transit. Traffic mitigation measures associated with the related projects are not considered in order to conduct a more conservative analysis.

3.3.1.2 Trip Distribution

The geographic distribution of the traffic generated by the related projects is dependent on several factors. These factors include the type and density of the proposed land uses, the geographic distribution of population from which employees and potential patrons of proposed commercial developments may be drawn, the locations of employment and commercial centers to which residents of residential projects may be drawn, and the location of the projects in relation to the surrounding street system. Additionally, if the traffic study or environmental document for a related project was available, the trip distribution from that study was considered.

Using the estimated trip generation and trip distribution patterns described above, traffic generated by the related projects was assigned to the street network.

3.3.2 Future Year 2023 Base Traffic Volumes

Future (Year 2023) Base weekday AM and PM peak hour traffic volumes and lane geometries for the analyzed intersections are provided in **Appendix A**. The Future Base traffic conditions represent an estimate of future conditions without the proposed Project inclusive of the regional ambient growth and related projects traffic.

3.4 Future Plus Project Traffic Projections

The proposed Project traffic volumes were added to the Future (Year 2023) Base traffic projections, resulting in Future (Year 2023) plus Project AM and PM peak hour traffic volumes. The Future (Year 2023) plus Project scenario represents future traffic conditions with the completion of the proposed Project. **Appendix A** shows the lane configurations and volumes analyzed as part of the Future plus Project scenario.

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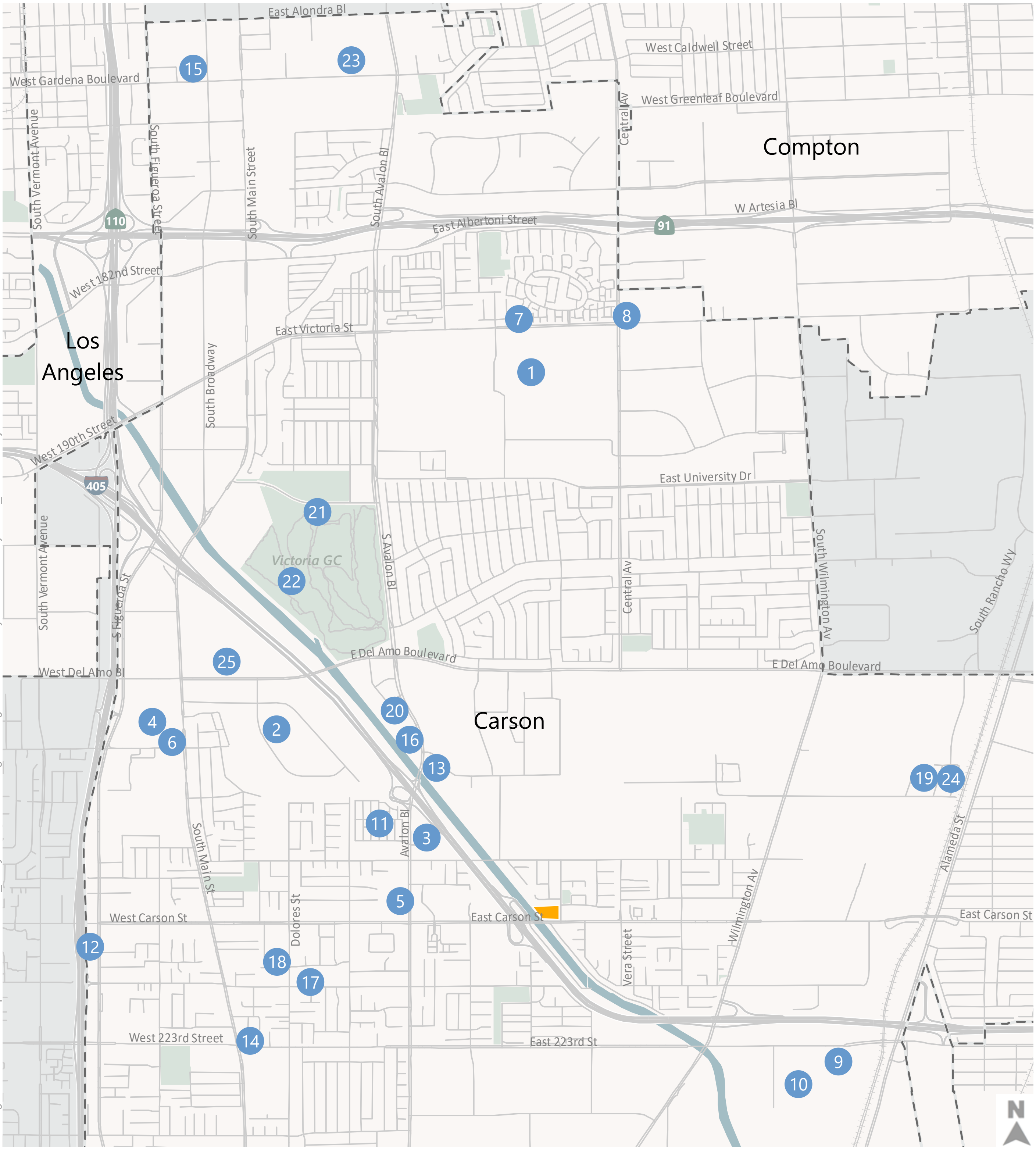
[2] Trip generation estimates for related projects, along with previous study findings and publicly available environmental documentation, were conducted prior to the issuance of *Trip Generation, 11th Edition*.

TABLE 4
PERRY STREET SELF STORAGE PROJECT
RELATED PROJECTS

No.	Project Location	Land Use	Size		Trip Generation						
					Daily	AM			PM		
						IN	OUT	TOTAL	IN	OUT	TOTAL
1	CSUDH Master Plan	Mixed Use	[1]	[1]	N/A	2,299	1,415	3,714	1,940	2,286	4,226
2	The District at South Bay	Mixed Use	[1]	[1]	42,791	1,490	1,349	2,838	1,809	1,997	3,805
3	21212 Avalon Blvd	Mixed Use	[1]	[1]	9,779	171	347	518	391	268	659
4	20601 S Main St	Industrial Park	267	ksf	900	87	20	107	22	85	107
5	Union South Bay (21521 S Avalon Blvd)	Multifamily	357	du	3,685	54	156	210	199	137	335
		Shopping	31	ksf							
6	225 W Torrance Blvd	Multifamily	356	du	1,937	33	95	128	96	61	157
7	1007 E Victoria St	Multifamily	35	du	278	4	13	17	13	8	21
8	NEC Victoria and Central	Multifamily	175	du	1,281	19	62	81	62	36	98
9	2254 E 223rd St	Warehousing	121	ksf	429	29	8	36	10	29	39
10	2112 E 223rd St	Warehousing	292	ksf	507	38	12	50	14	41	55
11	21207 Avalon Blvd	Mixed Use	[1]	[1]	5,586	125	277	402	283	174	457
12	21809-21811 S Figueroa St	Multifamily	32	du	234	3	11	14	11	7	18
13	888 E Dominguez St	Hotel	118	keys	905	32	22	54	36	35	71
14	123 E 223rd st	Multifamily	10	du	36	2	1	3	1	2	3
15	333 W Gardena Blvd	Warehousing	146	ksf	276	19	6	25	7	21	28
16	20707 Avalon Blvd	Retail	3	ksf	608	26	26	52	22	20	42
17	345/349 E 220th St	Multifamily	35	du	256	4	12	16	12	7	19
18	21915 S Dolores St	Multifamily	5	du	37	1	2	3	2	2	4
19	2315 E Dominguez St	Warehousing	14	ksf	68	1	1	2	1	2	3
20	20501 Avalon Blvd	Retail	5	ksf	1,013	44	43	86	37	34	70
21	Carol Kimmelman Campus	Mixed Use	[1]	[1]	3,808	105	83	188	244	192	436
22	Creek Dominguez Hills	Mixed Use	[1]	[1]	16,132	580	384	964	727	669	1,396
23	439 E Gardena Blvd	Warehousing	4	ksf	52	1	0	1	0	1	1
24	20950 Brant Ave	Retail	4	ksf	151	2	2	4	7	8	15
25	20330 S Main St	Multifamily	300	du	1,580	27	109	136	84	45	129
				Total	92,329	5,196	4,456	9,649	6,030	6,167	12,194

Notes:
du = dwelling unit
ksf = one thousand square feet
[1] Mixed Use developments contain more than one independent variable to calculate trip generation.
Related projects list is based on information provided by the City of Carson, the County of Los Angeles, publicly available environmental documentation, and trip generation rates contained in ITE Trip Generation, 10th Edition.



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Proposed Project Site

Cities

Related Projects

Figure 5

Related Projects

4. Intersection Traffic Analysis

The intersection traffic analysis evaluates the projected LOS at each study intersection under the Existing plus Ambient Growth plus Project and Future (Year 2023) plus Project conditions to estimate the incremental increase in seconds of delay per vehicle expected to be caused by the proposed Project.

4.1 Existing Plus Ambient Growth Plus Project Analysis

4.1.1 Existing Plus Ambient Growth Plus Project Traffic Level of Service

The Existing plus Ambient Growth plus Project traffic volumes presented in **Appendix A** were analyzed to determine the projected delay per vehicle and LOS for each of the study intersections. **Table 5** summarizes the Existing plus Ambient Growth plus Project LOS. Analysis sheets are provided in **Appendix D**. As shown in **Table 5**, all study intersections are projected to operate at LOS D or better during both morning and evening peak hours under Existing plus Ambient Growth plus Project conditions.

4.2 Future Plus Project Analysis

4.2.1 Future Base Traffic Level of Service

The Future (Year 2023) Base peak hour traffic volumes were analyzed to determine the projected seconds of delay per vehicle and LOS for each of the study intersections. **Table 6** summarizes the future LOS at each intersection. Five of the 6 study intersections are projected to operate at LOS D or better during the morning and evening peak hours under Future Base conditions.

The following study intersection is projected to operate at LOS E under Future Base conditions:

1. Avalon Boulevard & Carson Street (AM & PM Peak Hours)

Detailed LOS analysis sheets for the Future Base scenario are provided in **Appendix D**.

4.2.2 Future Plus Project Traffic Level of Service

The Future (Year 2023) plus Project peak hour traffic volumes, provided in **Appendix A**, were analyzed to determine the projected future operating conditions with the addition of the proposed Project traffic. The results of the Future (Year 2023) plus Project analysis are also presented in **Table 6**, with analysis sheets provided in **Appendix D**. Five of the 6 study intersections are projected to operate at LOS D or better during the morning and evening peak hours under Future plus Project conditions.

The following study intersection is projected to operate at LOS E under Future plus Project conditions:

1. Avalon Boulevard & Carson Street (AM & PM Peak Hours)

Table 5: Existing Plus Ambient Growth Plus Project Levels of Service

Study Intersection	Period	Existing		Existing + Ambient + Project	
		Delay (s)	LOS	Delay (s)	LOS
1. Avalon Boulevard & Carson Street	AM	39.9	D	42.3	D
	PM	51.2	D	53.6	D
2. I-405 SB Ramps & Carson Street	AM	9.4	A	9.9	A
	PM	10.2	B	10.7	B
3. I-405 NB Ramps & Carson Street	AM	7.5	A	7.7	A
	PM	8.1	A	8.2	A
4. Perry Street & Project Driveway	AM	Project Only Scenario		9.5	A
	PM			9.4	A
5. Perry Street & Carson Street	AM	18.3	C	24.5	C
	PM	19.0	C	19.6	C
6. Wilmington Avenue & Carson Street	AM	28.2	C	29.5	C
	PM	26.0	C	26.8	C

Source: Fehr & Peers.

Table 6: Future Base and Future Plus Project Levels of Service

Study Intersection	Period	Future Base		Future + Project	
		Delay (s)	LOS	Delay (s)	LOS
1. Avalon Boulevard & Carson Street	AM	**59.1**	**E**	**59.8**	**E**
	PM	**79.0**	**E**	**79.4**	**E**
2. I-405 SB Ramps & Carson Street	AM	9.5	A	9.9	A
	PM	11.3	B	11.4	B
3. I-405 NB Ramps & Carson Street	AM	7.7	A	7.9	A
	PM	8.1	A	8.2	A
4. Perry Street & Project Driveway	AM	Project Only Scenario		9.5	A
	PM			9.4	A
5. Perry Street & Carson Street	AM	21.8	C	31.6	D
	PM	27.2	D	31.3	D
6. Wilmington Avenue & Carson Street	AM	29.8	C	30.2	C
	PM	29.4	C	29.5	C

Source: Fehr & Peers.

5. Site Access Analysis

5.1 Project Driveway

The Project will provide direct access to and from Perry Street from a new driveway between 216th Street and Carson Street. The project driveway approach will be stop-controlled. This driveway is included in the LOS analysis portion of this study as Intersection 4. **Figure 2** shows the site plan and Project driveway access.

5.2 Queuing Analysis

A queueing analysis was performed for all study intersections and all traffic volume scenarios to determine if the addition of Project traffic causes potential safety issues related to spill over queues. Study intersections are considered adversely affected if the Project's traffic contributes to unacceptable queuing, defined as:

- Spill over from turn pockets into through lanes
- Spill over into intersections

This analysis utilized the *HCM, 6th Edition* methodology to calculate the 95th percentile queue lengths for each left-turn pocket of each study intersection. Additionally, the 95th percentile queue length for the northbound left-turn movement into the Project site from Perry Street was measured. **Table 7** presents a summary of the left-turn pocket queuing analysis for Existing, Existing plus Ambient Growth plus Project, Future (Year 2023) Base, and Future (Year 2023) plus Project scenarios. As shown in **Table 7**, although several queues exceed the turn pocket storage length, these issues occur even without the addition of Project trips. Also, Project traffic is never estimated to add more than one vehicle to any queue length. These findings suggest that the addition of Project traffic will not cause any new potential safety issues related to spill over queuing. Detailed analysis sheets for each study intersection are provided in **Appendix D**.

Table 7: Study Intersection Left-Turn Pocket Queuing

Study Intersection	Direction	Storage Length (ft)	Period	Existing	Existing Ambient Project	Future Base	Future Project	Unacceptable?
1. Avalon Boulevard & Carson Street	SBL	145	AM	200	200	500	500	NO
			PM	375	400	725	725	NO
	WBL	210	AM	250	275	275	275	NO
			PM	250	275	250	275	NO
	NBL	140	AM	150	150	150	150	NO
			PM	150	150	200	200	NO
	EBL	225	AM	125	125	150	150	NO
			PM	125	125	200	200	NO
2. I-405 SB Ramps & Carson Street	WBL	55	AM	100	100	75	100	NO
			PM	75	100	75	100	NO
	EBL	45	AM	25	25	25	25	NO
			PM	25	25	25	25	NO
	Off-Ramp	1,130	AM	75	75	75	75	NO
			PM	25	50	50	50	NO
3. I-405 NB Ramps & Carson Street	WBL	100	AM	25	25	25	25	NO
			PM	50	50	50	50	NO
	EBL	70	AM	125	150	150	150	NO
			PM	175	175	150	150	NO
	Off-Ramp	1,220	AM	50	50	50	50	NO
			PM	75	75	75	75	NO
4. Perry Street & Project Driveway	NBL	150	AM	Project Only Scenario	25	Project Only Scenario	25	NO
			PM		0		0	NO
5. Perry Street & Carson Street	WBL	75	AM	0	0	0	0	NO
			PM	0	0	0	0	NO
	EBL	100	AM	25	25	25	25	NO
			PM	25	25	25	25	NO
6. Wilmington Avenue & Carson Street	SBL	210	AM	200	200	225	225	NO
			PM	400	425	425	425	NO
	WBL	195	AM	125	125	125	125	NO
			PM	100	100	100	100	NO
	NBL	295	AM	100	125	125	125	NO
			PM	150	150	150	150	NO
	EBL	195	AM	250	275	275	300	NO
			PM	175	175	175	175	NO

Source: Fehr & Peers.

5.3 Parking Demand Analysis

The Project site plans to provide 41 total parking spaces to serve the on-site uses. Of the 41 total parking spaces, 19 are designated for the self-storage use and are located within a controlled-access gated area. Only customers and employees of the self-storage facility will have access to these spaces. The remaining 22 spaces are available to serve all on-site users, including customers and employees of the retail and restaurant uses and prospective customers for the self-storage use.

5.3.1 Municipal Code Required Parking

The Carson Municipal Code includes minimum off-street parking ratios as a general requirement for new developments within the City[3]. **Table 8** shows the code parking requirements for the proposed Project land uses. As shown in the table, if the code were applied, the parking requirement would be 65 – or 24 more spaces than proposed. Therefore, the proposed parking supply would not meet the minimum code requirement for off-street parking.

Table 8: Carson Municipal Code Parking Requirements

Land Use	Parking Ratio	Size	Parking Spaces
Self-Storage	1 space per 20 units of storage area	725 units	36
	1 space per 300 SF of office area	2,425 SF	8
Restaurant	1 space per 100 SF	1,550 SF	16
Retail	1 space per 300 SF (Minimum of 5 spaces)	700 SF	5
		Total	**65**

Source: City of Carson, Fehr & Peers.

5.3.2 ITE Parking Generation Rates

The Institute of Transportation Engineers (ITE) maintains an informational report, *Parking Generation*, based on parking demand studies submitted to ITE by public agencies; consulting firms (including Fehr & Peers); universities and colleges; developers; associations; and local sections, districts, and student chapters of ITE. The data in the report is periodically updated, and is currently in its fifth edition, published in 2019[4]. Included in this report is empirically collected hourly parking demand count data from a variety of uses in the U.S. and Canada.

Based on the compiled parking data, peak period parking demand can be estimated at similar facilities using independent variables specified in the ITE report and either fitted curve or average demand rates. To evaluate the number of spaces needed at the proposed Project, this analysis uses the gross floor area

[3] *Carson Municipal Code, Section 9162.21,* City of Carson, 2022
[4] *Parking Generation, Fifth Edition,* Institute of Transportation Engineers, Washington D.C., 2019

from the proposed Project site and the demand rates from the ITE report to estimate peak period parking demand.

Table 9 provides a summary of estimated peak parking demand using the data from the ITE report. As shown in **Table 9**, the estimated peak parking demand for the proposed project using the ITE method is 29 spaces. This finding suggests that the 41 parking spaces proposed for the project will be more than adequate to accommodate peak parking demand for the Project.

Table 9: Peak Parking Demand Estimate – ITE Method

ITE Land Use Code	Equation [2]	Project Size	Project Demand
151 – Mini-Warehouse [1]	P = 0.1x	111,464 SF	11
936 – Coffee/Donut Shop without Drive-Through Window	P = 10.49x	1,550 SF	16
920 – Copy, Print, and Express Ship Store	P = 3.01x	700 SF	2
		Total	**29**

[1] The ITE report specifies Mini-Warehouse to be "typically referred to as 'self-storage' facilities."
[2] P = Parked Vehicles, x = 1,000 square feet increments of gross floor area.
Source: Fehr & Peers.

6. Summary and Conclusions

The following summarizes the results of the Project's traffic and parking study analysis:

- The Project consists of the proposed construction of 109,039 square feet (or 725 storage units) of self-storage warehouse space, 2,425 square feet of self-storage office space, 700 square feet of retail space, and 1,550 square feet of restaurant space.

- The site on which the Project will be developed is comprised of approximately 2.8 acres located to the east of the I-405 Freeway interchange with Carson Street. The Project proposes to provide side-street stop-controlled vehicular ingress and egress at one location: along Perry Street midblock between Carson Street and 216th Street.

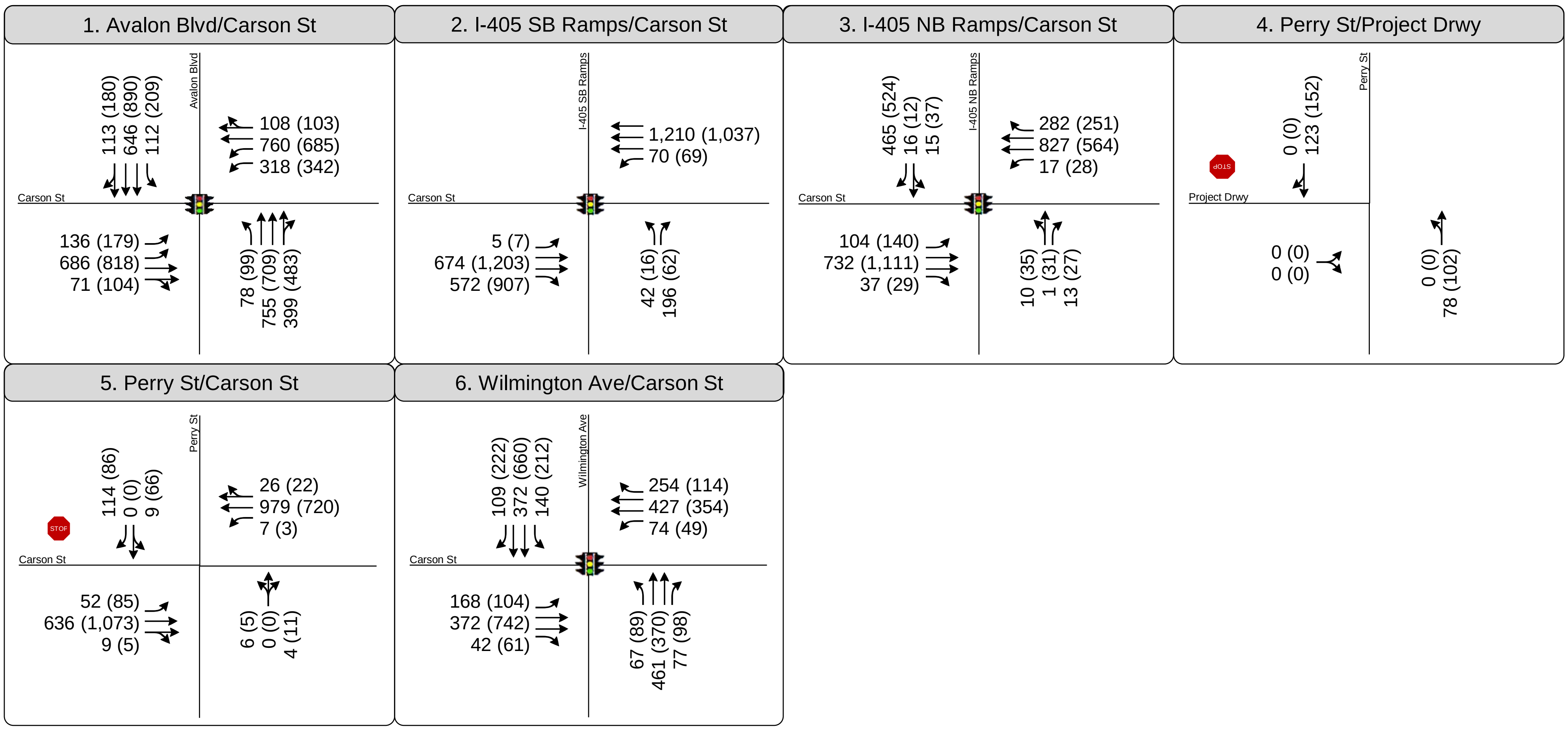
- The Project is expected to generate approximately 580 net new daily trips, 93 net new trips during the AM peak hour, and 45 net new trips during the PM peak hour.

- The addition of Project trips does not cause average vehicle delay at any study intersection to worsen from LOS D or better to LOS E or F.

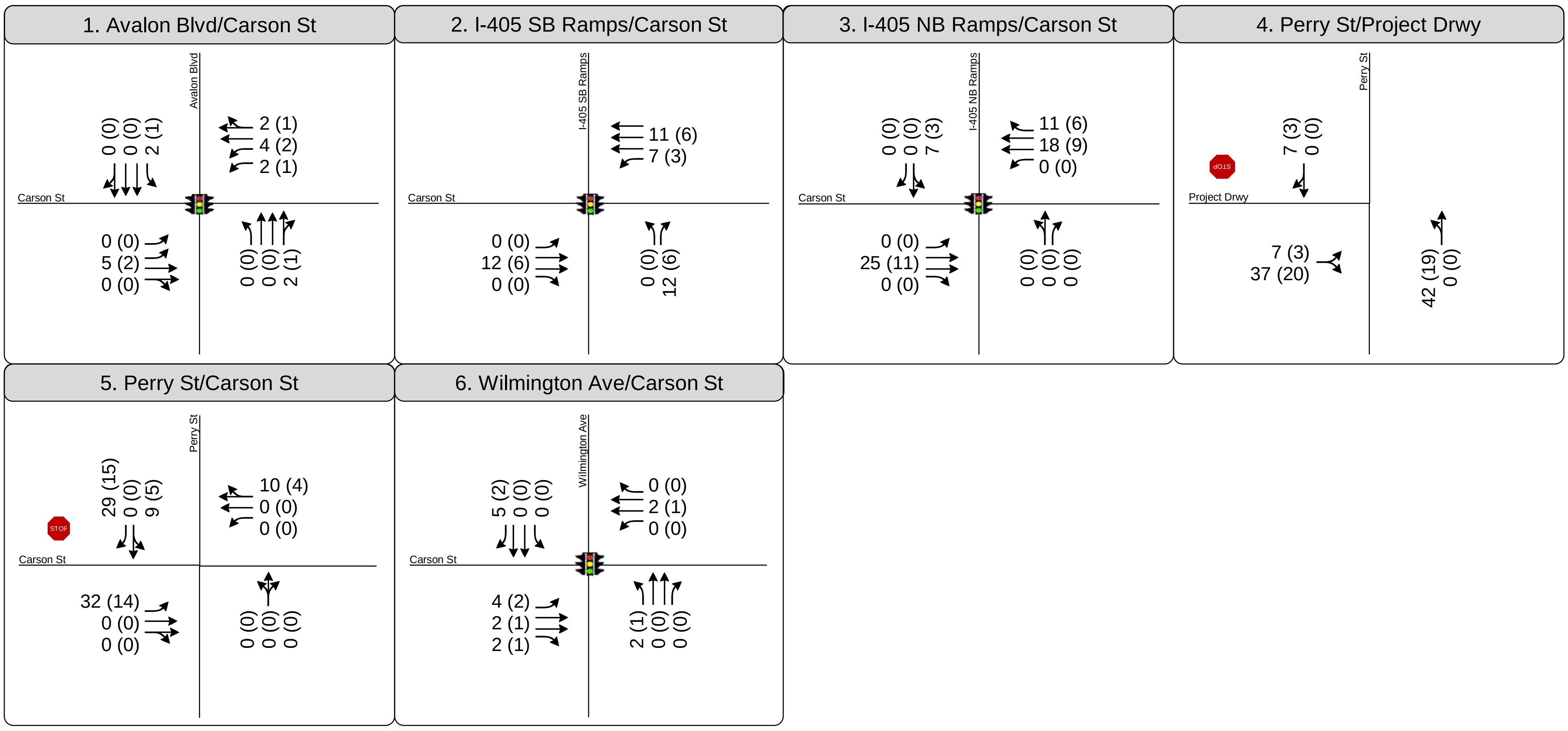
- The addition of Project trips does not cause spill over queuing at any study intersection. At intersections already experiencing spill over queueing without Project trips, the addition of Project trips increases the queue by no more than one vehicle at any study intersection approach.

- Using the ITE method for estimating parking demand, the proposed on-site parking supply of 41 spaces is more than adequate to accommodate the estimated peak parking demand of 29 spaces.

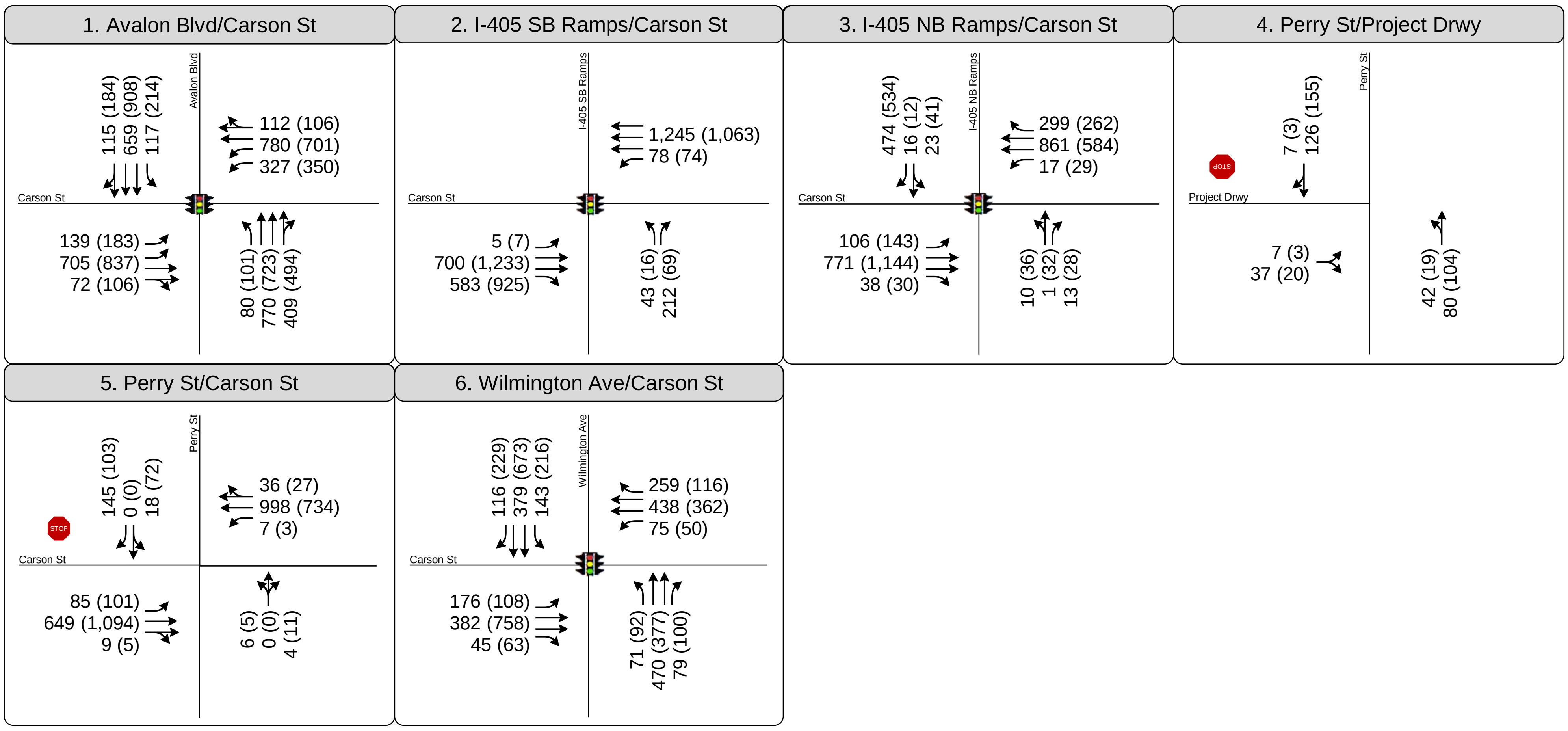
APPENDIX A: LANE CONFIGURATIONS AND TRAFFIC VOLUMES



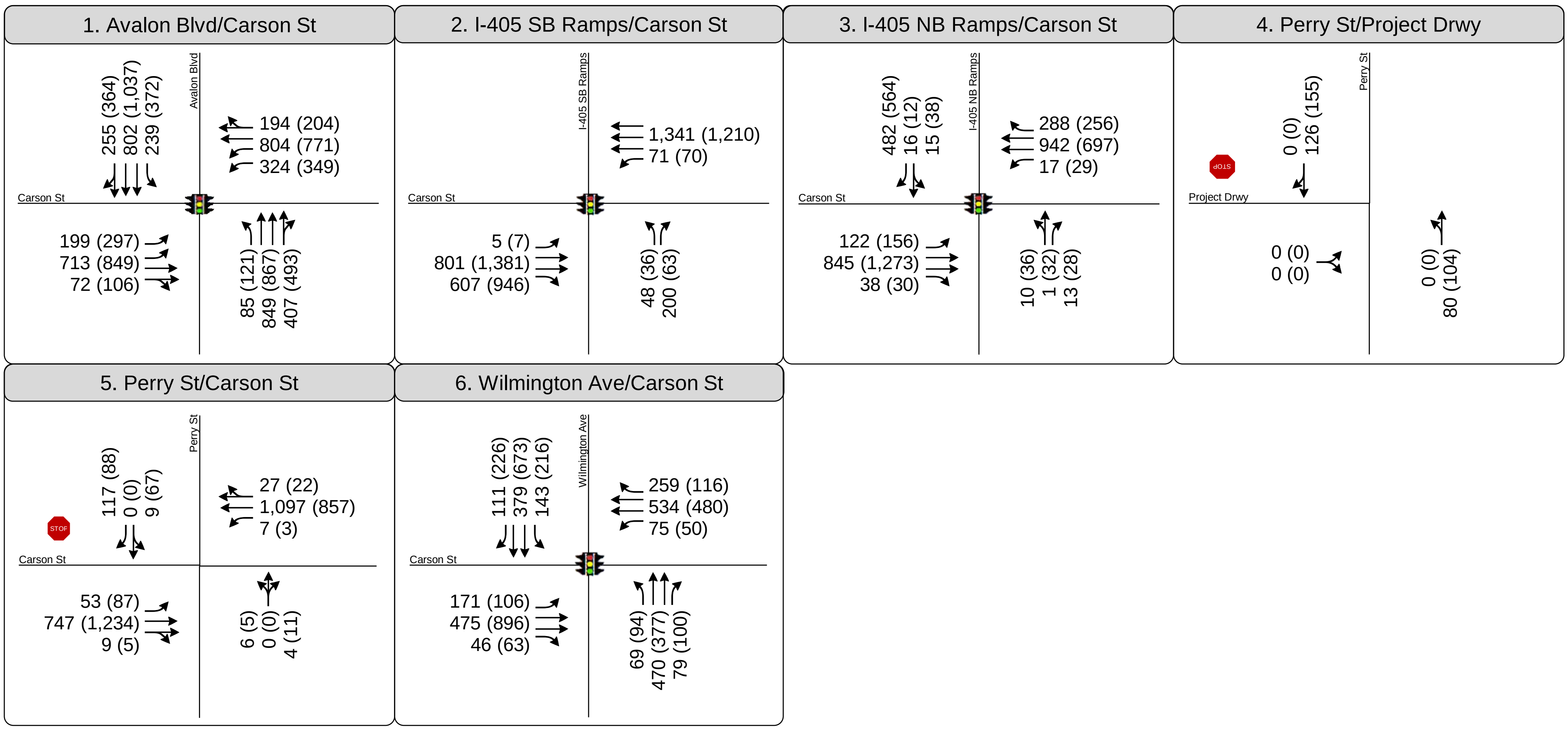
Traffic Volumes and Lane Configurations
Existing Conditions - AM (PM) Peak Hour



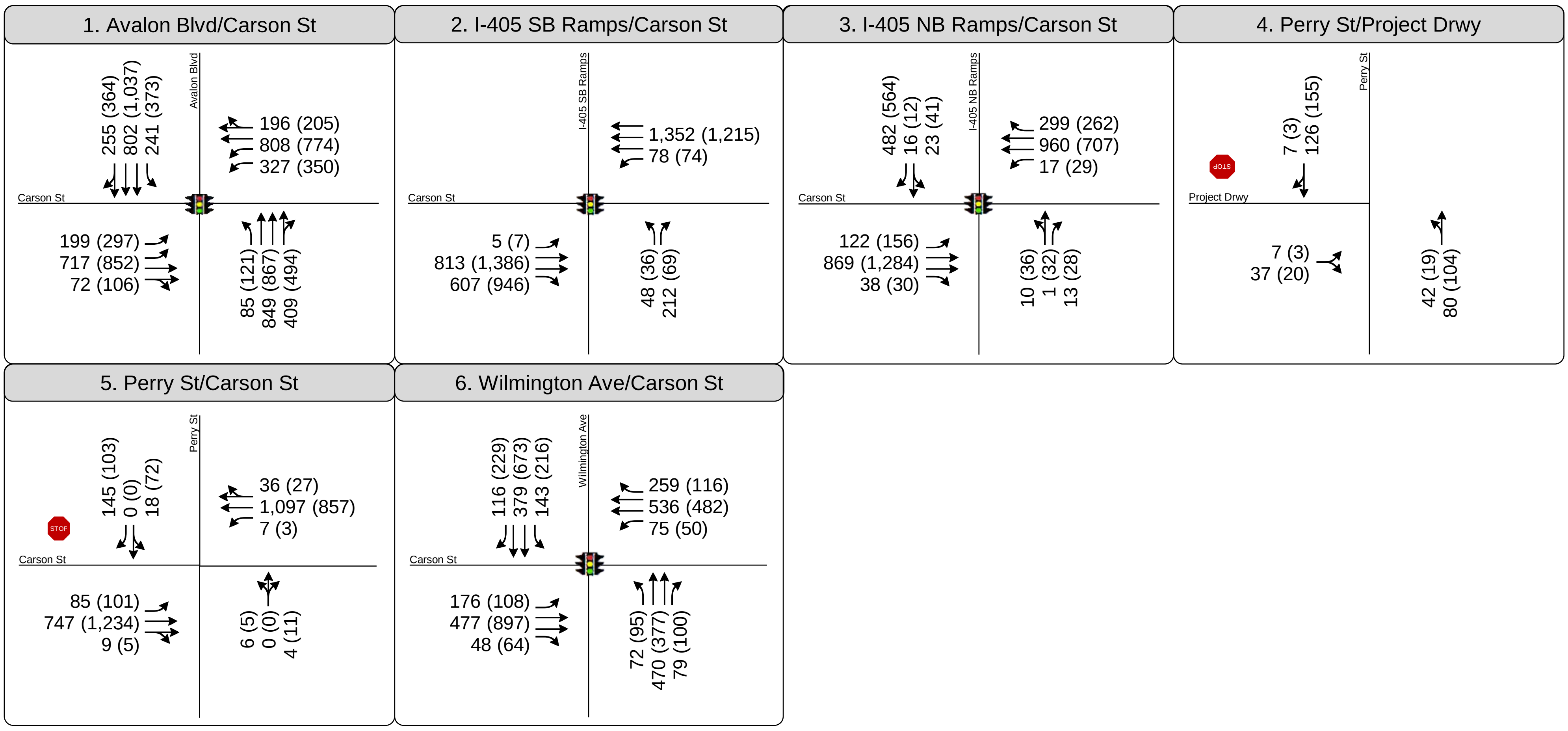
Traffic Volumes and Lane Configurations
Project Only Trips - AM (PM) Peak Hour



Traffic Volumes and Lane Configurations
Existing plus Ambient Growth plus Project Conditions - AM (PM) Peak Hour



Traffic Volumes and Lane Configurations
Future (Year 2023) Base Conditions - AM (PM) Peak Hour



Traffic Volumes and Lane Configurations
Future (Year 2023) plus Project Conditions - AM (PM) Peak Hour

APPENDIX B:
SIGNAL TIMING SHEETS

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09/KH By: PMP

T.S. No.: 3991   Date Implemented: 10-19-09 By: [illegible]

1. CONFIGURATION SUBMENU

1. CONTROLLER SEQUENCE

PRIORITY	1	2	3	4	5	6	7	8	9	10	11	12
RING 1	1	2	3	4								
RING 2	5	6	7	8								
CG (CONCURRENT GROUPS)		X		X								

2. PHASES IN USE

	PHASE NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
PHASES IN USE	X	X	X	X	X	X	X	X				
EXCLUSIVE PED												

3. PHASE TO LOAD SWITCH (MMU) ASSIGNMENT

LOAD SWITCH (MMU)	SIGNAL DRIVER GROUP		LOAD SWITCH (MMU)	SIGNAL DRIVER GROUP	
CHANNEL	PHASE/OVLP	PED	CHANNEL	PHASE/OVLP	PED
1	1		9	2	X
2	2		10	4	X
3	3		11	6	X
4	4		12	8	X
5	5		13		
6	6		14		
7	7		15		
8	8		16		

4. SDLC OPTIONS/ENABLES

	BIU NUMBER							
	1	2	3	4	5	6	7	8
TERM & FACIL								
DETECTOR RACK								
TYPE 2 RUNS AS TYPE 1								
MMU DISABLE								X
DIAGNOSTIC ENABLE (TEST FIXTURE)								
PEER TO PEER ENABLE								

PEER TO PEER ADDRESS:

1)		2)		3)		4)		5)	
6)		7)		8)		9)		10)	

5. PORT 2 CONFIGURATION

PORT 2 PROTOCOL	
PORT 2 ENABLE	
DATA RATE (BPS)	
DATA, PARITY, STOP	
AB3418 ADDRESS	
AB3418 GROUP ADDRESS	
AB3418 RESPONSE DELAY	
AB3418 SINGLE FLAG ENABLE	
AB3418 DROP-OUT TIME	
AB3418 TOD SF SELECT	
AB3418 RTS TIMING	
AB3418 RTS TO CTS DELAY	
AB3418 RTS TURN-OFF DELAY	
AB3418 EARLY RTS	

6. PORT 3 CONFIGURATION

PORT 3 PROTOCOL	
PORT 3 ENABLE	
PORT 3 MILLISEC TIMING	
PORT 3 RTS TO CTS DELAY	
PORT 3 RTS TURN-OFF DELAY	
DUPLEX -- HALF OR FULL	
MODEM DATA RATE (BPS)	
DATA, PARITY, STOP	
TELEMETRY ADDRESS	
SYSTEM DETECTOR 9-16 ADDRESS	
TELEMETRY RESPONSE DELAY	
AB3418 ADDRESS	
AB3418 GROUP ADDRESS	
AB3418 RESPONSE DELAY	
AB3418 SINGLE FLAG ENABLE	
AB3418 DROP-OUT TIME	
AB3418 TOD SF SELECT	
AB3418 EARLY RTS	
RICOCHET OPTION	
RICOCHET ADDRESS	
Auto Status Destination ADDR	
Auto Status Report Delay	
Icons Live Time	

8. UTILITIES SUBMENU

5. SIGN ON

SOFTWARE ASSY		VERSION
BOOT		
MAIN PROGRAM		
HELP		
CONFIGURATION		

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

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PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD

Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991

Date Implemented: 10-19-09 By: [illegible]

1. CONFIGURATION SUBMENU (Continued)

7. ENABLE EVENT LOGS

CRITICAL RFE'S (MMU/TF)	X
NON-CRITICAL RFE'S(DET/TEST)	X
DETECTOR ERRORS	X
COORDINATION ERRORS	X
MMU FLASH FAULTS	X
LOCAL FLASH FAULTS	X
PREEMPT	X
POWER ON/OFF	X
LOW BATTERY	X
SPARE	
ALARM 1	X
ALARM 2	
ALARM 3	
ALARM 4	
ALARM 5	
ALARM 6	
ALARM 7	
ALARM 8	
ALARM 9	
ALARM 10	
ALARM 11	
ALARM 12	
ALARM 13	
ALARM 14	
ALARM 15	
ALARM 16	

8. OPTIONS

SUPERVISOR ACCESS CODE	
DATA CHANGE ACCESS CODE	
KEY CLICK ENABLE	
BACKLIGHT ENABLE	

9. MMU PROGRAM CAN SERVE WITH

PHASE	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

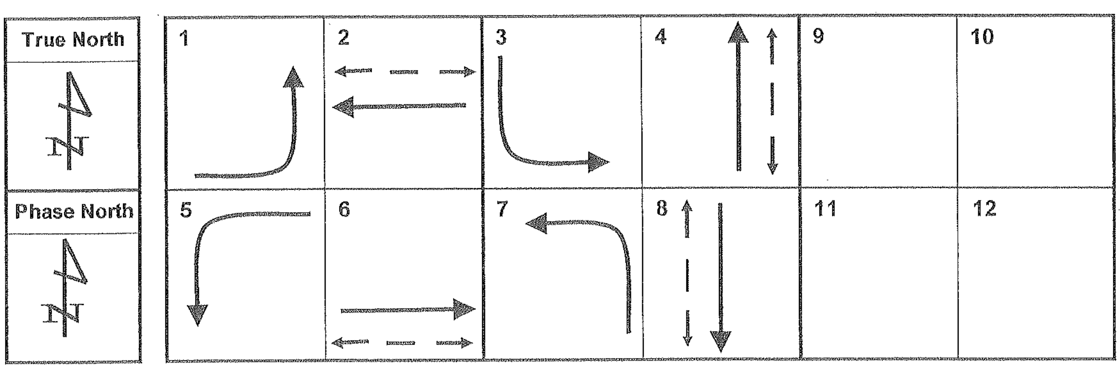
INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991   Date Implemented: 10-19-09 By: [illegible]

2. CONTROLLER SUBMENU

1. CONTROLLER TIMING DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MIN GREEN	4	6	4	6	4	6	4	6				
BIKE GREEN	0	0	0	0	0	0	0	0				
CS MIN GREEN	0	0	0	0	0	0	0	0				
WALK	0	7	0	7	0	7	0	7				
PED CLEAR	0	17	0	17	0	17	0	17				
VEH EXT	1.5	4.0	1.5	4.0	1.5	4.0	1.5	4.0				
VEH EXT 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
MAX EXT	0	0	0	0	0	0	0	0				
MAX 1	20	50	20	50	20	50	20	50				
MAX 2	20	130	20	50	20	130	20	50				
MAX 3	0	0	0	0	0	0	0	0				
DET MAX	0	0	0	0	0	0	0	0				
YELLOW	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5				
RED CLEAR	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0				
RED REVERT	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				
ACT B4	0	0	0	0	0	0	0	0				
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
MAX INITIAL	0	0	0	0	0	0	0	0				
TIME B4 REDUCTION	0	15	0	15	0	15	0	15				
CARS WT	0	255	0	255	0	255	0	255				
TIME TO REDUCE	0	15	0	15	0	15	0	15				
MIN GAP	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0				



COMMENTS:

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991 Date Implemented: 10-19-09 By: [illegible]

2. CONTROLLER SUBMENU (Continued)

2. PHASE OVERLAP ASSIGNMENTS

	OVERLAP CONSISTS OF PHASES:											
OVLP PHASE	1	2	3	4	5	6	7	8	9	10	11	12
1	X											
2		X										
3			X									
4				X								
5					X							
6						X						
7							X					
8								X				
9									X			
10										X		
11											X	
12												X

3. PED TIMING CARRYOVER

PHASE	CARRYOVER PHASE	PHASE	CARRYOVER PHASE
1		7	
2		8	
3		9	
4		10	
5		11	
6		12	

4. CONTROLLER RECALL DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
LOCKING MEMORY		X		X		X		X				
VEH RECALL												
PED RECALL												
RECALL TO MAX												
SOFT RECALL		X				X						
DON'T REST HERE												
PED DARK N/CALL												

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991   Date Implemented: ______ By: ______

2. CONTROLLER SUBMENU (Continued)

5. CONTROLLER OVERLAP DATA

OVERLAP A	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN TIMER												
LAG/LEAD GREEN TIMER												
LAG/LEAD YELLOW TIMER												
LAG/LEAD RED TIMER												

OVERLAP B	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN TIMER												
LAG/LEAD GREEN TIMER												
LAG/LEAD YELLOW TIMER												
LAG/LEAD RED TIMER												

OVERLAP C	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN TIMER												
LAG/LEAD GREEN TIMER												
LAG/LEAD YELLOW TIMER												
LAG/LEAD RED TIMER												

OVERLAP D	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN TIMER												
LAG/LEAD GREEN TIMER												
LAG/LEAD YELLOW TIMER												
LAG/LEAD RED TIMER												

PED OVERLAP ASSIGNMENTS
OVERLAP CONSISTS OF PHASES:

OVLP PHASE	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S
PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991 Date Implemented: 10-19-09 By: [illegible]

2. CONTROLLER SUBMENU (Continued)

6. CONTROLLER START/FLASH DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
POWER START		X				X						
EXTERNAL START		X				X						
ENTRY REM FLASH												
EXIT REM FLASH												
REM FLASH YELLOW												
FL TOGETHER PHS												
FL TOGETHER OVLPS	A			B			C			D		

POWER START	YELLOW	
EXTERNAL START	YELLOW	
POWER START ALL RED TIME	0	
POWER START FLASH TIME	0	
REMOTE FLASH OPTIONS:		
OUT OF FLASH YELLOW		
OUT OF FLASH ALL RED		
MINIMUM RECALL		
SPARE		
FLASH THRU LOAD SWITCHES		
CYCLE THROUGH PHASES		

7. NO SERVE PHASE

PHASE	12	11	10	9	8	7	6	5	4	3	2
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											

8. DIMMING

LOAD SWITCH	1	2	3	4	5	6	7	8
DIM GRN/WALK								
DIM YEL/PC								
DIM RED/DW								
LOAD SWITCH	9	10	11	12	13	14	15	16
DIM GRN/WALK								
DIM YEL/PC								
DIM RED/DW								

9. CONTROLLER OPTION DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
GUAR PASSAGE												
NON ACTUATED I												
NON ACTUATED II												
DUAL ENTRY												
COND SERVICE												
COND RESERVICE												
REST IN WALK												
FLASHING WALK												

FIVE SECTION LEFT TURN HEADS
(SPECIAL PROGRAM OPTION FOR STATE OF ILLINOIS)

5 - 2		7 - 4		1 - 6	
3 - 8		11 - 10		9 - 12	

DUAL ENTRY		RESERVED	
COND SERVICE ENABLE		BACKUP PROTECTION GROUP 1	
COND SERVICE DET X SWITCHING		BACKUP PROTECTION GROUP 2	
PED CLEAR PROTECT		BACKUP PROTECTION GROUP 3	
SPEC PREEMPT OVLP FLASH		SIMULTANEOUS GAP GROUP 1	ON
LOCK DETECTORS IN RED ONLY		SIMULTANEOUS GAP GROUP 2	ON
RESERVED		SIMULTANEOUS GAP GROUP 3	

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 /HC// By: PMP

T.S. No.: 3991   Date Implemented: 10-19-09 By: [illegible]

3. COORDINATOR SUBMENU

TIME OF DAY OPERATION SUMMARY					
PLAN 1	0900 - 1500 M-F 1800 - 2100 M-F	PLAN 4		PLAN 7	
PLAN 2	0600 - 0900 M-F	PLAN 5		PLAN 8	
PLAN 3	1500 - 1800 M-F	PLAN 6		PLAN 9	
FREE	ALL OTHER TIMES				

1. COORDINATOR OPTIONS

SPLIT UNITS	SEC	ACTUATED COORD PHASE(S)	X
OFFSET UNITS	SEC	ACTUATED WALK/REST	
INTERCONNECT FORMAT	STD	INHIBIT MAX	
INTERCONNECT SOURCE	NIC	MAX 2 SELECT	X
RESYNC COUNT	255	MULTISYNC	
TRANSITION	SMOOTH	FLOAT FORCE OFF	
DWELL PERIOD	255		
FREE ALTERNATE SEQUENCE	A B C	D E F	

2. COORD MANUAL AND SPLIT DEMAND

MANUAL ENABLE		MANUAL PATTERN	

SPLIT DEMAND:	DEMAND 1	DEMAND 2
DEMAND CALL TIME	0	0
DEMAND CYCLE COUNT	0	0

DEMAND PHASE	1	2	3	4	5	6	7	8	9	10	11	12
DEMAND 1 PHASES												
DEMAND 2 PHASES												

3. COORD AUTO PERM MIN GREEN

PHASE	AUTO PERM MIN GREEN	PHASE	AUTO PERM MIN GRN
1	7	7	7
2	7	8	7
3	7	9	
4	7	10	
5	7	11	
6	7	12	

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD

T.S. No.: 3991

Date Prepared: 9-30-09 Hell By: ?mp

Date Implemented: 10-19-09 By: [illegible]

3. COORDINATOR SUBMENU (Continued)

4. PATTERN DATA

COORD PATTERN	1		
CYCLE LENGTH	120	C/O/S	1/1/1
OFFSET	38		

SPLITS							
PHASE 1	19	PHASE 2	16	PHASE 3	16	PHASE 4	38
PHASE 5	19	PHASE 6	16	PHASE 7	16	PHASE 8	38
PHASE 9		PHASE 10		PHASE 11		PHASE 12	

VEH PERMISSIVE	[1]	0	[2]	0
VEH PERM 2 DISP				
PHASE RESERVICE				
SPLIT EXTENSION/RING	[1]	30	[2]	30
SPL DMD PATTERN	[1]		[2]	
XARTERY PATTERN				

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

COORD PATTERN	2		
CYCLE LENGTH	120	C/O/S	2/1/1
OFFSET	39		

SPLITS							
PHASE 1	19	PHASE 2	28	PHASE 3	16	PHASE 4	40
PHASE 5	19	PHASE 6	28	PHASE 7	16	PHASE 8	40
PHASE 9		PHASE 10		PHASE 11		PHASE 12	

VEH PERMISSIVE	[1]	0	[2]	0
VEH PERM 2 DISP				
PHASE RESERVICE				
SPLIT EXTENSION/RING	[1]	16	[2]	16
SPL DMD PATTERN	[1]		[2]	
XARTERY PATTERN				

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S
PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD

Date Prepared: 9-30-09Hdd By: PMP

T.S. No.: 3991

Date Implemented: 10-19-09 By: [illegible]

3. COORDINATOR SUBMENU (Continued)

4. PATTERN DATA (Continued)

COORD PATTERN	3		
CYCLE LENGTH	120	C/O/S	3/1/1
OFFSET	48		

SPLITS							
PHASE 1	20	PHASE 2	26	PHASE 3	19	PHASE 4	38
PHASE 5	20	PHASE 6	26	PHASE 7	19	PHASE 8	38
PHASE 9		PHASE 10		PHASE 11		PHASE 12	
VEH PERMISSIVE	[1]	0	[2]	0			
VEH PERM 2 DISP							
PHASE RESERVICE							
SPLIT EXTENSION/RING	[1]	16	[2]	16			
SPL DMD PATTERN	[1]		[2]				
XARTERY PATTERN							

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

COORD PATTERN	4		
CYCLE LENGTH		C/O/S	
OFFSET			

SPLITS							
PHASE 1		PHASE 2		PHASE 3		PHASE 4	
PHASE 5		PHASE 6		PHASE 7		PHASE 8	
PHASE 9		PHASE 10		PHASE 11		PHASE 12	
VEH PERMISSIVE	[1]		[2]				
VEH PERM 2 DISP							
PHASE RESERVICE							
SPLIT EXTENSION/RING	[1]		[2]				
SPL DMD PATTERN	[1]		[2]				
XARTERY PATTERN							

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES												
VEHICLE RECALL												
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

Up to 64 Coordination Patterns Available.

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH   By: PMP

T.S. No.: 3991   (NOT USED)   Date Implemented: ______   By: ______

4. PREEMPTOR SUBMENU

1. PRIORITY PREEMPTOR 1

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			

2. PRIORITY PREEMPTOR 2

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

3. PRIORITY PREEMPTOR 3

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

4. PRIORITY PREEMPTOR 4

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD Date Prepared: 9-30-09 HeH By: PMP

T.S. No.: 3991 **(NOT USED)** Date Implemented: ______ By: ______

4. PREEMPTOR SUBMENU (Continued)

5. PRIORITY PREEMPTOR 5

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

6. PRIORITY PREEMPTOR 6

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

7. BUS PREEMPTORS

	BUS PREEMPTOR			
	1	2	3	4
PREEMPTOR ACTIVE				
DETECTOR LOCK				
MAXIMUM TIME				
RESERVICE TIME				
DELAY TIME				
INHIBIT TIME				
ENTRANCE GREEN				
ENTRANCE PED CLEAR				
ENTRANCE YELLOW				
ENTRANCE RED				
MIN HOLD TIME				

	HOLD PHASE											
	1	2	3	4	5	6	7	8	9	10	11	12
PREEMPTOR 1												
PREEMPTOR 2												
PREEMPTOR 3												
PREEMPTOR 4												

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD

Date Prepared: 9-30-09 HCH By: [illegible]

T.S. No.: 3991

Date Implemented: 10-19-09 By: [illegible]

5. NIC/TOD SUBMENU

1. NIC/TOD CLOCK/CALENDAR DATA

DATE SET	
TIME SET	
MANUAL NIC PROGRAM STEP	0
MANUAL TOD PROGRAM STEP	0
SYNC REFERENCE TIME	★ ★ 0000
SYNC REFERENCE	REFERENCE TIME
WEEK 1 BEGINS ON 1ST SUNDAY	
DISABLE DAYLIGHT SAVINGS	
DST BEGINS LAST SUNDAY	

2. NIC/TOD WEEKLY PROGRAMS

WEEK	SUN	MON	TUE	WED	THU	FRI	SAT
1	2	1	1	1	1	1	2
2							
3							
4							
5							
6							
7							
8							
9							
10							

3. NIC/TOD YEARLY PROGRAMS

WEEK OF YEAR	1	2	3	4	5	6	7	8
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	9	10	11	12	13	14	15	16
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	17	18	19	20	21	22	23	24
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	25	26	27	28	29	30	31	32
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	33	34	35	36	37	38	39	40
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	41	42	43	44	45	46	47	48
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR				49	50	51	52	53
WEEKLY PROGRAM				1	1	1	1	1

4. NIC/TOD HOLIDAY PROGRAM

HOLIDAY	FLOAT/FIXED	MON/MON	DOW/DOM	WOM/YEAR	PROG
1	FIXED	1	1	0	2
2	FIXED	7	4	0	2
3	FIXED	11	11	0	2
4	FIXED	12	24	0	2
5	FIXED	12	25	0	2
6					
7					
8					
9					
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36					

★ ★ **NOTE:** WHEN USING RCTB UNIT, IN ORDER FOR THE CONTROLLER CLOCK TO BE PROPERLY UPDATED, THE RCTB UNIT MUST BE DESIGNED FOR A 3:30 AM SYNC PULSE.

LOS ANGELES COUNTY
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INTERSECTION: CARSON ST @ AVALON BLVD

Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991

Date Implemented: 10-19-09 By:

5. NIC/TOD SUBMENU (Continued)

5. NIC PROGRAM STEP

STEP	PGM	TIME	PATTERN	OVERRIDE
1	1	0000	0	
2	2	0000	0	
3	1	0600	2	
4	1	0900	1	
5	1	1500	3	
6	1	1800	1	
7	1	2100	0	

Up to 200 NIC Program Steps Available.

LOS ANGELES COUNTY
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Date Prepared: 9-30-09 HCH By: PMP

Date Implemented: ________ By: ______

(NOT USED)

5. NIC/TOD SUBMENU (Continued)

6. TOD PROGRAM STEPS

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH				DIM ENABLE								
RED REST				ALT VEH EXTSN								
SPARE 5				DET LOG ENABLE								
SPARE 3				SPARE 4								
TYPE 0 DELAY ENABLE				SPARE 2								
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH				DIM ENABLE								
RED REST				ALT VEH EXTSN								
SPARE 5				DET LOG ENABLE								
SPARE 3				SPARE 4								
TYPE 0 DELAY ENABLE				SPARE 2								
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH				DIM ENABLE								
RED REST				ALT VEH EXTSN								
SPARE 5				DET LOG ENABLE								
SPARE 3				SPARE 4								
TYPE 0 DELAY ENABLE				SPARE 2								
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH				DIM ENABLE								
RED REST				ALT VEH EXTSN								
SPARE 5				DET LOG ENABLE								
SPARE 3				SPARE 4								
TYPE 0 DELAY ENABLE				SPARE 2								
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

LOS ANGELES COUNTY
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T.S. No.: 3991

(NOT USED)

Date Implemented: ______ By: ______

5. NIC/TOD SUBMENU (Continued)

6. TOD PROGRAM STEPS (CONTINUED)

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

Up to 100 TOD Program Steps Available.

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991   Date Implemented: 10-19-09 By: [illegible]

6. DETECTORS SUBMENU

1. DETECTOR TYPE/TIMERS

DETECTOR	TYPE	LOCK	EXTEND	DELAY	NO RESET	LOG ENABLE
1	0					
2	5		2.0			
3	0					
4	5		2.0			
5	0					
6	5		2.0			
7	0					
8	5		2.0			
9	0					
10	0					
11	0					
12	0					
13	0					
14	0					
15						
16						
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64						

2. DETECTOR PHASE ASSIGNMENT

	PHASE ASSIGNMENT											
DETECTOR	1	2	3	4	5	6	7	8	9	10	11	12
1	X											
2		X										
3			X									
4				X								
5					X							
6						X						
7							X					
8								X				
9						X						
10				X								
11		X										
12								X				
13	X											
14					X							
15												
16												
17												
18												
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LOS ANGELES COUNTY
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T.S. No.: 3991   Date Implemented: 10-14-09 By: [illegible]

6. DETECTORS SUBMENU (Continued)

3. PED AND SYSTEM DETECTOR LOCAL ASSIGNMENT

DETECTOR LOG INTERVAL					MINUTES			
LOCAL PED DET NUMBER	PHASE PED DETECTOR							
	1	2	3	4	5	6		
		2		4		6		
	7	8	9	10	11	12		
NUMBER		8						
LOCAL DET NUMBER	LOCAL SYSTEM DETECTOR NUMBER							
	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16
NUMBER								

Section 6-4: (See Next Page)

5. SPEED DETECTORS

SPEED DETECTOR NUMBERS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ONE DETECTOR SPEED:																
LOCAL DET NUMBER																
VEHICLE LENGTH																
LOOP LENGTH																
TWO DETECTOR SPEED:																
LOCAL DET NUMBER																
SPEED TRAP LENGTH																
ENABLE LOG																
UNITS:																

Section 6-6: (See Next Page)

7. PED DETECTOR DIAGNOSTIC PLAN

PLAN	DET NO.	1	2	3	4	5	6	7	8	9	10	11	12
1	DIAG NO.												
	SCALING												
2	DIAG NO.												
	SCALING												
3	DIAG NO.												
	SCALING												
4	DIAG NO.												
	SCALING												
5	DIAG NO.												
	SCALING												
6	DIAG NO.												
	SCALING												
7	DIAG NO.												
	SCALING												
8	DIAG NO.												
	SCALING												

LOS ANGELES COUNTY
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T.S. No.: 3991 (NOT USED) Date Implemented: ______ By: ______

6. DETECTORS SUBMENU (Continued)

4. CROSS SWITCHING

	PHASES											
DETECTOR	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
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64												

6. VEHICLE DETECTOR DIAGNOSTIC PLAN

PLAN	DET NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	DIAG NO																
	SCALING																
2	DIAG NO																
	SCALING																
3	DIAG NO																
	SCALING																
4	DIAG NO																
	SCALING																
5	DIAG NO																
	SCALING																
6	DIAG NO																
	SCALING																
7	DIAG NO																
	SCALING																
8	DIAG NO																
	SCALING																
FAIL ACTION																	

PLAN	DET NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	DIAG NO																
	SCALING																
2	DIAG NO																
	SCALING																
3	DIAG NO																
	SCALING																
4	DIAG NO																
	SCALING																
5	DIAG NO																
	SCALING																
6	DIAG NO																
	SCALING																
7	DIAG NO																
	SCALING																
8	DIAG NO																
	SCALING																
FAIL ACTION																	

PLAN	DET NO.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1	DIAG NO																
	SCALING																
2	DIAG NO																
	SCALING																
3	DIAG NO																
	SCALING																
4	DIAG NO																
	SCALING																
5	DIAG NO																
	SCALING																
6	DIAG NO																
	SCALING																
7	DIAG NO																
	SCALING																
8	DIAG NO																
	SCALING																
FAIL ACTION																	

Vehicle Detector Diagnostic Plans for Detectors 49-64 Also Available.

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH   By: PMP

(NOT USED)

T.S. No.: 3991   Date Implemented: ______   By: ______

6. DETECTORS SUBMENU (Continued)

8. DETECTOR DIAGNOSTIC INTERVAL

DETECTOR DIAGNOSTIC INTERVAL			
DIAGNOSTIC NUMBER	NO ACTIVITY	MAX PRESENCE	ERRATIC COUNTS
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991   Date Implemented: 10-19-09 By: W

NOTE: NOT IN SEQUENTIAL ORDER

DETECTOR ASSIGNMENT WORK SHEET

LOOP LOCATION	LANE	DET ASSIGN	DET TYP #	PHASE 1	2	3	4	5	6	7	8	9	10	11	12	DET DELAY	DET EXTEND	QUEUE MAX	REMARKS
1-N-Ø3	LT	3	0			X													F
2-S-Ø4	1,2,3	4	5				X										2.0		Q
1-W-Ø1	LT-1	1	0	X															F
2-E-Ø2	1,2	2	5		X												2.0		Q
1-S-Ø7	LT	7	0							X									F
2-N-Ø8	1,2,3	8	5								X						2.0		Q
1-E-Ø5	LT-1	5	0					X											F
2-W-Ø6	1,2	6	5						X								2.0		Q
1-E-Ø2	1,2	11	0		X														A
1-N-Ø8	1,2	12	0								X								A
1-W-Ø6	1,2	9	0						X										A
1-S-Ø4	1,2	10	0				X												A
2-W-Ø1	LT-2	13	0	X															F
2-E-Ø5	LT-2	14	0					X											F

DETECTOR ASSIGNMENT DEFINITIONS

CONTROLLER	CONNECTOR'S A,B,C								CONNECTOR D								CONNECTOR TELEMETRY								CONNECTOR TYPE 1							
	DETECTOR								DETECTOR								DETECTOR								INPUT TYPE 1 ONLY							
ASC-2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

* = DELAY Time or EXTEND Time set on External Sensor

** = When the Detector Input is set to be a TYPE 4 Detector, the EXTEND value set in the Controller becomes the QUEUE MAX value and any Extension Time needed must be set externally on the Sensor. If the Detector Input is set to be a TYPE 5, the EXTEND value becomes a Reset (Gap) Timer value and the Extension Time is set Externally on the Sensor Unit.

Q = QUEUE CLEARING LOOP   F = FIRST VEHICLE LOOP
H = HOLDING LOOP   A = ADVANCE LOOP

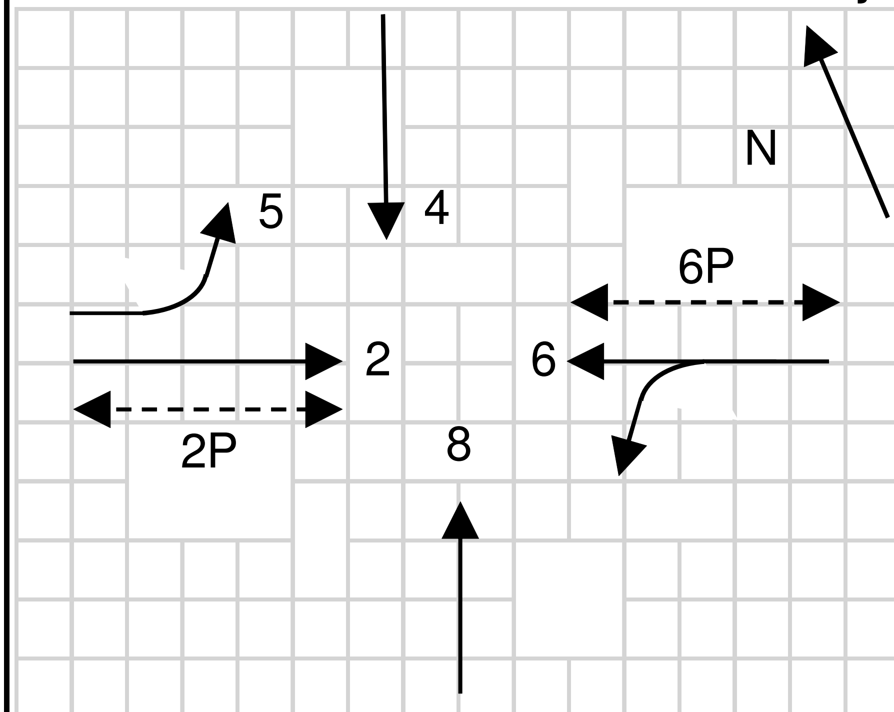
Location: R405 NB @ Carson St
Designed By: HD
System:
District: 07
Installed By: HD
Master At: Here
I/C: NB-SB Ramp
Service Info:

Timing Change:	Date Start:	Date End:	Designed:	Installed:
	10/29/2020		10/15/2020	10/29/2020

Intersection Layout

PHASE		FLASH
1)		[ ]
2)	EB Carson St (2ped)	[ ]
3)		[ ]
4)	NB off Ramp	[ ]
5)	EBLT Carson St	[ ]
6)	WB Carson St (6 ped)	[ ]
7)		[ ]
8)	NB Recreation Rd	[ ]

OVERLAP	FLASH
A)	[ ]
B)	[ ]
C)	[ ]
D)	[ ]
E)	[ ]
F)	[ ]



Comments and Notes:
* To prevent yellow trap WBLT (phase 5 place a call to phase 4 by 2-1-2-1)

RAM Checksum

Page 2: 5B9D	Page 8: 5996
Page 3: 034A	Page 9: D2FD
Page 4: A5B2	Page 10: D42B
Page 5: 191A	Page 11: C838
Page 6: 191A	Page 12: 1FB3
Page 7: 12D9	Page 13: 86F7

CONFIGURATION PHASE FLAGS

Cabinet (9-3)
332
Configuration
CALTRANS

Phases (2-1-1-1)	
Permitted	. 2 . 4 5 6 . 8
Restricted	. . . .

Phase Features (2-1-1-4)	
Double Entry	. . . .
Rest In Walk	. . . .
Rest In Red	. . . .
Walk 2	. . . .
Max Green 2	. . . .
Max Green 3	. . . .

Startup (2-1-1-5)	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . . 4 . . . .
Vehicle Calls	. 2 . 4 5 6 . 8
Pedestrian Calls	. 2 . . . 6 . .
Yellow Start Overlaps	. . . . . .
Startup All-Red	6.0

Phase Recalls (2-1-1-2)	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . .
Pedestrian	. . . .
Bicycle	. . . .

Phase Locks (2-1-1-3)	
Red	. . . . 5 . . .
Yellow	. 2 . . . 6 . .
Force/Max	. . . .

Call To Phase (2-1-2-1)		Omit On Green	
1	. . . .	1	. . . .
2	. . . .	2	. . . .
3	. . . .	3	. . . .
4	. . . .	4	. . . .
5	. . . 4	5	. . . .
6	. . . .	6	. . . .
7	. . . .	7	. . . .
8	. . . .	8	. . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . .
Yellow Flash Overlaps	. . . . . .
Flash In Red Phases	. . . .
Flash In Red Overlaps	. . . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . .
Driveway Signal Phases	. . . .
Driveway Signal Overlaps	. . . . . .
Leading Ped Phases	. . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . .

Pedestrian (2-1-3)	
P1	. . . .
P2	. 2 . . . . . .
P3	. . . .
P4	. . . 4 . . . .
P5	. . . .
P6	. . . . . 6 . .
P7	. . . .
P8	 8

Overlap (2-1-4)

Overlap	Parent	Omit	No Start	Not
A	. . . .	. . . .	. . . .	. . . .
B	. . . .	. . . .	. . . .	. . . .
C	. . . .	. . . .	. . . .	. . . .
D	. . . .	. . . .	. . . .	. . . .
E	. . . .	. . . .	. . . .	. . . .
F	. . . .	. . . .	. . . .	. . . .

PHASE TIMING

Phase (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	7	0	0	0	7	0	0
Flash Don't Walk	0	25	0	0	0	18	0	0
Minimum Green	10	10	10	10	10	10	10	10
Det Limit	10	0	10	0	0	0	10	0
Max Initial	10	20	10	0	0	20	10	0
Max Green 1	50	40	50	20	20	40	50	20
Max Green 2	50	40	50	20	20	40	50	20
Max Green 3	50	40	50	20	20	40	50	20
Extension	5.0	4.0	5.0	3.0	2.5	4.0	5.0	3.0
Maximum Gap	5.0	5.0	5.0	3.0	2.5	5.0	5.0	3.0
Minimum Gap	5.0	3.0	5.0	3.0	2.5	3.0	5.0	3.0
Add Per Vehicle	1.0	2.0	1.0	0.0	0.0	2.0	1.0	0.0
Reduce Gap By	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Reduce Every	1.0	1.0	1.0	0.0	0.0	1.0	1.0	0.0
Yellow	5.0	4.4	5.0	4.1	3.7	4.4	5.0	4.1
All-Red	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Ped/Bike (2-3)	**-1-**	**-2-**	**-3-**	**-4-**	**-5-**	**-6-**	**-7-**	**-8-**
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	5.0
All-Red Sec/Min (2-6)	
All-Red Sec/Min:	OFF

Max 2 Extension

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

Local Plan 1...9 (7-1) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor	90		....	10				58		20	25	28		20
Plan 2	Green Factor	90		....	10				58		20	25	28		20
Plan 3	Green Factor	90		....	10				58		20	25	28		20
Plan 4	Green Factor			....											
Plan 5	Green Factor			....											
Plan 6	Green Factor			....											
Plan 7	Green Factor			....											
Plan 8	Green Factor			....											
Plan 9	Green Factor			....											

Local Plan 1...9 (7-1) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.2.4.6.8	.2...6..	....	....	....	....	.2...6..	....
Plan 2	.2.4.6.8	.2...6..	....	....	....	....	.2...6..	....
Plan 3	.2.4.6.8	.2...6..	....	....	....	....	.2...6..	....
Plan 4	....	....	....	....	....	....	....	....
Plan 5	....	....	....	....	....	....	....	....
Plan 6	....	....	....	....	....	....	....	....
Plan 7	....	....	....	....	....	....	....	....
Plan 8	....	....	....	....	....	....	....	....
Plan 9	....	....	....	....	....	....	....	....

Master Timer Sync (7-A)	
Enable in Plans	
1-9	....
11-19	....
21-29	....

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
.2.4.6.8	....
Veh Min	Veh Max
.2...6..	....
Ped	Bike
....	....
Cond	Cond Grn
....	10

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-29
254 = Flash
255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

Local Plan 11...19 (7-2) TIMING DATA

COORDINATION

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
					[Offsets]			Green Factors or Press [F] to Select Force-Off							
Plan 11	Green Factor			....											
Plan 12	Green Factor			....											
Plan 13	Green Factor			....											
Plan 14	Green Factor			....											
Plan 15	Green Factor			....											
Plan 16	Green Factor			....											
Plan 17	Green Factor			....											
Plan 18	Green Factor			....											
Plan 19	Green Factor			....											

Local Plan 11...19 (7-2) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 11	....	....	....	....	....	....	....	....
Plan 12	....	....	....	....	....	....	....	....
Plan 13	....	....	....	....	....	....	....	....
Plan 14	....	....	....	....	....	....	....	....
Plan 15	....	....	....	....	....	....	....	....
Plan 16	....	....	....	....	....	....	....	....
Plan 17	....	....	....	....	....	....	....	....
Plan 18	....	....	....	....	....	....	....	....
Plan 19	....	....	....	....	....	....	....	....

Local Plan 21...29 (7-3) TIMING DATA

COORDINATION

		Cycle	Multi	Lag Gap	[Offsets] A	B	C	Green Factors or Press [F] to Select Force-Off -1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 21	Green Factor			....											
Plan 22	Green Factor			....											
Plan 23	Green Factor			....											
Plan 24	Green Factor			....											
Plan 25	Green Factor			....											
Plan 26	Green Factor			....											
Plan 27	Green Factor			....											
Plan 28	Green Factor			....											
Plan 29	Green Factor			....											

Local Plan 21...29 (7-3) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 21	....	....	....	....	....	....	....	....
Plan 22	....	....	....	....	....	....	....	....
Plan 23	....	....	....	....	....	....	....	....
Plan 24	....	....	....	....	....	....	....	....
Plan 25	....	....	....	....	....	....	....	....
Plan 26	....	....	....	....	....	....	....	....
Plan 27	....	....	....	....	....	....	....	....
Plan 28	....	....	....	....	....	....	....	....
Plan 29	....	....	....	....	....	....	....	....

DETECTORS

Detector Attributes (5-1) / Slot / Detector Configuration (5-2)

Det	Type	Phases	Lock	Slot	Det	Delay	Extend	Recall	Port
1	COUNT+CALL+EXTEND	1.......	NO	I1U	1			10	3.2
2	COUNT+CALL+EXTEND	1.......	NO	I1L	2			10	7.2
3	COUNT+CALL+EXTEND	.2......	NO	I2U	3			10	1.1
4	COUNT+CALL+EXTEND	.2......	NO	I2L	4			10	1.5
5	COUNT+CALL+EXTEND	.2......	NO	I3U	5			10	4.5
6	CALL+EXTEND	.2......	NO	I3L	6			10	6.2
7	LIMITED	.2......	NO	I4U	7			10	2.1
8	COUNT+CALL+EXTEND	.2......	NO	I4L	8			10	7.4
9	COUNT+CALL+EXTEND	..3.....	NO	I5U	9			10	3.4
10	COUNT+CALL+EXTEND	..3.....	NO	I5L	10			10	7.6
11	COUNT+CALL+EXTEND	...4....	NO	I6U	11			10	1.3
12	COUNT+CALL+EXTEND	...4....	NO	I6L	12			10	1.7
13	COUNT+CALL+EXTEND	...4....	NO	I7U	13			10	4.7
14	CALL+EXTEND	...4....	NO	I7L	14			10	6.4
15	LIMITED	...4....	NO	I8U	15			10	2.3
16	COUNT+CALL+EXTEND	...4....	NO	I8L	16			10	7.8
17	COUNT+CALL+EXTEND	1.......	NO	I9U	17			10	3.6
18	COUNT+CALL+EXTEND	..3.....	NO	I9L	18			10	3.8
19	COUNT+CALL+EXTEND	.2......	NO	I10U	19			10	4.1
20	COUNT+CALL+EXTEND	...4....	NO	I10L	20			10	4.2
21	COUNT+CALL+EXTEND	....5...	NO	J1U	21			10	3.1
22	COUNT+CALL+EXTEND	....5...	NO	J1L	22			10	7.1
23	COUNT+CALL+EXTEND	.....6..	NO	J2U	23			10	1.2
24	COUNT+CALL+EXTEND	.....6..	NO	J2L	24			10	1.6
25	COUNT+CALL+EXTEND	.....6..	NO	J3U	25			10	4.6
26	CALL+EXTEND	.....6..	NO	J3L	26			10	6.3
27	LIMITED	.....6..	NO	J4U	27			10	2.2
28	COUNT+CALL+EXTEND	.....6..	NO	J4L	28			10	7.3
29	COUNT+CALL+EXTEND	......7.	NO	J5U	29			10	3.3
30	COUNT+CALL+EXTEND	......7.	NO	J5L	30			10	7.5
31	COUNT+CALL+EXTEND	8	NO	J6U	31			10	1.4
32	COUNT+CALL+EXTEND	8	NO	J6L	32			10	1.8
33	COUNT+CALL+EXTEND	8	NO	J7U	33			10	4.8
34	CALL+EXTEND	8	NO	J7L	34			10	6.5
35	LIMITED	8	NO	J8U	35			10	2.4
36	COUNT+CALL+EXTEND	8	NO	J8L	36			10	7.7
37	COUNT+CALL+EXTEND	....5...	NO	J9U	37			10	3.5
38	COUNT+CALL+EXTEND	......7.	NO	J9L	38			10	3.7
39	COUNT+CALL+EXTEND	.....6..	NO	J10U	39			10	4.3
40	COUNT+CALL+EXTEND	8	NO	J10L	40			10	4.4
41	PEDESTRIAN	.2......	NO	I12U	41			10	5.1
42	PEDESTRIAN	...4....	NO	I12L	42			10	5.3
43	PEDESTRIAN	.....6..	NO	I13U	43			10	5.2
44	PEDESTRIAN	8	NO	I13L	44			10	5.4

Failure Times(5-3)	Minutes
Maximum On Time	
Fail Reset Time	

Failure Override (5-4)	
Detectors 1-8	....
Detectors 9-16	....
Detectors17-24	....
Detectors 25-32	....
Detectors 33-40	....
Detectors 41-44	....

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Nu								
Sys Det	9	10	11	12	13	14	15	16
Det Nu								

CIC Operation (5-6-1)	
Enable in Plans	....

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.00	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase								
Sys Det	9	10	11	12	13	14	15	16
Phase								

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6	4.1	6.6	5.1	5.2	6.7
	7.2	1.5	6.2	7.4	7.6	1.7	6.4	7.8	3.8	4.2	2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5	4.3	2.8	5.5	5.6	2.5
	7.1	1.6	6.3	7.3	7.5	1.8	6.5	7.7	3.7	4.4	6.1	5.7	5.8	2.6

TOD SCHEDULE

Table 1 (8-2-1)			Table 2 (8-2-2)			Table 3 (8-2-3)			Table 4 (8-2-4)			Table 5 (8-2-5)			Table 6 (8-2-6)		
Time	Plan	OS	Time	Plan	OS	Time	Plan	OS	Time	Plan	OS	Time	Plan	OS	Time	Plan	OS
0600	2	A	0630	1	A			A			A			A			A
0900	255	A	0900	255	A			A			A			A			A
1500	3	A			A			A			A			A			A
1800	1	A			A			A			A			A			A
2000	255	A			A			A			A			A			A
		A			A			A			A			A			A
		A			A			A			A			A			A
		A			A			A			A			A			A
		A			A			A			A			A			A
		A			A			A			A			A			A
		A			A			A			A			A			A
		A			A			A			A			A			A
		A			A			A			A			A			A
		A			A			A			A			A			A
		A			A			A			A			A			A
		A			A			A			A			A			A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1			....	
2			....	
3			....	
4			....	
5			....	
6			....	
7			....	
8			....	
9			....	
10			....	
11			....	
12			....	
13			....	
14			....	
15			....	
16			....	

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1			....	
2			....	
3			....	
4			....	
5			....	
6			....	
7			....	
8			....	
9			....	
10			....	
11			....	
12			....	
13			....	
14			....	
15			....	
16			....	

Daylight Saving (8-1)

Enabled	YES

	Month	Sunday
Start	MAR	2nd
End	NOV	1st

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	....
Holiday	....

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1			....		....
2			....		....
3			....		....
4			....		....
5			....		....
6			....		....
7			....		....
8			....		....
9			....		....
10			....		....
11			....		....
12			....		....
13			....		....
14			....		....
15			....		....
16			....		....

Action Codes:
0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11.Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting
100+Action Code = Phases removed
200+Action Code = Phases replaced

COMMUNICATIONS

	C2 (6-1-1)	C20 (6-1-2)	C21 (6-1-3)
Address			
Baud	1200	1200	1200
Protocol	MASTER	AB3418	AB3418
Data Bits	8	8	8
Parity	NONE	NONE	NONE
Stop Bits	1	1	1
RTS On Time	20	20	20
RTS Off Time	20	20	20
Handshaking	NORMAL	NORMAL	NORMAL
Access Level	0	0	0

SOFT LOGIC

Soft Logic (6-2)

#	Data	OP	Data	OP	Data	OP	Data
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

*Refer to User's Manual for Data and OP Codes

CALLBACK NUMBERS

Callback Numbers (6-3...3)

Line Out			
Long Distance			
Local Toll			
Delay	10	10	10
Area Code			
Phone Number			

NETWORK

Network Parameters (6-4)

Address	
Protocol	AB3418
Port	27000
Type	STATIC
Central Access	
Field Access	
ATSPM	OFF

IP Address	0	0	0	0
Netmask	255	255	255	0
Broadcast	0	0	0	255
Gateway	0	0	0	254

Access Levels:

0-Full Access
1-Status Only
2-Status, Set Pattern, Time
3-Status, Set Pattern, Time, Manual Plan
4-Reserved
5-Full Access with No Set Pattern
6-Full Access with No Set Time
7-Full Access with No Set Pattern, Manual Plan
8-Full Access with No Set Time, Pattern, Manual Plan

SPAT Network (6-5)

SPAT	1	2
Protocol	NONE	NONE
UDP Port	0	0

IP Address 0 . 0 . 0 . 0

RAILROAD PREEMPTION

RR 1

Timing (3-1-1)	
Clear 1	15
Clear 2	5
Clear 3	
Hold	
Min Gr	
Delay	
Exit	
Ped Clr	

Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
. 2 . . 5 . . .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. 2 . . 5 . . .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . . . .	. . . . . .	. . . . . .
1 . . 4 . . 7 8	. . . .	. . . .	. . . .	. . . 4 . . . 8	. 2 . . . 6 . .	. . . . . .	. . . . . .	. . . . . .

Exit Parameters (3-1-5)			
Phase Green	Ovrlap Green	Veh Permit/Call	Ped Permit/Call
. 2 . . . 6 . .	. . . . . .	1 2 3 4 5 6 7 8	. 2 . 4 . 6 . 8

Configuration (3-1-6)

	PR	XR	Gate	Isld	APP	Sign	Sign	Max On	Latching
1								5	NO
2									

Valid Inputs: 1.x, 2.x, 3.x, 4.x, 5.x, 6.x, 7.x, 8.x x=1 to 8
Valid Outputs: 11.x, 12.x, 13.x, 14.x, 15.x, 16.x, 17.x, 18.x x=1 to 8

RR 2

Timing (3-2-1)	
Clear 1	15
Clear 2	5
Clear 3	
Hold	
Min Gr	
Delay	
Exit	
Ped Clr	

Phase Flags (3-2-2)			Pedestrian Flags (3-2-3)			Overlap Flags (3-2-4)		
Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
. . . 4 . . 7 .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . 4 . . 7 .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . . . .	. . . . . .	. . . . . .
1 2 3 . . 6 . .	. . . .	. . . .	. . . .	. 2 . . . 6 . .	. . . 4 . . . 8	. . . . . .	. . . . . .	. . . . . .

Exit Parameters (3-2-5)			
Phase Green	Ovrlap Green	Veh Permit	Ped Permit
. 2 . . . 6 . .	. . . . . .	1 2 3 4 5 6 7 8	. 2 . 4 . 6 . 8

Configuration (3-2-6)

	PR	XR	Gate	Isld	APP	Sign	Sign	Max On	Latching
1								5	NO
2									

Valid Inputs: 1.x, 2.x, 3.x, 4.x, 5.x, 6.x, 7.x, 8.x x=1 to 8
Valid Outputs: 11.x, 12.x, 13.x, 14.x, 15.x, 16.x, 17.x, 18.x x=1 to 8

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	. 2 . . 5 . . .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVB (3-B)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	. . . 4 . . 7 .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVC (3-C)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	1 . . . . 6 . .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVD (3-D)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	. . 3 8	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

INPUTS

Enable	NO
Max ON	
Max OFF	

7 Wire I/C (2-1-5-1)			
Input	Port	Input	Port
RR1		Free	
RR2		D2	
RR3		D3	

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	
Advance Enable	

Cabinet Status (2-1-5-3	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Battery Backup (2-1-5-5)	
Port	Operation
	NORMAL

Y-Coordination (2-1-5-6	
Port C	Port D

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:
- 0 Unused (no output)
- 1-8 Vehicle 1-8
- 9-14 Overlap A-F
- 21-28 Ped 1-8
- 41-47 Special Functions
- 41 Protected Permissive Flashing Phase 1
- 43 Protected Permissive Flashing Phase 3
- 45 Protected Permissive Flashing Phase 5
- 47 Protected Permissive Flashing Phase 7
- 51-57 Special Functions
- 71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6 Channel 9 and 10

INTERVAL CONTROL

Interval Control (3-3-1)	Time	Phase Control (3-3-2) Hold	Force	Advance	Phase Recall (3-3-3) Veh Call	Ped Call	Int Call	Phase Permitted (3-3-4) Phs Permit	Ped Permit	Ovrlap Permit
Step 1		....	....	....	....	....	....	....	....	......
Step 2		....	....	....	....	....	....	....	....	......
Step 3		....	....	....	....	....	....	....	....	......
Step 4		....	....	....	....	....	....	....	....	......
Step 5		....	....	....	....	....	....	....	....	......
Step 6		....	....	....	....	....	....	....	....	......
Step 7		....	....	....	....	....	....	....	....	......
Step 8		....	....	....	....	....	....	....	....	......

Configuration (3-3-5)			
Input	Port	Delay	HRI Cross
1			
2			

HRI

HRI Configuration (3-4)	
RailRoad	51
Line	
Group	

	WAYSIDE	ATC
Subnode		
Device		

TRANSIT PRIORITY

Local Plans (3-E) 1...9 11...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											
Plan 11	Green Factor											
Plan 12	Green Factor											
Plan 13	Green Factor											
Plan 14	Green Factor											
Plan 15	Green Factor											
Plan 16	Green Factor											
Plan 17	Green Factor											
Plan 18	Green Factor											
Plan 19	Green Factor											

Transit Priority Configuration (3-E-A)				Indicator Output	
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	....	0.0	NONE	0	0
Plan 11-19	....	0.0	NONE	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
	....
	....

Free Plans (3-E-E)	
Max Grn Hold	Hold Phase
	....

Access Utilities (9-5)	
Password	***
Timeout	30

YELLOW YIELD COORDINATION

Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	Force-Offs -1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . .	. . . .
Plan D													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . .	. . . .

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
					. . . .	0.0	0.0	0.0	0	0.0	0

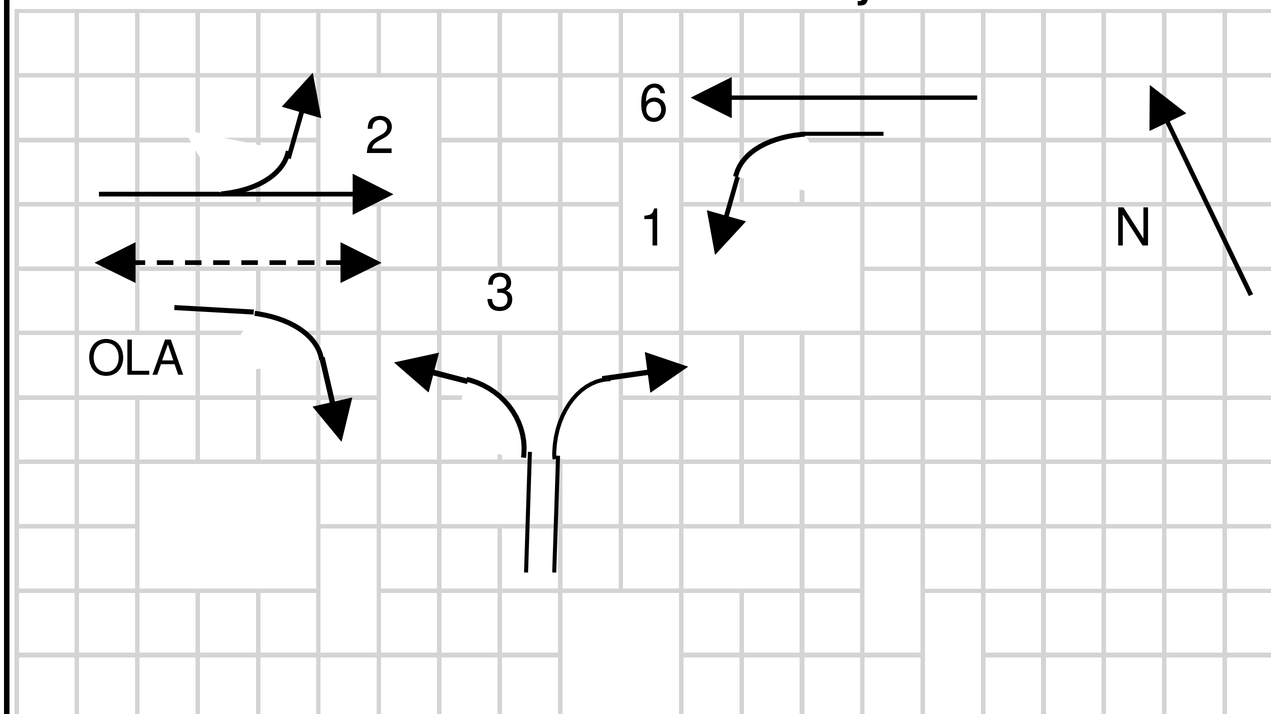
Location: R405 SB @ Carson St		Designed By: HD
System:	District: 07	Installed By: HD
Master At: NB Ramp	I/C: SB-NB Ramp	Service Info:

Timing Change:	Date Start:	Date End:	Designed:	Installed:
	10/29/2020		10/15/2020	10/29/2020

PHASE		FLASH
1)	WBLT Carson St	[ ]
2)	EB Carson St (2 ped)	[ ]
3)	SB off Ramp	[ ]
4)		[ ]
5)		[ ]
6)	WB Carson St	[ ]
7)		[ ]
8)		[ ]

OVERLAP	FLASH
A)	[ ]
B)	[ ]
C)	[ ]
D)	[ ]
E)	[ ]
F)	[ ]

Intersection Layout



Comments and Notes:

* To prevent yellow trap EBLT (phase 1 Place a call to phase 3 by 2-1-2-1)
* OLA (2 color) EBRT on Ramp is on with phase 3

RAM Checksum

Page 2: AA7B	Page 8: 5996
Page 3: 0F2D	Page 9: D2FD
Page 4: 6A0D	Page 10: 22C1
Page 5: 191A	Page 11: C838
Page 6: 191A	Page 12: 1FB3
Page 7: 12D9	Page 13: 86F7

Post Mile: 10.54

Printed: 12/15/2021

CONFIGURATION PHASE FLAGS

Cabinet (9-3)
332
Configuration
CALTRANS

Phases (2-1-1-1)	
Permitted	1 2 3 . . 6 . .
Restricted	. . . .

Phase Features (2-1-1-4)	
Double Entry	. . . .
Rest In Walk	. . . .
Rest In Red	. . . .
Walk 2	. . . .
Max Green 2	. . . .
Max Green 3	. . . .

Startup (2-1-1-5)	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . 3 . . . . .
Vehicle Calls	1 2 3 . . 6 . .
Pedestrian Calls	. 2 . . . . . .
Yellow Start Overlaps	. . . . . .
Startup All-Red	6.0

Phase Recalls (2-1-1-2)	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . .
Pedestrian	. . . .
Bicycle	. . . .

Phase Locks (2-1-1-3)	
Red	1 . . . .
Yellow	. 2 . . . 6 . .
Force/Max	. . . .

Call To Phase (2-1-2-1)		Omit On Green	
1	. . 3	1	. . . .
2	. . . .	2	. . . .
3	. . . .	3	. . . .
4	. . . .	4	. . . .
5	. . . .	5	. . . .
6	. . . .	6	. . . .
7	. . . .	7	. . . .
8	. . . .	8	. . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . .
Yellow Flash Overlaps	. . . . . .
Flash In Red Phases	. . . .
Flash In Red Overlaps	. . . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . .
Driveway Signal Phases	. . . .
Driveway Signal Overlaps	. . . . . .
Leading Ped Phases	. . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . .

Pedestrian (2-1-3)	
P1	. . . .
P2	. 2 . . . . . .
P3	. . . .
P4	. . . 4 . . . .
P5	. . . .
P6	. . . . . 6 . .
P7	. . . .
P8	 8

Overlap (2-1-4)

Overlap	Parent	Omit	No Start	Not
A	. . 3	. . . .	. . . .	. . . .
B	. . . .	. . . .	. . . .	. . . .
C	. . . .	. . . .	. . . .	. . . .
D	. . . .	. . . .	. . . .	. . . .
E	. . . .	. . . .	. . . .	. . . .
F	. . . .	. . . .	. . . .	. . . .

Location: R405 SB @ Carson St **TSCP 3.03**

PHASE TIMING

Phase (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	7	0	10	0	0	0	10
Flash Don't Walk	0	30	0	10	0	0	0	10
Minimum Green	10	10	10	10	10	10	10	10
Det Limit	0	0	0	10	10	0	10	10
Max Initial	0	20	0	10	10	20	10	10
Max Green 1	20	40	25	50	50	40	50	50
Max Green 2	20	40	25	50	50	40	50	50
Max Green 3	20	40	25	50	50	40	50	50
Extension	2.5	4.0	3.0	5.0	5.0	4.0	5.0	5.0
Maximum Gap	2.5	5.0	3.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap	2.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Add Per Vehicle	0.0	2.0	0.0	1.0	1.0	2.0	1.0	1.0
Reduce Gap By	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Reduce Every	0.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Yellow	3.7	4.4	4.1	5.0	5.0	4.4	5.0	5.0
All-Red	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Ped/Bike (2-3)	**-1-**	**-2-**	**-3-**	**-4-**	**-5-**	**-6-**	**-7-**	**-8-**
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	5.0
All-Red Sec/Min (2-6)	
All-Red Sec/Min:	OFF

Max 2 Extension

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

Local Plan 1...9 (7-1) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor	90		....	9			16	37	20			58		
Plan 2	Green Factor	90		....	9			16	37	20			58		
Plan 3	Green Factor	90		....	9			16	37	20			58		
Plan 4	Green Factor			....											
Plan 5	Green Factor			....											
Plan 6	Green Factor			....											
Plan 7	Green Factor			....											
Plan 8	Green Factor			....											
Plan 9	Green Factor			....											

Local Plan 1...9 (7-1) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.2.4.6.8	.2...6..	....	....	....	....	.2......	....
Plan 2	.2.4.6.8	.2...6..	....	....	....	....	.2......	....
Plan 3	.2.4.6.8	.2...6..	....	....	....	....	.2......	....
Plan 4	....	....	....	....	....	....	....	....
Plan 5	....	....	....	....	....	....	....	....
Plan 6	....	....	....	....	....	....	....	....
Plan 7	....	....	....	....	....	....	....	....
Plan 8	....	....	....	....	....	....	....	....
Plan 9	....	....	....	....	....	....	....	....

Master Timer Sync (7-A)	
Enable in Plans	
1-9	....
11-19	....
21-29	....

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
.2.4.6.8	....
Veh Min	Veh Max
.2...6..	....
Ped	Bike
....	....
Cond	Cond Grn
....	10

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-29
254 = Flash
255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

Local Plan 11...19 (7-2) TIMING DATA

COORDINATION

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
					[Offsets]			Green Factors or Press [F] to Select Force-Off							
Plan 11	Green Factor			....											
Plan 12	Green Factor			....											
Plan 13	Green Factor			....											
Plan 14	Green Factor			....											
Plan 15	Green Factor			....											
Plan 16	Green Factor			....											
Plan 17	Green Factor			....											
Plan 18	Green Factor			....											
Plan 19	Green Factor			....											

Local Plan 11...19 (7-2) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 11	....	....	....	....	....	....	....	....
Plan 12	....	....	....	....	....	....	....	....
Plan 13	....	....	....	....	....	....	....	....
Plan 14	....	....	....	....	....	....	....	....
Plan 15	....	....	....	....	....	....	....	....
Plan 16	....	....	....	....	....	....	....	....
Plan 17	....	....	....	....	....	....	....	....
Plan 18	....	....	....	....	....	....	....	....
Plan 19	....	....	....	....	....	....	....	....

Local Plan 21...29 (7-3) TIMING DATA

COORDINATION

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
					[Offsets]			Green Factors or Press [F] to Select Force-Off							
Plan 21	Green Factor			....											
Plan 22	Green Factor			....											
Plan 23	Green Factor			....											
Plan 24	Green Factor			....											
Plan 25	Green Factor			....											
Plan 26	Green Factor			....											
Plan 27	Green Factor			....											
Plan 28	Green Factor			....											
Plan 29	Green Factor			....											

Local Plan 21...29 (7-3) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 21	....	....	....	....	....	....	....	....
Plan 22	....	....	....	....	....	....	....	....
Plan 23	....	....	....	....	....	....	....	....
Plan 24	....	....	....	....	....	....	....	....
Plan 25	....	....	....	....	....	....	....	....
Plan 26	....	....	....	....	....	....	....	....
Plan 27	....	....	....	....	....	....	....	....
Plan 28	....	....	....	....	....	....	....	....
Plan 29	....	....	....	....	....	....	....	....

DETECTORS

Det	Type	Phases	Lock	Slot	Det	Delay	Extend	Recall	Port
1	COUNT+CALL+EXTEND	1.......	NO	I1U	1			10	3.2
2	COUNT+CALL+EXTEND	1.......	NO	I1L	2			10	7.2
3	COUNT+CALL+EXTEND	.2......	NO	I2U	3			10	1.1
4	COUNT+CALL+EXTEND	.2......	NO	I2L	4			10	1.5
5	COUNT+CALL+EXTEND	.2......	NO	I3U	5			10	4.5
6	CALL+EXTEND	.2......	NO	I3L	6			10	6.2
7	LIMITED	.2......	NO	I4U	7			10	2.1
8	COUNT+CALL+EXTEND	.2......	NO	I4L	8			10	7.4
9	COUNT+CALL+EXTEND	..3.....	NO	I5U	9			10	3.4
10	COUNT+CALL+EXTEND	..3.....	NO	I5L	10			10	7.6
11	COUNT+CALL+EXTEND	...4....	NO	I6U	11			10	1.3
12	COUNT+CALL+EXTEND	...4....	NO	I6L	12			10	1.7
13	COUNT+CALL+EXTEND	...4....	NO	I7U	13			10	4.7
14	CALL+EXTEND	...4....	NO	I7L	14			10	6.4
15	LIMITED	...4....	NO	I8U	15			10	2.3
16	COUNT+CALL+EXTEND	...4....	NO	I8L	16			10	7.8
17	COUNT+CALL+EXTEND	1.......	NO	I9U	17			10	3.6
18	COUNT+CALL+EXTEND	..3.....	NO	I9L	18			10	3.8
19	COUNT+CALL+EXTEND	.2......	NO	I10U	19			10	4.1
20	COUNT+CALL+EXTEND	...4....	NO	I10L	20			10	4.2
21	COUNT+CALL+EXTEND	....5...	NO	J1U	21			10	3.1
22	COUNT+CALL+EXTEND	....5...	NO	J1L	22			10	7.1
23	COUNT+CALL+EXTEND	.....6..	NO	J2U	23			10	1.2
24	COUNT+CALL+EXTEND	.....6..	NO	J2L	24			10	1.6
25	COUNT+CALL+EXTEND	.....6..	NO	J3U	25			10	4.6
26	CALL+EXTEND	.....6..	NO	J3L	26			10	6.3
27	LIMITED	.....6..	NO	J4U	27			10	2.2
28	COUNT+CALL+EXTEND	.....6..	NO	J4L	28			10	7.3
29	COUNT+CALL+EXTEND	......7.	NO	J5U	29			10	3.3
30	COUNT+CALL+EXTEND	......7.	NO	J5L	30			10	7.5
31	COUNT+CALL+EXTEND	8	NO	J6U	31			10	1.4
32	COUNT+CALL+EXTEND	8	NO	J6L	32			10	1.8
33	COUNT+CALL+EXTEND	8	NO	J7U	33			10	4.8
34	CALL+EXTEND	8	NO	J7L	34			10	6.5
35	LIMITED	8	NO	J8U	35			10	2.4
36	COUNT+CALL+EXTEND	8	NO	J8L	36			10	7.7
37	COUNT+CALL+EXTEND	....5...	NO	J9U	37			10	3.5
38	COUNT+CALL+EXTEND	......7.	NO	J9L	38			10	3.7
39	COUNT+CALL+EXTEND	.....6..	NO	J10U	39			10	4.3
40	COUNT+CALL+EXTEND	8	NO	J10L	40			10	4.4
41	PEDESTRIAN	.2......	NO	I12U	41			10	5.1
42	PEDESTRIAN	...4....	NO	I12L	42			10	5.3
43	PEDESTRIAN	.....6..	NO	I13U	43			10	5.2
44	PEDESTRIAN	8	NO	I13L	44			10	5.4

Detector Attributes (5-1) | Slot | Detector Configuration (5-2)

Failure Times(5-3)	Minutes
Maximum On Time	
Fail Reset Time	

Failure Override (5-4)	
Detectors 1-8	....
Detectors 9-16	....
Detectors17-24	....
Detectors 25-32	....
Detectors 33-40	....
Detectors 41-44	....

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Nu								
Sys Det	9	10	11	12	13	14	15	16
Det Nu								

CIC Operation (5-6-1)	
Enable in Plans	....

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.00	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase								
Sys Det	9	10	11	12	13	14	15	16
Phase								

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6	4.1	6.6	5.1	5.2	6.7
	7.2	1.5	6.2	7.4	7.6	1.7	6.4	7.8	3.8	4.2	2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5	4.3	2.8	5.5	5.6	2.5
	7.1	1.6	6.3	7.3	7.5	1.8	6.5	7.7	3.7	4.4	6.1	5.7	5.8	2.6

TOD SCHEDULE

Table 1 (8-2-1)		
Time	Plan	OS
0600	2	A
0900	255	A
1500	3	A
1800	1	A
2000	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)		
Time	Plan	OS
0630	1	A
0900	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1			....	
2			....	
3			....	
4			....	
5			....	
6			....	
7			....	
8			....	
9			....	
10			....	
11			....	
12			....	
13			....	
14			....	
15			....	
16			....	

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1			....	
2			....	
3			....	
4			....	
5			....	
6			....	
7			....	
8			....	
9			....	
10			....	
11			....	
12			....	
13			....	
14			....	
15			....	
16			....	

Daylight Saving (8-1)

Enabled	YES

	Month	Sunday
Start	MAR	2nd
End	NOV	1st

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	....
Holiday	....

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1			....		....
2			....		....
3			....		....
4			....		....
5			....		....
6			....		....
7			....		....
8			....		....
9			....		....
10			....		....
11			....		....
12			....		....
13			....		....
14			....		....
15			....		....
16			....		....

Action Codes:
0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11.Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting
100+Action Code = Phases removed
200+Action Code = Phases replaced

COMMUNICATIONS

	C2 (6-1-1)	C20 (6-1-2)	C21 (6-1-3)
Address	1		
Baud	1200	1200	1200
Protocol	AB3418	AB3418	AB3418
Data Bits	8	8	8
Parity	NONE	NONE	NONE
Stop Bits	1	1	1
RTS On Time	20	20	20
RTS Off Time	20	20	20
Handshaking	NORMAL	NORMAL	NORMAL
Access Level	0	0	0

CALLBACK NUMBERS

Callback Numbers (6-3...3)

Line Out			
Long Distance			
Local Toll			
Delay	10	10	10
Area Code			
Phone Number			

SOFT LOGIC

Soft Logic (6-2)

#	Data	OP	Data	OP	Data	OP	Data
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

*Refer to User's Manual for Data and OP Codes

NETWORK

Network Parameters (6-4)

Address	
Protocol	AB3418
Port	27000
Type	STATIC
Central Access	
Field Access	
ATSPM	OFF

IP Address	0	0	0	0
Netmask	255	255	255	0
Broadcast	0	0	0	255
Gateway	0	0	0	254

Access Levels:

0-Full Access
1-Status Only
2-Status, Set Pattern, Time
3-Status, Set Pattern, Time, Manual Plan
4-Reserved
5-Full Access with No Set Pattern
6-Full Access with No Set Time
7-Full Access with No Set Pattern, Manual Plan
8-Full Access with No Set Time, Pattern, Manual Plan

SPAT Network (6-5)

SPAT	1	2
Protocol	NONE	NONE
UDP Port	0	0

IP Address 0 . 0 . 0 . 0

RAILROAD PREEMPTION

RR 1

Timing (3-1-1)	
Clear 1	15
Clear 2	5
Clear 3	
Hold	
Min Gr	
Delay	
Exit	
Ped Clr	

Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
. 2 . . 5 . . .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. 2 . . 5 . . .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . . . .	. . . . . .	. . . . . .
1 . . 4 . . 7 8	. . . .	. . . .	. . . .	. . . 4 . . . 8	. 2 . . . 6 . .	. . . . . .	. . . . . .	. . . . . .

Exit Parameters (3-1-5)			
Phase Green	Ovrlap Green	Veh Permit/Call	Ped Permit/Call
. 2 . . . 6 . .	. . . . . .	1 2 3 4 5 6 7 8	. 2 . 4 . 6 . 8

Configuration (3-1-6)	PR	XR	Gate	Isld	APP	Sign	Sign	Max On	Latching
1								5	NO
2									

Valid Inputs: 1.x, 2.x, 3.x, 4.x, 5.x, 6.x, 7.x, 8.x x=1 to 8
Valid Outputs: 11.x, 12.x, 13.x, 14.x, 15.x, 16.x, 17.x, 18.x x=1 to 8

RR 2

Timing (3-2-1)	
Clear 1	15
Clear 2	5
Clear 3	
Hold	
Min Gr	
Delay	
Exit	
Ped Clr	

Phase Flags (3-2-2)			Pedestrian Flags (3-2-3)			Overlap Flags (3-2-4)		
Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
. . . 4 . . 7 .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . 4 . . 7 .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . . . .	. . . . . .	. . . . . .
1 2 3 . . 6 . .	. . . .	. . . .	. . . .	. 2 . . . 6 . .	. . . 4 . . . 8	. . . . . .	. . . . . .	. . . . . .

Exit Parameters (3-2-5)			
Phase Green	Ovrlap Green	Veh Permit	Ped Permit
. 2 . . . 6 . .	. . . . . .	1 2 3 4 5 6 7 8	. 2 . 4 . 6 . 8

Configuration (3-2-6)	PR	XR	Gate	Isld	APP	Sign	Sign	Max On	Latching
1								5	NO
2									

Valid Inputs: 1.x, 2.x, 3.x, 4.x, 5.x, 6.x, 7.x, 8.x x=1 to 8
Valid Outputs: 11.x, 12.x, 13.x, 14.x, 15.x, 16.x, 17.x, 18.x x=1 to 8

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	. 2 . . 5 . . .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVB (3-B)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	. . . 4 . . 7 .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVC (3-C)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	1 . . . . 6 . .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVD (3-D)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	. . 3 8	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

INPUTS

Enable	NO
Max ON	
Max OFF	

7 Wire I/C (2-1-5-1)			
Input	Port	Input	Port
RR1		Free	
RR2		D2	
RR3		D3	

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	
Advance Enable	

Cabinet Status (2-1-5-3	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Battery Backup (2-1-5-5)	
Port	Operation
	NORMAL

Y-Coordination (2-1-5-6	
Port C	Port D

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:
- 0 Unused (no output)
- 1-8 Vehicle 1-8
- 9-14 Overlap A-F
- 21-28 Ped 1-8
- 41-47 Special Functions
- 41 Protected Permissive Flashing Phase 1
- 43 Protected Permissive Flashing Phase 3
- 45 Protected Permissive Flashing Phase 5
- 47 Protected Permissive Flashing Phase 7
- 51-57 Special Functions
- 71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6 Channel 9 and 10

INTERVAL CONTROL

Interval Control (3-3-1)	Time	Phase Control (3-3-2) Hold	Force	Advance	Phase Recall (3-3-3) Veh Call	Ped Call	Int Call	Phase Permitted (3-3-4) Phs Permit	Ped Permit	Ovrlap Permit
Step 1		....	....	....	....	....	....	....	....	......
Step 2		....	....	....	....	....	....	....	....	......
Step 3		....	....	....	....	....	....	....	....	......
Step 4		....	....	....	....	....	....	....	....	......
Step 5		....	....	....	....	....	....	....	....	......
Step 6		....	....	....	....	....	....	....	....	......
Step 7		....	....	....	....	....	....	....	....	......
Step 8		....	....	....	....	....	....	....	....	......

Configuration (3-3-5)			
Input	Port	Delay	HRI Cross
1			
2			

HRI

HRI Configuration (3-4)	
RailRoad	51
Line	
Group	

	WAYSIDE	ATC
Subnode		
Device		

TRANSIT PRIORITY

Local Plans (3-E) 1...9 11...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											
Plan 11	Green Factor											
Plan 12	Green Factor											
Plan 13	Green Factor											
Plan 14	Green Factor											
Plan 15	Green Factor											
Plan 16	Green Factor											
Plan 17	Green Factor											
Plan 18	Green Factor											
Plan 19	Green Factor											

Transit Priority Configuration (3-E-A)				Indicator Output	
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	. . . .	0.0	NONE	0	0
Plan 11-19	. . . .	0.0	NONE	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
	. . . .
	. . . .

Free Plans (3-E-E)	
Max Grn Hold	Hold Phase
	. . . .

Access Utilities (9-5)	
Password	***
Timeout	30

YELLOW YIELD COORDINATION

Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	Force-Offs -1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . .	. . . .
Plan D													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . .	. . . .

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
					. . . .	0.0	0.0	0.0	0	0.0	0

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10 HCH By: PMP

T.S. No.: 4028 Date Implemented: ______ By: ______

1. CONFIGURATION SUBMENU

1. CONTROLLER SEQUENCE

	1	2	3	4	5	6	7	8	9	10	11	12
PRIORITY	1	2	3	4	5	6	7	8	9	10	11	12
RING 1	1	2	3	4								
RING 2	5	6	7	8								
CG (CONCURRENT GROUPS)		X		X								

2. PHASES IN USE

	PHASE NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
PHASES IN USE	X	X	X	X	X	X	X	X				
EXCLUSIVE PED												

3. PHASE TO LOAD SWITCH (MMU) ASSIGNMENT

LOAD SWITCH (MMU)	SIGNAL DRIVER GROUP		LOAD SWITCH (MMU)	SIGNAL DRIVER GROUP	
CHANNEL	PHASE/OVLP	PED	CHANNEL	PHASE/OVLP	PED
1	1		9	2	X
2	2		10	4	X
3	3		11	6	X
4	4		12	8	X
5	5		13		
6	6		14		
7	7		15		
8	8		16		

4. SDLC OPTIONS/ENABLES

	BIU NUMBER							
	1	2	3	4	5	6	7	8
TERM & FACIL								
DETECTOR RACK								

TYPE 2 RUNS AS TYPE 1	
MMU DISABLE	X
DIAGNOSTIC ENABLE (TEST FIXTURE)	
PEER TO PEER ENABLE	

PEER TO PEER ADDRESS:

1)		2)		3)		4)		5)	
6)		7)		8)		9)		10)	

5. PORT 2 CONFIGURATION

PORT 2 PROTOCOL	
PORT 2 ENABLE	
AB3418 ADDRESS	
AB3418 GROUP ADDRESS	
AB3418 RESPONSE DELAY	
AB3418 SINGLE FLAG ENABLE	
AB3418 DROP-OUT TIME	
AB3418 TOD SF SELECT	
DATA RATE (BPS)	
DATA, PARITY, STOP	

6. PORT 3 CONFIGURATION

PORT 3 PROTOCOL	
PORT 3 ENABLE	
TELEMETRY ADDRESS	
SYSTEM DETECTOR 9-16 ADDRESS	
TELEMETRY RESPONSE DELAY	
AB3418 ADDRESS	
AB3418 GROUP ADDRESS	
AB3418 RESPONSE DELAY	
AB3418 SINGLE FLAG ENABLE	
AB3418 DROP-OUT TIME	
AB3418 TOD SF SELECT	
ADDITIONAL SCREEN(S)	
DUPLEX -- HALF OR FULL	
MODEM DATA RATE (BPS)	
DATA, PARITY, STOP	

LOS ANGELES COUNTY
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TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

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PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10 HCH By: PMP

T.S. No.: 4028 Date Implemented: ______ By: ______

1. CONFIGURATION SUBMENU (Continued)

7. ENABLE EVENT LOGS

CRITICAL RFE'S (MMU/TF)	
NON-CRITICAL RFE'S(DET/TEST)	
DETECTOR ERRORS	
COORDINATION ERRORS	
MMU FLASH FAULTS	
LOCAL FLASH FAULTS	
PREEMPT	
POWER ON/OFF	
LOW BATTERY	
SPARE	
ALARM 1	
ALARM 2	
ALARM 3	
ALARM 4	
ALARM 5	
ALARM 6	
ALARM 7	
ALARM 8	
ALARM 9	
ALARM 10	
ALARM 11	
ALARM 12	
ALARM 13	
ALARM 14	
ALARM 15	
ALARM 16	

8. OPTIONS

SUPERVISOR ACCESS CODE	
DATA CHANGE ACCESS CODE	
KEY CLICK ENABLE	
BACKLIGHT ENABLE	

9. MMU PROGRAM CAN SERVE WITH

PHASE	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave.

Date Prepared: 8-11-10 HcH By: PMP

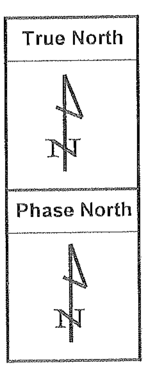
T.S. No.: 4028

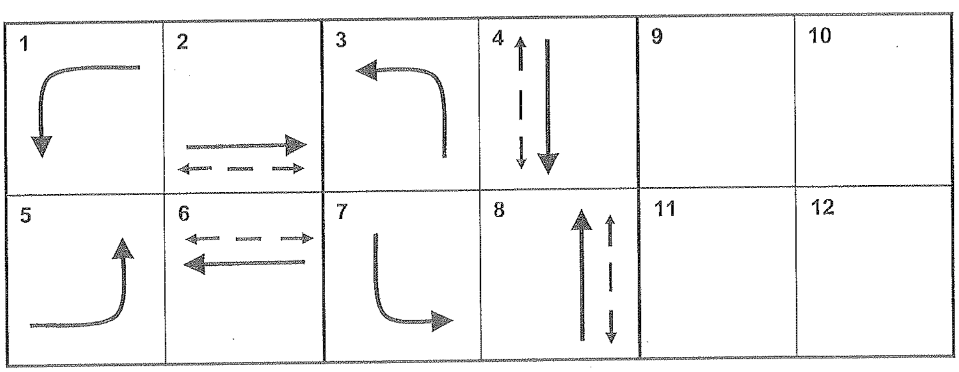
Date Implemented: ________ By: ________

2. CONTROLLER SUBMENU

1. CONTROLLER TIMING DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MIN GREEN	4	6	4	6	4	6	4	6				
BIKE GREEN	0	0	0	0	0	0	0	0				
CS MIN GREEN	0	0	0	0	0	0	0	0				
WALK	0	7	0	7	0	7	0	7				
PED CLEAR	0	19	0	19	0	18	0	18				
VEH EXT	1.5	4.0	1.5	4.0	1.5	4.0	1.5	4.0				
VEH EXT 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
MAX EXT	0	0	0	0	0	0	0	0				
MAX 1	20	50	20	50	20	50	20	50				
MAX 2	20	130	20	50	20	130	20	50				
MAX 3	0	0	0	0	0	0	0	0				
DET MAX	0	0	0	0	0	0	0	0				
YELLOW	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5				
RED CLEAR	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				
RED REVERT	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				
ACT B4	0	0	0	0	0	0	0	0				
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
MAX INITIAL	0	0	0	0	0	0	0	0				
TIME B4 REDUCTION	0	15	0	15	0	15	0	15				
CARS WT	0	255	0	255	0	255	0	255				
TIME TO REDUCE	0	15	0	15	0	15	0	15				
MIN GAP	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0				





COMMENTS:

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10 HCH By: PMP

T.S. No.: 4028 Date Implemented: ____ By: ____

2. CONTROLLER SUBMENU (Continued)

2. PHASE OVERLAP ASSIGNMENTS

	OVERLAP CONSISTS OF PHASES:											
OVLP PHASE	1	2	3	4	5	6	7	8	9	10	11	12
1	X											
2		X										
3			X									
4				X								
5					X							
6						X						
7							X					
8								X				
9									X			
10										X		
11											X	
12												X

3. PED TIMING CARRYOVER

PHASE	CARRYOVER PHASE	PHASE	CARRYOVER PHASE
1		7	
2		8	
3		9	
4		10	
5		11	
6		12	

4. CONTROLLER RECALL DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
LOCKING MEMORY		X		X		X		X				
VEH RECALL		X				X						
PED RECALL												
RECALL TO MAX												
SOFT RECALL												
DON'T REST HERE												
PED DARK N/CALL												

LOS ANGELES COUNTY
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T.S. No.: 4028 Date Implemented: ______ By: ______

(NOT USED)

2. CONTROLLER SUBMENU (Continued)

5. CONTROLLER OVERLAP DATA

OVERLAP A	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN												
LAG/LEAD GREEN												
LAG/LEAD YELLOW												
LAG/LEAD RED TIMER												

OVERLAP B	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN												
LAG/LEAD GREEN												
LAG/LEAD YELLOW												
LAG/LEAD RED TIMER												

OVERLAP C	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN												
LAG/LEAD GREEN												
LAG/LEAD YELLOW												
LAG/LEAD RED TIMER												

OVERLAP D	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN												
LAG/LEAD GREEN												
LAG/LEAD YELLOW												
LAG/LEAD RED TIMER												

PED OVERLAP ASSIGNMENTS
OVERLAP CONSISTS OF PHASES:

OVLP PHASE	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

LOS ANGELES COUNTY
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2. CONTROLLER SUBMENU (Continued)

6. CONTROLLER START/FLASH DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
POWER START		X				X						
EXTERNAL START		X				X						
ENTRY REM FLASH												
EXIT REM FLASH												
REM FLASH YELLOW												
FL TOGETHER PHS												
FL TOGETHER OVLPS	A			B			C			D		

POWER START	YELLOW
EXTERNAL START	YELLOW
POWER START ALL RED TIME	0
POWER START FLASH TIME	0
REMOTE FLASH OPTIONS:	
OUT OF FLASH YELLOW	
OUT OF FLASH RED	
MINIMUM RECALL	
USE ALTERNATE FLASH	
FLASH THRU LOAD SWITCHES	
CYCLE THROUGH PHASES	
YELLOW FLASH MAIN STREET	

7. NO SERVE PHASE

PHASE	12	11	10	9	8	7	6	5	4	3	2
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											

8. DIMMING

LOAD SWITCH	1	2	3	4	5	6	7	8
DIM GRN/WALK								
DIM YEL/PC								
DIM RED/DW								
LOAD SWITCH	9	10	11	12	13	14	15	16
DIM GRN/WALK								
DIM YEL/PC								
DIM RED/DW								

9. CONTROLLER OPTION DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
GUAR PASSAGE												
NON ACTUATED I												
NON ACTUATED II												
DUAL ENTRY												
COND SERVICE												
COND RESERVICE												
REST IN WALK												
FLASHING WALK												

FIVE SECTION LEFT TURN HEADS
(SPECIAL PROGRAM OPTION FOR STATE OF ILLINOIS)

5 - 2		7 - 4		1 - 6	
3 - 8		11 - 10		9 - 12	

DUAL ENTRY		RESERVED	
COND SERVICE ENABLE		BACKUP PROTECTION GROUP 1	
COND SERVICE DET X SWITCHING		BACKUP PROTECTION GROUP 2	
PED CLEAR PROTECT		BACKUP PROTECTION GROUP 3	
SPEC PREEMPT OVLP FLASH		SIMULTANEOUS GAP GROUP 1	ON
LOCK DETECTORS IN RED ONLY		SIMULTANEOUS GAP GROUP 2	ON
RESERVED		SIMULTANEOUS GAP GROUP 3	

LOS ANGELES COUNTY
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PROGRAM REFERENCE CARD

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T.S. No.: 4028 Date Implemented: ______ By: ______

3. COORDINATION SUBMENU

TIME OF DAY OPERATION SUMMARY					
PLAN 1	0900 - 1500 M-F 1800 - 2100 M-F	PLAN 4		PLAN 7	
PLAN 2	0600 - 0900 M-F	PLAN 5		PLAN 8	
PLAN 3	1500 - 1800 M-F	PLAN 6		PLAN 9	
FREE	ALL OTHER TIMES				

1. COORDINATOR OPTIONS

SPLIT UNITS	SEC	ACTUATED COORD PHASE(S)	X
OFFSET UNITS	SEC	ACTUATED WALK/REST	
INTERCONNECT FORMAT	STD	INHIBIT MAX	
INTERCONNECT SOURCE	NIC	MAX 2 SELECT	X
RESYNC COUNT	255	MULTISYNC	
TRANSITION	SMOOTH	FLOAT FORCE OFF	
DWELL PERIOD	255		

FREE ALTERNATE SEQUENCE	A	B	C	D	E	F

2. COORD MANUAL AND SPLIT DEMAND

MANUAL ENABLE		MANUAL PATTERN	

SPLIT DEMAND:	DEMAND 1	DEMAND 2
DEMAND CALL TIME	0	0
DEMAND CYCLE COUNT	0	0

DEMAND PHASE	1	2	3	4	5	6	7	8	9	10	11	12
DEMAND 1 PHASE												
DEMAND 2 PHASE												

3. COORD AUTO PERM MIN GREEN

PHASE	AUTO PERM MIN GREEN	PHASE	AUTO PERM MIN GRN
1	7	7	7
2	7	8	7
3	7	9	
4	7	10	
5	7	11	
6	7	12	

LOS ANGELES COUNTY
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Date Prepared: 8-11-10/HCH By: PMP

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Date Implemented: ______ By: ______

3. COORDINATION SUBMENU (Continued)

4. PATTERN DATA

STD FORMAT

COORD PATTERN	1	OFFSET	5
CYCLE LENGTH	120	C/O/S	1/1/1

PLAN FORMAT

COORD PATTERN		OFFSET	
CYCLE LENGTH		PLAN	

TS2 FORMAT

COORD PATTERN		TIMING PLAN						
CYCLE LENGTH		OFFSETS	1		2		3	

SPLITS							
PHASE 1	19	PHASE 2	15	PHASE 3	16	PHASE 4	38
PHASE 5	19	PHASE 6	15	PHASE 7	16	PHASE 8	38
PHASE 9		PHASE 10		PHASE 11		PHASE 12	
VEH PERMISSIVE	[1]	0	[2]	0			
VEH PERM 2 DISP							
PHASE RESERVICE							
SPLIT EXTENSION/RING	[1]	31	[2]	31			
SPL DMD PATTERN	[1]		[2]				
XARTERY PATTERN							

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

STD FORMAT

COORD PATTERN	2	OFFSET	5
CYCLE LENGTH	120	C/O/S	2/1/1

PLAN FORMAT

COORD PATTERN		OFFSET	
CYCLE LENGTH		PLAN	

TS2 FORMAT

COORD PATTERN		TIMING PLAN						
CYCLE LENGTH		OFFSETS	1		2		3	

SPLITS							
PHASE 1	16	PHASE 2	15	PHASE 3	16	PHASE 4	38
PHASE 5	16	PHASE 6	15	PHASE 7	16	PHASE 8	38
PHASE 9		PHASE 10		PHASE 11		PHASE 12	
VEH PERMISSIVE	[1]	0	[2]	0			
VEH PERM 2 DISP							
PHASE RESERVICE							
SPLIT EXTENSION/RING	[1]	31	[2]	31			
SPL DMD PATTERN	[1]		[2]				
XARTERY PATTERN							

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

LOS ANGELES COUNTY
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Date Prepared: 8-11-10HCH By: PMP

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Date Implemented: ______ By: ______

3. COORDINATION SUBMENU (Continued)

4. PATTERN DATA (Continued)

STD FORMAT

COORD PATTERN	3	OFFSET	5
CYCLE LENGTH	120	C/O/S	3/1/1

PLAN FORMAT

COORD PATTERN		OFFSET	
CYCLE LENGTH		PLAN	

TS2 FORMAT

COORD PATTERN		TIMING PLAN						
CYCLE LENGTH		OFFSETS	1		2		3	

SPLITS							
PHASE 1	19	PHASE 2	15	PHASE 3	19	PHASE 4	33
PHASE 5	19	PHASE 6	15	PHASE 7	19	PHASE 8	33
PHASE 9		PHASE 10		PHASE 11		PHASE 12	
VEH PERMISSIVE	[1] 0			[2] 0			
VEH PERM 2 DISP							
PHASE RESERVICE							
SPLIT EXTENSION/RING	[1] 33			[2] 33			
SPL DMD PATTERN	[1]			[2]			
XARTERY PATTERN							

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

STD FORMAT

COORD PATTERN		OFFSET	
CYCLE LENGTH		C/O/S	

PLAN FORMAT

COORD PATTERN		OFFSET	
CYCLE LENGTH		PLAN	

TS2 FORMAT

COORD PATTERN		TIMING PLAN						
CYCLE LENGTH		OFFSETS	1		2		3	

SPLITS							
PHASE 1		PHASE 2		PHASE 3		PHASE 4	
PHASE 5		PHASE 6		PHASE 7		PHASE 8	
PHASE 9		PHASE 10		PHASE 11		PHASE 12	
VEH PERMISSIVE	[1]			[2]			
VEH PERM 2 DISP							
PHASE RESERVICE							
SPLIT EXTENSION/RING	[1]			[2]			
SPL DMD PATTERN	[1]			[2]			
XARTERY PATTERN							

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES												
VEHICLE RECALL												
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

LOS ANGELES COUNTY
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(NOT USED)

4. PREEMPTOR SUBMENU

1. PRIORITY PREEMPTOR 1

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			

2. PRIORITY PREEMPTOR 2

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

3. PRIORITY PREEMPTOR 3

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

4. PRIORITY PREEMPTOR 4

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
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T.S. No.: 4028 Date Implemented: ______ By: ______

(NOT USED)

4. PREEMPTOR SUBMENU (Continued)

5. PRIORITY PREEMPTOR 5

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

6. PRIORITY PREEMPTOR 6

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

7. BUS PREEMPTORS

	BUS PREEMPTOR			
	1	2	3	4
PREEMPTOR ACTIVE				
DETECTOR LOCK				
MAXIMUM TIME				
RESERVICE TIME				
DELAY TIME				
INHIBIT TIME				
ENTRANCE GREEN				
ENTRANCE PED CLEAR				
ENTRANCE YELLOW				
ENTRANCE RED				
MIN HOLD TIME				

	HOLD PHASE											
	1	2	3	4	5	6	7	8	9	10	11	12
PREEMPTOR 1												
PREEMPTOR 2												
PREEMPTOR 3												
PREEMPTOR 4												

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
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TRAFFIC SIGNAL TIMING

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T.S. No.: 4028 Date Implemented: ______ By: ______

5. NIC/TOD SUBMENU

1. NIC/TOD CLOCK/CALENDAR DATA

DATE SET	
TIME SET	
MANUAL NIC PROGRAM STEP	0
MANUAL TOD PROGRAM STEP	0
SYNC REFERENCE TIME	★ ★ 0000
SYNC REFERENCE	REFERENCE TIME
WEEK 1 BEGINS ON 1ST SUNDAY	
DISABLE DAYLIGHT SAVINGS	
DST BEGINS LAST SUNDAY	

2. NIC/TOD WEEKLY PROGRAMS

WEEK	SUN	MON	TUE	WED	THU	FRI	SAT
1	2	1	1	1	1	1	2
2							
3							
4							
5							
6							
7							
8							
9							
10							

3. NIC/TOD YEARLY PROGRAMS

WEEK OF YEAR	1	2	3	4	5	6	7	8
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	9	10	11	12	13	14	15	16
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	17	18	19	20	21	22	23	24
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	25	26	27	28	29	30	31	32
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	33	34	35	36	37	38	39	40
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	41	42	43	44	45	46	47	48
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR				49	50	51	52	53
WEEKLY PROGRAM				1	1	1	1	1

4. NIC/TOD HOLIDAY PROGRAM

HOLIDAY	FLOAT/FIXED	MON/MON	DOW/DOM	WOM/YEAR	PROG
1	FIXED	1	1	0	2
2	FIXED	7	4	0	2
3	FIXED	11	11	0	2
4	FIXED	12	24	0	2
5	FIXED	12	25	0	2
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					

★ ★ NOTE: When using RCTB Unit, in order for the controller clock to be properly updated, the RCTB Unit must be designed for a 03:30 AM Sync Pulse.

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
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TRAFFIC SIGNAL TIMING

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T.S. No.: 4028 Date Implemented: By:

5. NIC/TOD SUBMENU (Continued)

5. NIC PROGRAM STEP

STEP	PGM	TIME	PATTERN	OVERRIDE
1	1	0000	0	
2	2	0000	0	
3	1	0600	2	
4	1	0900	1	
5	1	1500	3	
6	1	1800	1	
7	1	2100	0	

LOS ANGELES COUNTY
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ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave.

Date Prepared: 8-11-10 Hclt By: pmp

T.S. No.: 4028

Date Implemented: ______ By: ______

(NOT USED)

5. NIC/TOD SUBMENU (Continued)

6. TOD PROGRAM STEPS

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave.

Date Prepared: 8-11-10 Hch By: PMP

T.S. No.: 4028

Date Implemented: ______ By: ______

(NOT USED)

5. NIC/TOD SUBMENU (Continued)

6. TOD PROGRAM STEPS (CONTINUED)

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10 HCH By: PMP

T.S. No.: 4028 Date Implemented: ______ By: ______

6. DETECTORS SUBMENU

1. DETECTOR TYPE/TIMERS

DETECTOR	TYPE	LOCK	EXTEND	DELAY	NO RESET	LOG ENABLE
1	0					
2	0					
3	0					
4	0					
5	5		2.0			
6	5		2.0			
7	5		2.0			
8	5		2.0			
9	0					
10	0					
11	0					
12	0					
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

2. DETECTOR PHASE ASSIGNMENT

	PHASE ASSIGNMENT											
DETECTOR	1	2	3	4	5	6	7	8	9	10	11	12
1			X									
2							X					
3	X											
4					X							
5				X								
6								X				
7		X										
8						X						
9						X						
10								X				
11		X										
12				X								
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												

3. PED AND SYSTEM DETECTOR LOCAL ASSIGNMENT

DETECTOR LOG INTERVAL				MINUTES		
LOCAL PED DET NUMBER	PHASE PED DETECTOR					
	1	2	3	4	5	6
		2		4		6
	7	8	9	10	11	12
NUMBER		8				
LOCAL PED DET NUMBER	LOCAL SYSTEM DETECTOR NUMBER					
	1	2	3	4	5	6
	7	8	9	10	11	12
NUMBER						

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
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ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10 HC/+ By: Pmp

T.S. No.: 4028 Date Implemented: ______ By: ______

(NOT USED)

6. DETECTORS SUBMENU (Continued)

4. CROSS SWITCHING

DETECTOR	PHASES 1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												

6. VEHICLE DETECTOR DIAGNOSTIC PLAN

PLAN	DET NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	DIAG NO																
	SCALING																
2	DIAG NO																
	SCALING																
3	DIAG NO																
	SCALING																
4	DIAG NO																
	SCALING																
5	DIAG NO																
	SCALING																
6	DIAG NO																
	SCALING																
7	DIAG NO																
	SCALING																
8	DIAG NO																
	SCALING																
FINAL ACTION																	

PLAN	DET NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	DIAG NO																
	SCALING																
2	DIAG NO																
	SCALING																
3	DIAG NO																
	SCALING																
4	DIAG NO																
	SCALING																
5	DIAG NO																
	SCALING																
6	DIAG NO																
	SCALING																
7	DIAG NO																
	SCALING																
8	DIAG NO																
	SCALING																
FINAL ACTION																	

5. SPEED DETECTORS

SPEED DETECTOR NUMBERS	1	2	3	4	5	6	7	8
ONE DETECTOR SPEED:								
LOCAL DET NUMBER								
VEHICLE LENGTH								
LOOP LENGTH								
TWO DETECTOR SPEED:								
LOCAL DET NUMBER								
SPEED TRAP								
ENABLE LOG								
UNITS:								

7. PED DETECTOR DIAGNOSTIC PLAN

PLAN	DET NO.	1	2	3	4	5	6	7	8	9	10	11	12
1	DIAG NO.												
	SCALING												
2	DIAG NO.												
	SCALING												
3	DIAG NO.												
	SCALING												
4	DIAG NO.												
	SCALING												
5	DIAG NO.												
	SCALING												
6	DIAG NO.												
	SCALING												
7	DIAG NO.												
	SCALING												
8	DIAG NO.												
	SCALING												

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
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ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10 HcH By: pmp

T.S. No.: 4028 Date Implemented: By:

(NOT USED)

6. DETECTORS SUBMENU (Continued)

8. DETECTOR DIAGNOSTIC INTERVAL

DETECTOR DIAGNOSTIC INTERVAL			
DIAGNOSTIC NUMBER	NO ACTIVITY	MAX PRESENCE	ERRATIC COUNTS
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
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ASC/2

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Date Prepared: 8-11-10 HCH By: PMP

T.S. No.: 4028

Date Implemented: ______ By: ______

DETECTOR ASSIGNMENT WORK SHEET

LOOP LOCATION	LANE	DET ASSIGN	DET TYP #	PHASE 1	2	3	4	5	6	7	8	9	10	11	12	DET DELAY	DET EXTEND	QUEUE MAX	REMARKS
1-E-Ø1	LT	3	0	X															F
1-W-Ø5	LT	4	0					X											F
1-S-Ø3	LT	1	0			X													F
1-N-Ø7	LT	2	0							X									F
1-W-Ø2	1,2	7	5		X												2.0		Q
1-E-Ø6	1,2	8	5						X								2.0		Q
1-N-Ø4	1,2	5	5				X										2.0		Q
1-S-Ø8	1,2	6	5								X						2.0		Q
2-W-Ø2	1,2	11	0		X														A
2-N-Ø4	1,2	12	0				X												A
2-E-Ø6	1,2	9	0						X										A
2-S-Ø8	1,2	10	0								X								A

DETECTOR ASSIGNMENT DEFINITIONS

CONTROLLER	CONNECTOR'S A,B C								CONNECTOR D								CONNECTOR TELEMETRY								CONNECTOR TYPE 1							
	DETECTOR								DETECTOR								DETECTOR								INPUT TYPE 1 ONLY							
ASC-2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

* = DELAY Time or EXTEND Time set on External Sensor

** = When the Detector Input is set to be a TYPE 4 Detector, the EXTEND value set in the Controller becomes the QUEUE MAX value and any Extension Time needed must be set externally on the Sensor. If the Detector Input is set to be a TYPE 5, the EXTEND value becomes a Reset (Gap) Timer value and the Extension Time is set Externally on the Sensor Unit.

Q = QUEUE CLEARING LOOP F = FIRST VEHICLE LOOP
H = HOLDING LOOP A = ADVANCE LOOP

APPENDIX C:
EXISTING TRAFFIC COUNTS

Prepared by National Data & Surveying Services

Avalon Blvd & Carson St

Peak Hour Turning Movement Count

ID: 19-05496-009
City: Carson

Day: Wednesday
Date: 08/28/2019

PEAK HOURS		COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

Avalon Blvd – SOUTHBOUND

					Total	
AM	113	646	112	1	1000	AM
NOON	0	0	0	0	0	NOON
PM	180	890	205	4	995	PM
Lanes	0	3	1	0		

Carson St – EASTBOUND

AM	NOON	PM	Lanes
952	0	965	
1	0	1	0
136	0	179	2
686	0	818	2
71	0	104	0

Carson St – WESTBOUND

Lanes	PM	NOON	AM
0	103	0	108
2	685	0	760
2	331	0	313
0	11	0	5
	1517	0	1202

Avalon Blvd – NORTHBOUND

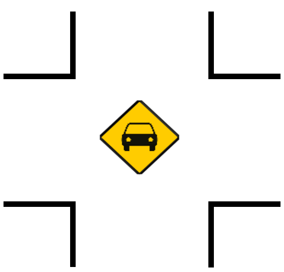
	Total					
Lanes		0	1	3	0	
PM	1326	1	99	709	483	PM
NOON	0	0	0	0	0	NOON
AM	1030	0	78	755	399	AM

CONTROL

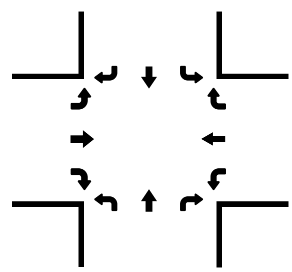
Signalized

	AM	NOON	PM
TEV	4184	0	4803
PHF	0.90		0.99

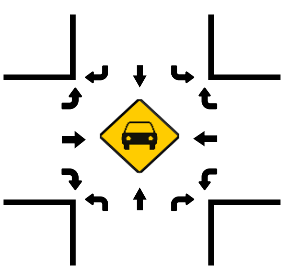
Total Vehicles (AM)



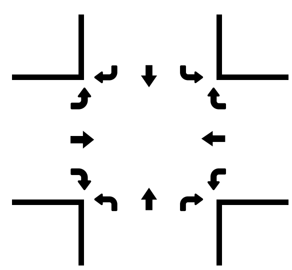
Total Vehicles (AM)



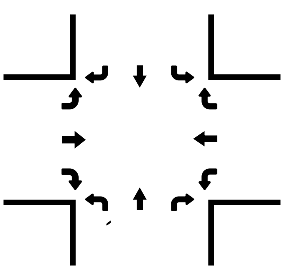
Total Vehicles (NOON)



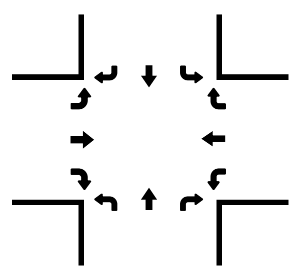
Total Vehicles (NOON)



Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg	0	0	0
North leg	0	0	0
West leg	0	0	0
West leg	0	0	0
East leg	0	0	0
East leg	0	0	0
South leg	0	0	0
South leg	0	0	0
NW corner	0	0	0
NE corner	0	0	0
SW corner	0	0	0
SE corner	0	0	0

Prepared by National Data & Surveying Services

I-405 SB Ramps & Carson St

Peak Hour Turning Movement Count

ID: 19-05496-011
City: Carson

Day: Tuesday
Date: 08/27/2019

	PEAK HOURS	COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

I-405 SB Ramps — SOUTHBOUND

	Right	Through	Left	U-Turn	Approach Total
AM	3	0	0	0	25
NOON	0	0	0	0	0
PM	4	0	0	0	32
Lanes	1	0	0	0	

Carson St — EASTBOUND

	AM	NOON	PM	Lanes
Departure Total	1255	0	1060	
U-Turn	0	0	3	0
Left	5	0	4	1
Through	674	0	1203	2
Right	572	0	907	1

Carson St — WESTBOUND

	PM	NOON	AM	Lanes
Right	18	0	13	0
Through	1037	0	1210	3
Left	69	0	70	1
U-Turn	0	0	0	0
Departure Total	1265	0	870	

CONTROL

Signalized

	AM	NOON	PM
TEV	2792	0	3333
PHF	0.92		0.95

I-405 SB Ramps — NORTHBOUND

	Departure Total	U-Turn	Left	Through	Right
Lanes		0	1	0	1
PM	976	0	16	10	62
NOON	0	0	0	0	0
AM	642	0	42	7	196

Total Vehicles (AM)

Total Vehicles (AM)

Total Vehicles (NOON)

Total Vehicles (NOON)

Total Vehicles (PM)

Total Vehicles (PM)

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North	0	0	0
South	0	0	0
East	0	0	0
West	0	0	0
NW diagonal	0	0	0
NE diagonal	0	0	0
SW diagonal	0	0	0
SE diagonal	0	0	0

Prepared by National Data & Surveying Services

I-405 NB Ramps & Carson St

Peak Hour Turning Movement Count

ID: 19-05496-012
City: Carson

Day: Tuesday
Date: 08/27/2019

PEAK HOURS		COUNT PERIODS
07:15 AM - 08:15 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:45 PM - 05:45 PM	PM	04:00 PM - 06:00 PM

I-405 NB Ramps — SOUTHBOUND

AM	465	16	15	1	388
NOON	0	0	0	0	0
PM	524	12	34	3	425
	1	0.5	0.5	0	

Carson St — EASTBOUND

AM	NOON	PM	
1302	0	1123	
0	0	0	0
104	0	140	1
732	0	1111	2
37	0	29	0

Carson St — WESTBOUND

	PM	NOON	AM
1	251	0	282
2	564	0	827
1	28	0	17
0	1	0	0
	1173	0	760

I-405 NB Ramps — NORTHBOUND

		0	0	0.5	0.5
PM	69	0	35	31	27
NOON	0	0	0	0	0
AM	70	0	10	1	13

CONTROL

Signalized

	AM	NOON	PM
TEV	2520	0	2790
PHF	0.91		0.94

Total Vehicles (AM)

Total Vehicles (AM)

Total Vehicles (NOON)

Total Vehicles (NOON)

Total Vehicles (PM)

Total Vehicles (PM)

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg (west side)	0	0	0
North leg (east side)	0	0	0
West leg (north side)	0	0	0
West leg (south side)	0	0	0
East leg (north side)	0	0	0
East leg (south side)	0	0	0
South leg (west side)	0	0	0
South leg (east side)	0	0	0
Northwest diagonal	0	0	0
Northeast diagonal	0	0	0
Southwest diagonal	0	0	0
Southeast diagonal	0	0	0

Prepared by National Data & Surveying Services

S Perry St & E Carson St

Peak Hour Turning Movement Count

ID: 21-020357-001
City: Carson

Day: Thursday
Date: 12/9/2021

PEAK HOURS		COUNT PERIODS
AM	07:30 AM - 08:30 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	4:00 PM - 06:00 PM

S Perry St

SOUTHBOUND

	Right	Thru	Left	U-Turn	Approach total
AM	80	0	9	0	78
NOON	0	0	0	0	0
PM	86	0	66	1	85
Lanes	0	1	0	0	

E Carson St

EASTBOUND

	AM	NOON	PM	Lanes
Approach total	771	0	817	
U-Turn	2	0	6	0
Left	52	0	62	1
Thru	636	0	858	2
Right	9	0	4	0

E Carson St

WESTBOUND

	PM	NOON	AM	Lanes
Right	22	0	26	0
Thru	720	0	685	2
Left	3	0	7	1
U-Turn	1	0	0	0
Approach total	936	0	649	

NORTHBOUND

S Perry St

	Approach total	U-Turn	Left	Thru	Right
Lanes		0	0	1	0
PM	7	0	5	0	11
NOON	0	0	0	0	0
AM	16	0	4	0	4

CONTROL

1-Way Stop(SB)

	AM	NOON	PM
TEV	1514	0	1845
PHF	0.87		0.96

Totals (AM)

Approach	Left	Thru	Right	U-Turn
Southbound	9	0	80	0
Eastbound	52	636	9	
Westbound	7	685	26	
Northbound	4	0	4	

Totals (NOON)

Approach	Left	Thru	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Totals (PM)

Approach	Left	Thru	Right
Southbound	66	0	86
Eastbound	62	858	4
Westbound	3	720	22
Northbound	5	0	11

Total Bikes (AM)

Approach	Left	Thru	Right
Southbound	0	0	0
Eastbound	0	2	0
Westbound	0	1	1
Northbound	0	0	0

Total Bikes (NOON)

Approach	Left	Thru	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Total Bikes (PM)

Approach	Left	Thru	Right
Southbound	0	0	0
Eastbound	1	1	0
Westbound	0	1	0
Northbound	0	0	0

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North	Eastbound	3	0	0
North	Westbound	4	0	1
West	Southbound	0	0	0
West	Northbound	0	0	0
East	Southbound	0	0	0
East	Northbound	1	0	0
South	Eastbound	1	0	1
South	Westbound	6	0	0
NW diagonal		0	0	0
NE diagonal		0	0	0
SW diagonal		0	0	0
SE diagonal		0	0	0

Prepared by National Data & Surveying Services

Wilmington Ave & Carson St

Peak Hour Turning Movement Count

ID: Historical
City: Carson

Day: Tuesday
Date: 06/04/2019

PEAK HOURS		COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Wilmington Ave – SOUTHBOUND

	U-turn	Left	Thru	Right	Total (exiting)
AM	109	372	138	2	885
NOON	0	0	0	0	0
PM	222	660	209	3	588
Lanes	0	2	1	0	

Carson St – EASTBOUND

	AM	NOON	PM	Lanes
Total (exiting)	595	0	662	
U-turn	1	0	3	0
Left	168	0	101	1
Thru	372	0	742	2
Right	42	0	61	0

Carson St – WESTBOUND

	PM	NOON	AM	Lanes
Left	114	0	254	0
Thru	354	0	427	2
Right	49	0	74	1
U-turn	0	0	1	0
Total (exiting)	1049	0	588	

Wilmington Ave – NORTHBOUND

	Total (exiting)	U-turn	Left	Thru	Right
Lanes		0	1	2	0
PM	776	6	83	370	98
NOON	0	0	0	0	0
AM	497	9	58	461	77

CONTROL

Signalized

	AM	NOON	PM
TEV	2565	0	3075
PHF	0.84		0.94

Cars (AM)

Southbound: 105, 293, 103
Westbound: 228, 421, 54
Eastbound: 157, 361, 37
Northbound: 53, 418, 62

MT (AM)

Southbound: 3, 44, 20
Westbound: 17, 6, 7
Eastbound: 8, 11, 3
Northbound: 4, 22, 6

Cars (NOON)

Southbound: N/A, N/A, N/A
Westbound: N/A, N/A, N/A
Eastbound: N/A, N/A, N/A
Northbound: N/A, N/A, N/A

MT (NOON)

Southbound: N/A, N/A, N/A
Westbound: N/A, N/A, N/A
Eastbound: N/A, N/A, N/A
Northbound: N/A, N/A, N/A

Cars (PM)

Southbound: 217, 602, 187
Westbound: 90, 345, 33
Eastbound: 88, 729, 58
Northbound: 80, 270, 81

MT (PM)

Southbound: 1, 26, 8
Westbound: 17, 4, 4
Eastbound: 8, 12, 3
Northbound: 2, 40, 10

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North (eastward / westward)	1 / 0	0 / 0	1 / 1
West (southward / northward)	1 / 2	0 / 0	2 / 0
East (southward / northward)	0 / 0	0 / 0	1 / 1
South (eastward / westward)	0 / 0	0 / 0	1 / 1
Diagonal NW	0	0	0
Diagonal NE	0	0	0
Diagonal SW	0	0	0
Diagonal SE	0	0	0

APPENDIX D:
LOS ANALYSIS SHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↱		↰	↑↑↱		↰	↑↑↱	
Traffic Volume (veh/h)	136	686	71	318	760	108	78	755	399	112	646	113
Future Volume (veh/h)	136	686	71	318	760	108	78	755	399	112	646	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	151	762	79	353	844	120	87	839	443	124	718	126
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	210	948	98	412	1093	155	110	1182	551	151	1621	282
Arrive On Green	0.06	0.29	0.29	0.12	0.35	0.35	0.06	0.35	0.35	0.08	0.37	0.37
Sat Flow, veh/h	3456	3250	337	3456	3123	444	1781	3404	1585	1781	4377	760
Grp Volume(v), veh/h	151	417	424	353	480	484	87	839	443	124	557	287
Grp Sat Flow(s),veh/h/ln	1728	1777	1810	1728	1777	1790	1781	1702	1585	1781	1702	1733
Q Serve(g_s), s	4.9	24.8	24.9	11.5	27.6	27.6	5.5	24.4	29.0	7.8	14.1	14.3
Cycle Q Clear(g_c), s	4.9	24.8	24.9	11.5	27.6	27.6	5.5	24.4	29.0	7.8	14.1	14.3
Prop In Lane	1.00		0.19	1.00		0.25	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	210	518	528	412	622	627	110	1182	551	151	1260	642
V/C Ratio(X)	0.72	0.80	0.80	0.86	0.77	0.77	0.79	0.71	0.80	0.82	0.44	0.45
Avail Cap(c_a), veh/h	498	690	703	498	690	696	257	1323	616	257	1323	674
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	37.5	37.5	49.5	33.2	33.2	53.0	32.4	33.9	51.6	27.2	27.2
Incr Delay (d2), s/veh	1.7	6.0	5.9	10.5	5.4	5.4	4.7	1.8	7.6	4.2	0.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	11.3	11.5	5.5	12.3	12.4	2.6	10.1	12.0	3.6	5.7	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	43.5	43.5	60.0	38.5	38.5	57.7	34.2	41.4	55.8	27.5	27.9
LnGrp LOS	D	D	D	E	D	D	E	C	D	E	C	C
Approach Vol, veh/h		992			1317			1369			968	
Approach Delay, s/veh		45.2			44.3			38.0			31.2	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	45.6	13.2	45.3	17.1	38.9	10.6	47.9
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	6.9	29.6	9.8	31.0	13.5	26.9	7.5	16.3
Green Ext Time (p_c), s	0.1	6.9	0.0	8.8	0.2	6.5	0.0	8.5

Intersection Summary	
HCM 6th Ctrl Delay	39.9
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	674	572	70	1210	0	42	0	196	0	0	0
Future Volume (veh/h)	5	674	572	70	1210	0	42	0	196	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	5	733	622	76	1315	0	46	0	213			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	315	1999	1141	198	3706	0	281	0	250			
Arrive On Green	0.56	0.56	0.56	0.22	1.00	0.00	0.16	0.00	0.16			
Sat Flow, veh/h	418	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	5	733	622	76	1315	0	46	0	213			
Grp Sat Flow(s),veh/h/ln	418	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.5	10.2	16.3	3.3	0.0	0.0	2.0	0.0	11.8			
Cycle Q Clear(g_c), s	0.5	10.2	16.3	3.3	0.0	0.0	2.0	0.0	11.8			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	315	1999	1141	198	3706	0	281	0	250			
V/C Ratio(X)	0.02	0.37	0.55	0.38	0.35	0.00	0.16	0.00	0.85			
Avail Cap(c_a), veh/h	315	1999	1141	303	3706	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.80	0.80	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.7	10.9	5.8	32.4	0.0	0.0	32.8	0.0	36.9			
Incr Delay (d2), s/veh	0.1	0.5	1.9	0.7	0.2	0.0	0.3	0.0	13.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	3.6	4.8	1.3	0.1	0.0	0.9	0.0	5.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.8	11.4	7.7	33.1	0.2	0.0	33.1	0.0	50.3			
LnGrp LOS	A	B	A	C	A	A	C	A	D			
Approach Vol, veh/h		1360			1391			259				
Approach Delay, s/veh		9.7			2.0			47.2				
Approach LOS		A			A			D				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.7	56.0				70.7		19.3				
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1				
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9				
Max Q Clear Time (g_c+I1), s	5.3	18.3				2.0		13.8				
Green Ext Time (p_c), s	0.1	10.8				19.2		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			9.4									
HCM 6th LOS			A									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	732	37	17	827	282	10	1	13	15	16	465
Future Volume (veh/h)	104	732	37	17	827	282	10	1	13	15	16	465
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	804	41	19	909	310	11	1	14	16	18	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	186	2832	1263	497	2275	1015	192	14	137	107	97	
Arrive On Green	0.21	1.00	1.00	0.64	0.64	0.64	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1781	3554	1585	652	3554	1585	1333	165	1585	558	1124	1585
Grp Volume(v), veh/h	114	804	41	19	909	310	12	0	14	34	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	652	1777	1585	1498	0	1585	1682	0	1585
Q Serve(g_s), s	5.2	0.0	0.0	1.0	11.1	7.9	0.0	0.0	0.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	0.0	1.0	11.1	7.9	0.5	0.0	0.7	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.92		1.00	0.47		1.00
Lane Grp Cap(c), veh/h	186	2832	1263	497	2275	1015	206	0	137	204	0	
V/C Ratio(X)	0.61	0.28	0.03	0.04	0.40	0.31	0.06	0.00	0.10	0.17	0.00	
Avail Cap(c_a), veh/h	501	2832	1263	497	2275	1015	398	0	350	422	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.9	0.0	0.0	6.0	7.8	7.2	37.8	0.0	37.9	38.3	0.0	0.0
Incr Delay (d2), s/veh	2.2	0.2	0.0	0.1	0.5	0.8	0.1	0.0	0.3	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.1	0.0	0.1	3.6	2.4	0.2	0.0	0.3	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	0.2	0.0	6.1	8.4	8.0	37.9	0.0	38.2	38.6	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		959			1238			26			34	A
Approach Delay, s/veh		4.5			8.2			38.1			38.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		77.1		12.9	14.1	63.0		12.9
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9
Max Q Clear Time (g_c+I1), s		2.0		3.5	7.2	13.1		2.7
Green Ext Time (p_c), s		9.8		0.1	0.2	9.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	78	123	0
Future Vol, veh/h	0	0	0	78	123	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	85	134	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	219	134	134	0	-	0
Stage 1	134	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	769	915	1451	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	769	915	1451	-	-	-
Mov Cap-2 Maneuver	769	-	-	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	938	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1451	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	52	636	9	7	979	26	6	0	4	9	0	114
Future Vol, veh/h	52	636	9	7	979	26	6	0	4	9	0	114
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	60	731	10	8	1125	30	7	0	5	10	0	131

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1155	0	0	741	0	0	1435	2027	371	1642	2017	578
Stage 1	-	-	-	-	-	-	856	856	-	1156	1156	-
Stage 2	-	-	-	-	-	-	579	1171	-	486	861	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	601	-	-	1173	-	-	159	67	*838	*101	67	459
Stage 1	-	-	-	-	-	-	583	552	-	*209	269	-
Stage 2	-	-	-	-	-	-	468	265	-	*790	549	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	601	-	-	1173	-	-	104	59	*838	*93	60	459
Mov Cap-2 Maneuver	-	-	-	-	-	-	104	59	-	*93	60	-
Stage 1	-	-	-	-	-	-	525	497	-	*188	267	-
Stage 2	-	-	-	-	-	-	332	263	-	*707	494	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.1	29.2	18.3
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	160	601	-	-	1173	-	-	93	459
HCM Lane V/C Ratio	0.072	0.099	-	-	0.007	-	-	0.111	0.285
HCM Control Delay (s)	29.2	11.7	-	-	8.1	-	-	48.5	15.9
HCM Lane LOS	D	B	-	-	A	-	-	E	C
HCM 95th %tile Q(veh)	0.2	0.3	-	-	0	-	-	0.4	1.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	372	42	74	427	254	67	461	77	140	372	109
Future Volume (veh/h)	168	372	42	74	427	254	67	461	77	140	372	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	200	443	50	88	508	302	80	549	92	167	443	130
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	237	1226	547	113	978	436	103	833	371	203	1033	461
Arrive On Green	0.14	0.35	0.35	0.06	0.28	0.28	0.06	0.24	0.24	0.12	0.30	0.30
Sat Flow, veh/h	1753	3497	1560	1753	3497	1560	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	200	443	50	88	508	302	80	549	92	167	443	130
Grp Sat Flow(s),veh/h/ln	1753	1749	1560	1753	1749	1560	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	9.1	7.7	1.8	4.1	10.1	14.2	3.7	11.6	3.9	7.6	8.4	5.3
Cycle Q Clear(g_c), s	9.1	7.7	1.8	4.1	10.1	14.2	3.7	11.6	3.9	7.6	8.4	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	1226	547	113	978	436	103	833	371	203	1033	461
V/C Ratio(X)	0.84	0.36	0.09	0.78	0.52	0.69	0.78	0.66	0.25	0.82	0.43	0.28
Avail Cap(c_a), veh/h	342	1895	845	342	1895	845	342	1895	845	342	1895	845
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	19.8	17.9	37.8	24.9	26.4	38.1	28.3	25.3	35.5	23.3	22.2
Incr Delay (d2), s/veh	8.7	0.3	0.1	4.4	0.6	2.8	4.7	1.3	0.5	3.2	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	3.0	0.6	1.8	4.0	5.2	1.7	4.7	1.4	3.3	3.3	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.3	20.1	18.0	42.2	25.5	29.2	42.9	29.5	25.8	38.7	23.7	22.7
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		693			898			721			740	
Approach Delay, s/veh		26.6			28.4			30.5			26.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.3	34.3	8.8	29.7	15.1	28.5	13.5	25.0
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	6.1	9.7	5.7	10.4	11.1	16.2	9.6	13.6
Green Ext Time (p_c), s	0.0	4.6	0.0	5.0	0.1	6.8	0.1	5.9

Intersection Summary			
HCM 6th Ctrl Delay			28.2
HCM 6th LOS			C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	151	841	353	964	87	1282	124	844
v/c Ratio	0.57	0.82	0.83	0.81	0.60	0.81	0.70	0.51
Control Delay	67.0	48.1	71.9	43.9	75.8	41.1	78.6	33.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.0	48.1	71.9	43.9	75.8	41.1	78.6	33.7
Queue Length 50th (ft)	65	349	154	387	73	335	104	197
Queue Length 95th (ft)	106	444	#250	511	134	431	179	268
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	466	1240	466	1287	240	1770	240	1827
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.68	0.76	0.75	0.36	0.72	0.52	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	5	733	622	76	1315	46	213
v/c Ratio	0.02	0.34	0.44	0.37	0.35	0.21	0.55
Control Delay	9.6	9.9	1.3	39.6	3.6	36.8	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	9.9	1.3	39.6	3.6	36.8	11.0
Queue Length 50th (ft)	1	99	1	43	66	24	0
Queue Length 95th (ft)	7	169	22	m79	76	53	59
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	228	2126	1478	300	3725	391	515
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.34	0.42	0.25	0.35	0.12	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	114	804	41	19	909	310	12	14	34	511
v/c Ratio	0.50	0.32	0.03	0.05	0.45	0.29	0.06	0.05	0.15	0.77
Control Delay	50.5	2.0	0.4	12.2	13.0	3.1	31.4	0.3	33.5	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	2.0	0.4	12.2	13.0	3.1	31.4	0.3	33.5	11.9
Queue Length 50th (ft)	53	10	0	4	134	5	6	0	18	0
Queue Length 95th (ft)	125	54	1	20	262	54	20	0	40	87
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2540	1186	384	2032	1056	328	417	361	748
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	0.32	0.03	0.05	0.45	0.29	0.04	0.03	0.09	0.68

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	200	443	50	88	508	302	80	549	92	167	443	130
v/c Ratio	0.67	0.38	0.09	0.53	0.62	0.50	0.51	0.66	0.21	0.66	0.40	0.22
Control Delay	51.9	27.4	2.5	55.5	36.2	6.9	55.4	37.4	8.0	54.0	28.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	27.4	2.5	55.5	36.2	6.9	55.4	37.4	8.0	54.0	28.3	6.2
Queue Length 50th (ft)	114	110	0	51	144	0	47	157	0	94	110	0
Queue Length 95th (ft)	#233	169	8	103	201	49	96	218	33	176	168	36
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	300	1670	789	300	1670	904	300	1670	794	300	1670	814
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.27	0.06	0.29	0.30	0.33	0.27	0.33	0.12	0.56	0.27	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	818	104	342	685	103	99	709	483	209	890	180
Future Volume (veh/h)	179	818	104	342	685	103	99	709	483	209	890	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	181	826	105	345	692	104	100	716	488	211	899	182
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	948	121	393	1070	161	123	1119	521	220	1634	329
Arrive On Green	0.07	0.30	0.30	0.11	0.35	0.35	0.07	0.33	0.33	0.12	0.38	0.38
Sat Flow, veh/h	3456	3171	403	3456	3098	465	1781	3404	1585	1781	4261	859
Grp Volume(v), veh/h	181	463	468	345	397	399	100	716	488	211	717	364
Grp Sat Flow(s),veh/h/ln	1728	1777	1798	1728	1777	1787	1781	1702	1585	1781	1702	1716
Q Serve(g_s), s	6.9	33.0	33.0	13.1	25.1	25.2	7.4	23.9	39.9	15.7	22.0	22.1
Cycle Q Clear(g_c), s	6.9	33.0	33.0	13.1	25.1	25.2	7.4	23.9	39.9	15.7	22.0	22.1
Prop In Lane	1.00		0.22	1.00		0.26	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	233	531	537	393	614	617	123	1119	521	220	1305	658
V/C Ratio(X)	0.78	0.87	0.87	0.88	0.65	0.65	0.81	0.64	0.94	0.96	0.55	0.55
Avail Cap(c_a), veh/h	427	592	599	427	614	617	220	1134	528	220	1305	658
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.3	44.4	44.4	58.2	36.8	36.8	61.3	38.1	43.5	58.2	32.2	32.2
Incr Delay (d2), s/veh	2.1	13.0	12.9	16.3	2.7	2.7	4.9	1.4	24.5	48.5	0.6	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	16.1	16.3	6.5	11.1	11.2	3.5	10.1	18.9	10.0	9.1	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.4	57.4	57.3	74.5	39.5	39.5	66.2	39.5	68.0	106.7	32.8	33.5
LnGrp LOS	E	E	E	E	D	D	E	D	E	F	C	C
Approach Vol, veh/h		1112			1141			1304			1292	
Approach Delay, s/veh		58.3			50.1			52.2			45.1	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	51.6	20.0	49.4	18.7	45.4	12.7	56.7
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	8.9	27.2	17.7	41.9	15.1	35.0	9.4	24.1
Green Ext Time (p_c), s	0.1	6.1	0.0	2.0	0.1	5.0	0.0	9.7

Intersection Summary			
HCM 6th Ctrl Delay			51.2
HCM 6th LOS			D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1203	907	69	1037	0	16	0	62	0	0	0
Future Volume (veh/h)	7	1203	907	69	1037	0	16	0	62	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	7	1266	955	73	1092	0	17	0	65			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	402	2215	1141	198	4016	0	172	0	153			
Arrive On Green	0.62	0.62	0.62	0.22	1.00	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	516	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	7	1266	955	73	1092	0	17	0	65			
Grp Sat Flow(s),veh/h/ln	516	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.5	18.8	38.2	3.1	0.0	0.0	0.8	0.0	3.5			
Cycle Q Clear(g_c), s	0.5	18.8	38.2	3.1	0.0	0.0	0.8	0.0	3.5			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	402	2215	1141	198	4016	0	172	0	153			
V/C Ratio(X)	0.02	0.57	0.84	0.37	0.27	0.00	0.10	0.00	0.42			
Avail Cap(c_a), veh/h	402	2215	1141	303	4016	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.82	0.82	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	6.5	9.9	8.9	32.3	0.0	0.0	37.1	0.0	38.3			
Incr Delay (d2), s/veh	0.1	1.1	7.4	0.7	0.1	0.0	0.2	0.0	1.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	6.3	12.2	1.3	0.1	0.0	0.3	0.0	1.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.6	11.0	16.2	33.0	0.1	0.0	37.3	0.0	40.1			
LnGrp LOS	A	B	B	C	A	A	D	A	D			
Approach Vol, veh/h		2228			1165			82				
Approach Delay, s/veh		13.2			2.2			39.5				
Approach LOS		B			A			D				

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.7	61.5				76.2		13.8
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9
Max Q Clear Time (g_c+I1), s	5.1	40.2				2.0		5.5
Green Ext Time (p_c), s	0.1	0.0				14.4		0.2

Intersection Summary			
HCM 6th Ctrl Delay			10.2
HCM 6th LOS			B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	1111	29	28	564	251	35	31	27	37	12	524
Future Volume (veh/h)	140	1111	29	28	564	251	35	31	27	37	12	524
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	149	1182	31	30	600	267	37	33	29	39	13	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	2753	1228	363	2182	973	141	107	172	149	40	
Arrive On Green	0.22	1.00	1.00	0.61	0.61	0.61	0.11	0.11	0.11	0.11	0.11	0.00
Sat Flow, veh/h	1781	3554	1585	460	3554	1585	736	990	1585	732	372	1585
Grp Volume(v), veh/h	149	1182	31	30	600	267	70	0	29	52	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	460	1777	1585	1726	0	1585	1104	0	1585
Q Serve(g_s), s	7.1	0.0	0.0	2.4	7.1	7.0	0.0	0.0	1.5	2.2	0.0	0.0
Cycle Q Clear(g_c), s	7.1	0.0	0.0	2.4	7.1	7.0	3.2	0.0	1.5	5.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.53		1.00	0.75		1.00
Lane Grp Cap(c), veh/h	193	2753	1228	363	2182	973	249	0	172	190	0	
V/C Ratio(X)	0.77	0.43	0.03	0.08	0.27	0.27	0.28	0.00	0.17	0.27	0.00	
Avail Cap(c_a), veh/h	501	2753	1228	363	2182	973	427	0	350	352	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.2	0.0	0.0	7.2	8.1	8.1	37.2	0.0	36.4	38.6	0.0	0.0
Incr Delay (d2), s/veh	3.8	0.4	0.0	0.4	0.3	0.7	0.6	0.0	0.5	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.1	0.0	0.2	2.4	2.2	1.5	0.0	0.6	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	0.4	0.0	7.6	8.4	8.8	37.8	0.0	36.9	39.4	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1362			897			99			52	A
Approach Delay, s/veh		4.5			8.5			37.5			39.4	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		75.1		14.9	14.5	60.7		14.9
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9
Max Q Clear Time (g_c+I1), s		2.0		7.4	9.1	9.1		5.2
Green Ext Time (p_c), s		17.4		0.1	0.2	7.2		0.3

Intersection Summary	
HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	102	152	0
Future Vol, veh/h	0	0	0	102	152	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	111	165	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	276	165	165	0	-	0
Stage 1	165	-	-	-	-	-
Stage 2	111	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	714	879	1413	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	714	879	1413	-	-	-
Mov Cap-2 Maneuver	714	-	-	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	914	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1413	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	1073	5	3	720	22	5	0	11	66	0	86
Future Vol, veh/h	85	1073	5	3	720	22	5	0	11	66	0	86
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	89	1118	5	3	750	23	5	0	11	69	0	90

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	773	0	0	1123	0	0	1680	2078	562	1505	2069	387
Stage 1	-	-	-	-	-	-	1299	1299	-	768	768	-
Stage 2	-	-	-	-	-	-	381	779	-	737	1301	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	838	-	-	*999	-	-	154	74	*668	*247	76	611
Stage 1	-	-	-	-	-	-	457	435	-	*360	409	-
Stage 2	-	-	-	-	-	-	613	404	-	*629	433	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	838	-	-	*999	-	-	121	66	*668	*223	68	611
Mov Cap-2 Maneuver	-	-	-	-	-	-	121	66	-	*223	68	-
Stage 1	-	-	-	-	-	-	409	388	-	*322	408	-
Stage 2	-	-	-	-	-	-	522	403	-	*553	387	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	18.8	19
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	277	838	-	-	* 999	-	-	223	611
HCM Lane V/C Ratio	0.06	0.106	-	-	0.003	-	-	0.308	0.147
HCM Control Delay (s)	18.8	9.8	-	-	8.6	-	-	28.2	11.9
HCM Lane LOS	C	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.2	0.4	-	-	0	-	-	1.3	0.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	742	61	49	354	114	89	370	98	212	660	222
Future Volume (veh/h)	104	742	61	49	354	114	89	370	98	212	660	222
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	111	789	65	52	377	121	95	394	104	226	702	236
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	141	1151	513	65	1000	446	121	799	357	265	1087	485
Arrive On Green	0.08	0.33	0.33	0.04	0.29	0.29	0.07	0.23	0.23	0.15	0.31	0.31
Sat Flow, veh/h	1739	3469	1547	1739	3469	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	111	789	65	52	377	121	95	394	104	226	702	236
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1739	1735	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	4.8	15.1	2.2	2.3	6.7	4.6	4.1	7.6	4.3	9.7	13.4	9.5
Cycle Q Clear(g_c), s	4.8	15.1	2.2	2.3	6.7	4.6	4.1	7.6	4.3	9.7	13.4	9.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	141	1151	513	65	1000	446	121	799	357	265	1087	485
V/C Ratio(X)	0.79	0.69	0.13	0.80	0.38	0.27	0.78	0.49	0.29	0.85	0.65	0.49
Avail Cap(c_a), veh/h	363	2013	898	363	2013	898	363	2013	898	363	2013	898
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	22.2	17.9	36.6	21.8	21.1	35.1	25.6	24.3	31.7	22.7	21.3
Incr Delay (d2), s/veh	3.7	1.0	0.2	8.0	0.3	0.5	4.1	0.7	0.6	10.4	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.7	0.8	1.1	2.5	1.6	1.8	3.0	1.5	4.6	5.1	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	23.2	18.0	44.6	22.1	21.5	39.2	26.3	25.0	42.0	23.6	22.4
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		965			550			593			1164	
Approach Delay, s/veh		24.6			24.1			28.1			26.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	30.9	9.3	29.5	10.2	27.6	15.7	23.2
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	4.3	17.1	6.1	15.4	6.8	8.7	11.7	9.6
Green Ext Time (p_c), s	0.0	8.4	0.0	8.7	0.0	4.3	0.1	4.4

Intersection Summary		
HCM 6th Ctrl Delay		26.0
HCM 6th LOS		C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	181	931	345	796	100	1204	211	1081
v/c Ratio	0.64	0.88	0.86	0.68	0.66	0.88dr	0.94	0.64
Control Delay	70.0	53.6	78.2	40.3	79.9	42.4	105.1	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.0	53.6	78.2	40.3	79.9	42.4	105.1	38.2
Queue Length 50th (ft)	82	411	159	311	89	328	~194	291
Queue Length 95th (ft)	122	506	#241	406	148	387	#368	362
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	435	1155	435	1215	224	1662	224	1707
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.81	0.79	0.66	0.45	0.72	0.94	0.63

Intersection Summary

~ 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.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	7	1266	955	73	1092	17	65
v/c Ratio	0.02	0.61	0.68	0.36	0.30	0.07	0.22
Control Delay	10.7	14.2	4.1	47.6	3.3	32.2	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	14.2	4.1	47.6	3.3	32.2	6.2
Queue Length 50th (ft)	1	215	40	43	32	9	0
Queue Length 95th (ft)	10	388	114	m75	93	25	22
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	283	2091	1470	300	3669	391	417
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.61	0.65	0.24	0.30	0.04	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	149	1182	31	30	600	267	70	29	52	557
v/c Ratio	0.59	0.47	0.03	0.12	0.32	0.27	0.32	0.10	0.26	0.79
Control Delay	54.5	3.5	1.1	15.1	13.3	2.9	37.0	0.6	35.8	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	3.5	1.1	15.1	13.3	2.9	37.0	0.6	35.8	12.2
Queue Length 50th (ft)	92	63	0	7	84	0	38	0	28	1
Queue Length 95th (ft)	m154	74	m1	31	171	45	68	0	55	94
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2535	1181	241	1859	982	339	420	308	784
Starvation Cap Reductn	0	147	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	0.30	0.49	0.03	0.12	0.32	0.27	0.21	0.07	0.17	0.71

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	111	789	65	52	377	121	95	394	104	226	702	236
v/c Ratio	0.59	0.71	0.12	0.40	0.41	0.24	0.55	0.47	0.23	0.76	0.59	0.37
Control Delay	60.7	34.8	4.6	60.0	32.3	7.4	60.1	33.9	7.6	61.2	32.4	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.7	34.8	4.6	60.0	32.3	7.4	60.1	33.9	7.6	61.2	32.4	13.2
Queue Length 50th (ft)	66	223	0	31	97	0	56	108	0	135	196	37
Queue Length 95th (ft)	158	388	23	88	183	47	138	185	42	#393	343	124
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	299	1662	786	299	1662	806	299	1662	797	299	1662	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.47	0.08	0.17	0.23	0.15	0.32	0.24	0.13	0.76	0.42	0.29

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	705	72	327	780	112	80	770	409	117	659	115
Future Volume (veh/h)	139	705	72	327	780	112	80	770	409	117	659	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	783	80	363	867	124	89	856	454	130	732	128
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	211	958	98	419	1105	158	112	1175	547	156	1621	281
Arrive On Green	0.06	0.29	0.29	0.12	0.35	0.35	0.06	0.35	0.35	0.09	0.37	0.37
Sat Flow, veh/h	3456	3255	332	3456	3121	446	1781	3404	1585	1781	4379	758
Grp Volume(v), veh/h	154	427	436	363	494	497	89	856	454	130	567	293
Grp Sat Flow(s),veh/h/ln	1728	1777	1811	1728	1777	1790	1781	1702	1585	1781	1702	1734
Q Serve(g_s), s	5.2	26.5	26.6	12.2	29.5	29.5	5.9	26.1	31.2	8.5	15.0	15.2
Cycle Q Clear(g_c), s	5.2	26.5	26.6	12.2	29.5	29.5	5.9	26.1	31.2	8.5	15.0	15.2
Prop In Lane	1.00		0.18	1.00		0.25	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	211	523	533	419	629	634	112	1175	547	156	1260	642
V/C Ratio(X)	0.73	0.82	0.82	0.87	0.78	0.78	0.79	0.73	0.83	0.83	0.45	0.46
Avail Cap(c_a), veh/h	480	666	679	480	666	671	248	1276	594	248	1276	650
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.8	38.9	38.9	51.2	34.3	34.3	54.9	34.0	35.7	53.3	28.3	28.3
Incr Delay (d2), s/veh	1.8	7.1	7.0	12.8	6.3	6.2	4.7	2.2	9.6	6.6	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	12.2	12.5	5.9	13.4	13.4	2.8	10.9	13.2	4.1	6.1	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.6	46.1	46.0	64.0	40.6	40.5	59.6	36.2	45.3	59.9	28.6	29.1
LnGrp LOS	E	D	D	E	D	D	E	D	D	E	C	C
Approach Vol, veh/h		1017			1354			1399			990	
Approach Delay, s/veh		47.6			46.8			40.6			32.9	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	47.6	13.9	46.5	17.9	40.4	11.0	49.4
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	7.2	31.5	10.5	33.2	14.2	28.6	7.9	17.2
Green Ext Time (p_c), s	0.1	6.5	0.0	7.8	0.1	6.4	0.0	8.6

Intersection Summary	
HCM 6th Ctrl Delay	42.3
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	700	583	78	1245	0	43	0	212	0	0	0
Future Volume (veh/h)	5	700	583	78	1245	0	43	0	212	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	5	761	634	85	1353	0	47	0	230			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	302	1962	1141	198	3653	0	299	0	266			
Arrive On Green	0.55	0.55	0.55	0.22	1.00	0.00	0.17	0.00	0.17			
Sat Flow, veh/h	403	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	5	761	634	85	1353	0	47	0	230			
Grp Sat Flow(s),veh/h/ln	403	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.5	11.0	16.8	3.7	0.0	0.0	2.0	0.0	12.7			
Cycle Q Clear(g_c), s	0.5	11.0	16.8	3.7	0.0	0.0	2.0	0.0	12.7			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	302	1962	1141	198	3653	0	299	0	266			
V/C Ratio(X)	0.02	0.39	0.56	0.43	0.37	0.00	0.16	0.00	0.86			
Avail Cap(c_a), veh/h	302	1962	1141	303	3653	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	9.1	11.5	5.9	32.5	0.0	0.0	32.0	0.0	36.4			
Incr Delay (d2), s/veh	0.1	0.6	2.0	0.9	0.2	0.0	0.2	0.0	15.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	4.0	5.0	1.5	0.1	0.0	0.9	0.0	6.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.2	12.1	7.8	33.4	0.2	0.0	32.2	0.0	52.2			
LnGrp LOS	A	B	A	C	A	A	C	A	D			
Approach Vol, veh/h		1400			1438			277				
Approach Delay, s/veh		10.1			2.2			48.8				
Approach LOS		B			A			D				

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.7	55.1				69.8		20.2
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9
Max Q Clear Time (g_c+I1), s	5.7	18.8				2.0		14.7
Green Ext Time (p_c), s	0.1	11.0				20.1		0.4

Intersection Summary	
HCM 6th Ctrl Delay	9.9
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	771	38	17	861	299	10	1	13	23	16	474
Future Volume (veh/h)	106	771	38	17	861	299	10	1	13	23	16	474
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	116	847	42	19	946	329	11	1	14	25	18	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	187	2815	1255	477	2256	1006	200	15	145	132	79	
Arrive On Green	0.21	1.00	1.00	0.63	0.63	0.63	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1781	3554	1585	625	3554	1585	1352	164	1585	754	862	1585
Grp Volume(v), veh/h	116	847	42	19	946	329	12	0	14	43	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	625	1777	1585	1516	0	1585	1616	0	1585
Q Serve(g_s), s	5.3	0.0	0.0	1.0	11.9	8.6	0.0	0.0	0.7	0.6	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	0.0	1.0	11.9	8.6	0.5	0.0	0.7	2.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.92		1.00	0.58		1.00
Lane Grp Cap(c), veh/h	187	2815	1255	477	2256	1006	215	0	145	211	0	
V/C Ratio(X)	0.62	0.30	0.03	0.04	0.42	0.33	0.06	0.00	0.10	0.20	0.00	
Avail Cap(c_a), veh/h	501	2815	1255	477	2256	1006	400	0	350	414	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.9	0.0	0.0	6.2	8.2	7.6	37.4	0.0	37.5	38.0	0.0	0.0
Incr Delay (d2), s/veh	2.3	0.3	0.0	0.2	0.6	0.9	0.1	0.0	0.3	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.1	0.0	0.1	3.9	2.6	0.2	0.0	0.3	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	0.3	0.0	6.3	8.8	8.4	37.5	0.0	37.8	38.5	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1005			1294			26			43	A
Approach Delay, s/veh		4.4			8.6			37.7			38.5	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		76.7		13.3	14.1	62.5		13.3				
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1				
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9				
Max Q Clear Time (g_c+I1), s		2.0		4.0	7.3	13.9		2.7				
Green Ext Time (p_c), s		10.6		0.1	0.2	9.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			7.7
HCM 6th LOS			A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↰	↱	
Traffic Vol, veh/h	7	37	42	80	126	7
Future Vol, veh/h	7	37	42	80	126	7
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	40	46	87	137	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	320	141	145	0	-	0
Stage 1	141	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	673	907	1437	-	-	-
Stage 1	886	-	-	-	-	-
Stage 2	852	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	650	907	1437	-	-	-
Mov Cap-2 Maneuver	650	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1437	-	853	-	-
HCM Lane V/C Ratio	0.032	-	0.056	-	-
HCM Control Delay (s)	7.6	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	649	9	7	998	36	6	0	4	18	0	145
Future Vol, veh/h	85	649	9	7	998	36	6	0	4	18	0	145
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	98	746	10	8	1147	41	7	0	5	21	0	167

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1188	0	0	756	0	0	1537	2151	378	1753	2136	594
Stage 1	-	-	-	-	-	-	947	947	-	1184	1184	-
Stage 2	-	-	-	-	-	-	590	1204	-	569	952	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	583	-	-	1155	-	-	127	53	*838	*79	54	448
Stage 1	-	-	-	-	-	-	498	490	-	*201	261	-
Stage 2	-	-	-	-	-	-	461	255	-	*790	487	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	583	-	-	1155	-	-	69	43	*838	*68	45	448
Mov Cap-2 Maneuver	-	-	-	-	-	-	69	43	-	*68	45	-
Stage 1	-	-	-	-	-	-	414	408	-	*167	259	-
Stage 2	-	-	-	-	-	-	287	253	-	*653	405	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.1	41.9	24.5
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	109	583	-	-	1155	-	-	68	448
HCM Lane V/C Ratio	0.105	0.168	-	-	0.007	-	-	0.304	0.372
HCM Control Delay (s)	41.9	12.4	-	-	8.1	-	-	79.6	17.7
HCM Lane LOS	E	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.3	0.6	-	-	0	-	-	1.1	1.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	382	45	75	438	259	71	470	79	143	379	116
Future Volume (veh/h)	176	382	45	75	438	259	71	470	79	143	379	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	210	455	54	89	521	308	85	560	94	170	451	138
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	246	1247	556	114	983	438	109	836	373	205	1028	458
Arrive On Green	0.14	0.36	0.36	0.06	0.28	0.28	0.06	0.24	0.24	0.12	0.29	0.29
Sat Flow, veh/h	1753	3497	1560	1753	3497	1560	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	210	455	54	89	521	308	85	560	94	170	451	138
Grp Sat Flow(s),veh/h/ln	1753	1749	1560	1753	1749	1560	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	10.0	8.2	2.0	4.3	10.7	15.1	4.1	12.4	4.2	8.1	8.9	5.8
Cycle Q Clear(g_c), s	10.0	8.2	2.0	4.3	10.7	15.1	4.1	12.4	4.2	8.1	8.9	5.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	246	1247	556	114	983	438	109	836	373	205	1028	458
V/C Ratio(X)	0.85	0.36	0.10	0.78	0.53	0.70	0.78	0.67	0.25	0.83	0.44	0.30
Avail Cap(c_a), veh/h	329	1824	814	329	1824	814	329	1824	814	329	1824	814
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	20.3	18.3	39.3	25.9	27.5	39.4	29.4	26.3	36.8	24.4	23.3
Incr Delay (d2), s/veh	12.1	0.3	0.1	4.3	0.6	2.9	4.5	1.3	0.5	4.5	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	3.2	0.7	1.9	4.3	5.6	1.8	5.1	1.5	3.6	3.5	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	20.6	18.4	43.6	26.5	30.4	43.9	30.7	26.8	41.3	24.8	23.9
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		719			918			739			759	
Approach Delay, s/veh		28.4			29.5			31.8			28.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	35.9	9.3	30.6	16.0	29.5	14.0	25.9
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	6.3	10.2	6.1	10.9	12.0	17.1	10.1	14.4
Green Ext Time (p_c), s	0.0	4.7	0.0	5.2	0.1	6.9	0.1	6.0

Intersection Summary	
HCM 6th Ctrl Delay	29.5
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	154	863	363	991	89	1310	130	860
v/c Ratio	0.58	0.84	0.85	0.83	0.61	0.83	0.73	0.52
Control Delay	67.9	49.6	74.4	45.4	76.7	42.7	80.6	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	49.6	74.4	45.4	76.7	42.7	80.6	34.3
Queue Length 50th (ft)	68	364	161	406	76	353	111	206
Queue Length 95th (ft)	107	458	#260	531	136	444	187	275
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	456	1216	456	1265	235	1737	235	1794
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.71	0.80	0.78	0.38	0.75	0.55	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	5	761	634	85	1353	47	230
v/c Ratio	0.02	0.36	0.45	0.40	0.36	0.21	0.57
Control Delay	10.0	10.3	1.6	40.1	3.6	36.7	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	10.3	1.6	40.1	3.6	36.7	11.0
Queue Length 50th (ft)	1	104	6	47	68	25	0
Queue Length 95th (ft)	7	182	32	m86	79	53	61
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	217	2114	1470	300	3721	391	529
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.36	0.43	0.28	0.36	0.12	0.43

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	116	847	42	19	946	329	12	14	43	521
v/c Ratio	0.51	0.33	0.04	0.05	0.47	0.31	0.06	0.05	0.19	0.78
Control Delay	49.3	2.0	0.4	12.4	13.4	3.4	31.3	0.3	34.4	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.3	2.0	0.4	12.4	13.4	3.4	31.3	0.3	34.4	12.5
Queue Length 50th (ft)	50	11	0	4	143	8	6	0	23	3
Queue Length 95th (ft)	126	57	m1	20	276	61	20	0	48	93
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2535	1184	368	2024	1055	327	417	345	751
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	0.33	0.04	0.05	0.47	0.31	0.04	0.03	0.12	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	455	54	89	521	308	85	560	94	170	451	138
v/c Ratio	0.71	0.39	0.09	0.54	0.62	0.51	0.53	0.67	0.21	0.67	0.41	0.23
Control Delay	55.4	27.9	3.0	56.3	36.7	6.9	56.4	37.8	7.9	55.1	28.8	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	27.9	3.0	56.3	36.7	6.9	56.4	37.8	7.9	55.1	28.8	6.1
Queue Length 50th (ft)	122	115	0	53	151	0	50	163	0	97	114	0
Queue Length 95th (ft)	#253	176	10	105	208	49	102	224	34	180	174	37
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	294	1638	776	294	1638	895	294	1638	782	294	1638	805
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.28	0.07	0.30	0.32	0.34	0.29	0.34	0.12	0.58	0.28	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	837	106	350	701	106	101	723	494	214	908	184
Future Volume (veh/h)	183	837	106	350	701	106	101	723	494	214	908	184
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	185	845	107	354	708	107	102	730	499	216	917	186
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	236	957	121	401	1081	163	125	1115	519	217	1616	327
Arrive On Green	0.07	0.30	0.30	0.12	0.35	0.35	0.07	0.33	0.33	0.12	0.38	0.38
Sat Flow, veh/h	3456	3173	402	3456	3096	468	1781	3404	1585	1781	4259	860
Grp Volume(v), veh/h	185	473	479	354	406	409	102	730	499	216	732	371
Grp Sat Flow(s),veh/h/ln	1728	1777	1798	1728	1777	1786	1781	1702	1585	1781	1702	1715
Q Serve(g_s), s	7.1	34.3	34.3	13.7	26.1	26.2	7.7	24.9	41.8	16.4	23.0	23.2
Cycle Q Clear(g_c), s	7.1	34.3	34.3	13.7	26.1	26.2	7.7	24.9	41.8	16.4	23.0	23.2
Prop In Lane	1.00		0.22	1.00		0.26	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	236	536	542	401	621	624	125	1115	519	217	1292	651
V/C Ratio(X)	0.78	0.88	0.88	0.88	0.65	0.66	0.82	0.65	0.96	1.00	0.57	0.57
Avail Cap(c_a), veh/h	421	584	591	421	621	624	217	1118	521	217	1292	651
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.1	45.0	45.0	59.0	37.2	37.2	62.1	39.0	44.7	59.4	33.2	33.3
Incr Delay (d2), s/veh	2.2	14.6	14.5	17.9	2.8	2.8	4.9	1.6	29.8	59.6	0.7	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	17.0	17.1	6.9	11.6	11.7	3.6	10.6	20.5	11.0	9.6	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.3	59.7	59.5	76.8	40.0	40.0	67.0	40.5	74.4	119.1	33.9	34.7
LnGrp LOS	E	E	E	E	D	D	E	D	E	F	C	C
Approach Vol, veh/h		1137			1169			1331			1319	
Approach Delay, s/veh		60.4			51.1			55.3			48.1	
Approach LOS		E			D			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.7	52.8	20.0	49.9	19.2	46.3	13.0	56.9				
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5				
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5				
Max Q Clear Time (g_c+I1), s	9.1	28.2	18.4	43.8	15.7	36.3	9.7	25.2				
Green Ext Time (p_c), s	0.1	6.1	0.0	0.5	0.1	4.5	0.0	9.6				
Intersection Summary												
HCM 6th Ctrl Delay			53.6									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1233	925	74	1063	0	16	0	69	0	0	0
Future Volume (veh/h)	7	1233	925	74	1063	0	16	0	69	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	7	1298	974	78	1119	0	17	0	73			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	392	2205	1141	198	4003	0	177	0	158			
Arrive On Green	0.62	0.62	0.62	0.22	1.00	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	503	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	7	1298	974	78	1119	0	17	0	73			
Grp Sat Flow(s),veh/h/ln	503	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.5	19.6	40.2	3.4	0.0	0.0	0.8	0.0	3.9			
Cycle Q Clear(g_c), s	0.5	19.6	40.2	3.4	0.0	0.0	0.8	0.0	3.9			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	392	2205	1141	198	4003	0	177	0	158			
V/C Ratio(X)	0.02	0.59	0.85	0.39	0.28	0.00	0.10	0.00	0.46			
Avail Cap(c_a), veh/h	392	2205	1141	303	4003	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.80	0.80	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	6.6	10.2	9.2	32.4	0.0	0.0	36.9	0.0	38.3			
Incr Delay (d2), s/veh	0.1	1.2	8.2	0.8	0.1	0.0	0.2	0.0	2.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	6.6	13.0	1.4	0.1	0.0	0.3	0.0	1.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.7	11.4	17.3	33.2	0.1	0.0	37.1	0.0	40.4			
LnGrp LOS	A	B	B	C	A	A	D	A	D			
Approach Vol, veh/h		2279			1197			90				
Approach Delay, s/veh		13.9			2.3			39.8				
Approach LOS		B			A			D				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.7	61.3				76.0		14.0				
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1				
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9				
Max Q Clear Time (g_c+I1), s	5.4	42.2				2.0		5.9				
Green Ext Time (p_c), s	0.1	0.0				14.9		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			10.7									
HCM 6th LOS			B									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	143	1144	30	29	584	262	36	32	28	41	12	534
Future Volume (veh/h)	143	1144	30	29	584	262	36	32	28	41	12	534
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	1217	32	31	621	279	38	34	30	44	13	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	2752	1227	353	2180	972	142	108	173	151	36	
Arrive On Green	0.22	1.00	1.00	0.61	0.61	0.61	0.11	0.11	0.11	0.11	0.11	0.00
Sat Flow, veh/h	1781	3554	1585	445	3554	1585	739	994	1585	737	330	1585
Grp Volume(v), veh/h	152	1217	32	31	621	279	72	0	30	57	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	445	1777	1585	1734	0	1585	1068	0	1585
Q Serve(g_s), s	7.2	0.0	0.0	2.6	7.4	7.4	0.0	0.0	1.5	2.7	0.0	0.0
Cycle Q Clear(g_c), s	7.2	0.0	0.0	2.6	7.4	7.4	3.3	0.0	1.5	5.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.53		1.00	0.77		1.00
Lane Grp Cap(c), veh/h	193	2752	1227	353	2180	972	250	0	173	187	0	
V/C Ratio(X)	0.79	0.44	0.03	0.09	0.28	0.29	0.29	0.00	0.17	0.30	0.00	
Avail Cap(c_a), veh/h	501	2752	1227	353	2180	972	428	0	350	348	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.2	0.0	0.0	7.2	8.1	8.2	37.2	0.0	36.4	39.0	0.0	0.0
Incr Delay (d2), s/veh	4.0	0.4	0.0	0.5	0.3	0.7	0.6	0.0	0.5	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.2	0.0	0.3	2.5	2.3	1.5	0.0	0.6	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.2	0.4	0.0	7.7	8.5	8.9	37.8	0.0	36.9	39.9	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1401			931			102			57	A
Approach Delay, s/veh		4.5			8.6			37.5			39.9	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		75.1		14.9	14.5	60.6		14.9				
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1				
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9				
Max Q Clear Time (g_c+I1), s		2.0		7.9	9.2	9.4		5.3				
Green Ext Time (p_c), s		18.3		0.1	0.2	7.5		0.3				

Intersection Summary			
HCM 6th Ctrl Delay			8.2
HCM 6th LOS			A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	1.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	20	19	104	155	3
Future Vol, veh/h	3	20	19	104	155	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	22	21	113	168	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	325	170	171	0	-	0
Stage 1	170	-	-	-	-	-
Stage 2	155	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	669	874	1406	-	-	-
Stage 1	860	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	658	874	1406	-	-	-
Mov Cap-2 Maneuver	658	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	873	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1406	-	838	-	-
HCM Lane V/C Ratio	0.015	-	0.03	-	-
HCM Control Delay (s)	7.6	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	101	1094	5	3	734	27	5	0	11	72	0	103
Future Vol, veh/h	101	1094	5	3	734	27	5	0	11	72	0	103
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	105	1140	5	3	765	28	5	0	11	75	0	107

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	793	0	0	1145	0	0	1742	2152	573	1565	2140	397
Stage 1	-	-	-	-	-	-	1353	1353	-	785	785	-
Stage 2	-	-	-	-	-	-	389	799	-	780	1355	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	824	-	-	*948	-	-	149	66	*634	*246	68	602
Stage 1	-	-	-	-	-	-	467	436	-	*352	402	-
Stage 2	-	-	-	-	-	-	606	396	-	*597	435	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	824	-	-	*948	-	-	110	58	*634	*217	59	602
Mov Cap-2 Maneuver	-	-	-	-	-	-	110	58	-	*217	59	-
Stage 1	-	-	-	-	-	-	408	381	-	*307	401	-
Stage 2	-	-	-	-	-	-	496	395	-	*512	379	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	20.1	19.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	255	824	-	-	* 948	-	-	217	602
HCM Lane V/C Ratio	0.065	0.128	-	-	0.003	-	-	0.346	0.178
HCM Control Delay (s)	20.1	10	-	-	8.8	-	-	30.1	12.3
HCM Lane LOS	C	B	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.2	0.4	-	-	0	-	-	1.5	0.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	758	63	50	362	116	92	377	100	216	673	229
Future Volume (veh/h)	108	758	63	50	362	116	92	377	100	216	673	229
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	115	806	67	53	385	123	98	401	106	230	716	244
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	145	1160	517	67	1003	447	125	807	360	268	1093	488
Arrive On Green	0.08	0.33	0.33	0.04	0.29	0.29	0.07	0.23	0.23	0.15	0.32	0.32
Sat Flow, veh/h	1739	3469	1547	1739	3469	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	115	806	67	53	385	123	98	401	106	230	716	244
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1739	1735	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	5.1	15.9	2.4	2.4	7.0	4.9	4.4	7.9	4.5	10.2	14.1	10.1
Cycle Q Clear(g_c), s	5.1	15.9	2.4	2.4	7.0	4.9	4.4	7.9	4.5	10.2	14.1	10.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	1160	517	67	1003	447	125	807	360	268	1093	488
V/C Ratio(X)	0.79	0.70	0.13	0.79	0.38	0.28	0.78	0.50	0.29	0.86	0.65	0.50
Avail Cap(c_a), veh/h	352	1954	872	352	1954	872	352	1954	872	352	1954	872
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	22.8	18.3	37.7	22.5	21.7	36.1	26.3	25.0	32.6	23.3	22.0
Incr Delay (d2), s/veh	3.6	1.1	0.2	7.7	0.3	0.5	4.0	0.7	0.6	12.3	1.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.1	0.8	1.1	2.7	1.7	1.9	3.1	1.6	4.9	5.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	23.9	18.5	45.4	22.8	22.2	40.1	27.0	25.6	44.8	24.3	23.1
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		988			561			605			1190	
Approach Delay, s/veh		25.3			24.8			28.9			28.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	31.9	9.7	30.4	10.6	28.3	16.2	23.9
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	4.4	17.9	6.4	16.1	7.1	9.0	12.2	9.9
Green Ext Time (p_c), s	0.0	8.5	0.0	8.8	0.0	4.4	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	26.8
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	185	952	354	815	102	1229	216	1103
v/c Ratio	0.64	0.90	0.87	0.69	0.67	0.89dr	0.98	0.66
Control Delay	70.7	55.6	80.2	41.1	80.9	43.3	114.4	38.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.7	55.6	80.2	41.1	80.9	43.3	114.4	38.9
Queue Length 50th (ft)	85	428	165	325	92	338	~210	299
Queue Length 95th (ft)	123	#530	#251	418	150	398	#379	371
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	428	1139	428	1207	220	1641	220	1696
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.84	0.83	0.68	0.46	0.75	0.98	0.65

Intersection Summary

~ 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.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	7	1298	974	78	1119	17	73
v/c Ratio	0.03	0.62	0.69	0.38	0.31	0.07	0.25
Control Delay	11.0	14.8	4.6	47.6	3.4	31.9	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	14.8	4.6	47.6	3.4	31.9	7.8
Queue Length 50th (ft)	1	227	46	46	34	9	0
Queue Length 95th (ft)	10	408	148	m78	98	25	28
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	274	2078	1463	300	3658	391	417
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.62	0.67	0.26	0.31	0.04	0.18

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	152	1217	32	31	621	279	72	30	57	568
v/c Ratio	0.59	0.48	0.03	0.13	0.34	0.28	0.33	0.10	0.29	0.81
Control Delay	54.1	3.7	1.3	15.5	13.6	2.9	37.1	0.6	36.5	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	3.7	1.3	15.5	13.6	2.9	37.1	0.6	36.5	13.8
Queue Length 50th (ft)	94	70	0	7	88	0	39	0	31	9
Queue Length 95th (ft)	m151	83	m1	32	176	46	71	0	60	109
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2525	1176	232	1849	983	334	417	301	779
Starvation Cap Reductn	0	146	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	0.31	0.51	0.03	0.13	0.34	0.28	0.22	0.07	0.19	0.73

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	806	67	53	385	123	98	401	106	230	716	244
v/c Ratio	0.61	0.72	0.12	0.41	0.42	0.25	0.56	0.47	0.23	0.78	0.60	0.38
Control Delay	62.3	35.6	5.0	61.2	32.9	7.3	61.3	34.0	7.4	64.3	32.9	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	35.6	5.0	61.2	32.9	7.3	61.3	34.0	7.4	64.3	32.9	13.6
Queue Length 50th (ft)	70	234	0	32	102	0	60	113	0	141	205	40
Queue Length 95th (ft)	163	403	24	90	188	47	143	188	42	#405	351	130
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	294	1636	775	294	1636	796	294	1636	787	294	1636	813
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.49	0.09	0.18	0.24	0.15	0.33	0.25	0.13	0.78	0.44	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	713	72	324	804	194	85	849	407	239	802	255
Future Volume (veh/h)	199	713	72	324	804	194	85	849	407	239	802	255
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	221	792	80	360	893	216	94	943	452	266	891	283
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	959	97	408	946	229	116	1108	516	223	1480	468
Arrive On Green	0.08	0.29	0.29	0.12	0.33	0.33	0.07	0.33	0.33	0.13	0.39	0.39
Sat Flow, veh/h	3456	3259	329	3456	2838	686	1781	3404	1585	1781	3841	1215
Grp Volume(v), veh/h	221	432	440	360	559	550	94	943	452	266	789	385
Grp Sat Flow(s),veh/h/ln	1728	1777	1811	1728	1777	1747	1781	1702	1585	1781	1702	1652
Q Serve(g_s), s	8.3	29.8	29.9	13.5	40.3	40.4	6.9	34.1	35.5	16.5	24.4	24.6
Cycle Q Clear(g_c), s	8.3	29.8	29.9	13.5	40.3	40.4	6.9	34.1	35.5	16.5	24.4	24.6
Prop In Lane	1.00		0.18	1.00		0.39	1.00		1.00	1.00		0.74
Lane Grp Cap(c), veh/h	273	523	533	408	593	583	116	1108	516	223	1312	637
V/C Ratio(X)	0.81	0.83	0.83	0.88	0.94	0.94	0.81	0.85	0.88	1.19	0.60	0.60
Avail Cap(c_a), veh/h	433	600	612	433	600	590	223	1150	535	223	1312	637
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.7	43.3	43.3	57.2	42.7	42.7	60.8	41.4	41.9	57.6	32.4	32.4
Incr Delay (d2), s/veh	2.7	8.9	8.8	17.1	23.7	24.2	4.9	6.4	15.2	122.1	0.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	14.1	14.4	6.8	21.1	20.8	3.2	15.0	15.8	14.9	10.1	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.4	52.3	52.1	74.3	66.4	66.9	65.7	47.8	57.1	179.7	33.3	34.4
LnGrp LOS	E	D	D	E	E	E	E	D	E	F	C	C
Approach Vol, veh/h		1093			1469			1489			1440	
Approach Delay, s/veh		54.3			68.5			51.8			60.6	
Approach LOS		D			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	49.4	20.0	48.4	19.1	44.3	12.1	56.3
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	10.3	42.4	18.5	37.5	15.5	31.9	8.9	26.6
Green Ext Time (p_c), s	0.1	1.6	0.0	5.5	0.1	5.6	0.0	9.8

Intersection Summary			
HCM 6th Ctrl Delay			59.1
HCM 6th LOS			E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	801	607	71	1341	0	48	0	200	0	0	0
Future Volume (veh/h)	5	801	607	71	1341	0	48	0	200	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	5	871	660	77	1458	0	52	0	217			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	284	1990	1141	198	3693	0	285	0	254			
Arrive On Green	0.56	0.56	0.56	0.22	1.00	0.00	0.16	0.00	0.16			
Sat Flow, veh/h	364	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	5	871	660	77	1458	0	52	0	217			
Grp Sat Flow(s),veh/h/ln	364	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.6	12.9	18.0	3.3	0.0	0.0	2.3	0.0	12.0			
Cycle Q Clear(g_c), s	0.6	12.9	18.0	3.3	0.0	0.0	2.3	0.0	12.0			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	284	1990	1141	198	3693	0	285	0	254			
V/C Ratio(X)	0.02	0.44	0.58	0.39	0.39	0.00	0.18	0.00	0.85			
Avail Cap(c_a), veh/h	284	1990	1141	303	3693	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.73	0.73	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.8	11.5	6.0	32.4	0.0	0.0	32.7	0.0	36.8			
Incr Delay (d2), s/veh	0.1	0.7	2.1	0.7	0.2	0.0	0.3	0.0	13.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	4.6	5.3	1.4	0.1	0.0	1.0	0.0	5.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.0	12.2	8.2	33.1	0.2	0.0	33.0	0.0	50.7			
LnGrp LOS	A	B	A	C	A	A	C	A	D			
Approach Vol, veh/h		1536			1535			269				
Approach Delay, s/veh		10.5			1.9			47.3				
Approach LOS		B			A			D				

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.7	55.8				70.5		19.5
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9
Max Q Clear Time (g_c+I1), s	5.3	20.0				2.0		14.0
Green Ext Time (p_c), s	0.1	11.8				22.6		0.4

Intersection Summary		
HCM 6th Ctrl Delay		9.5
HCM 6th LOS		A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	845	38	17	942	288	10	1	13	15	16	482
Future Volume (veh/h)	122	845	38	17	942	288	10	1	13	15	16	482
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	929	42	19	1035	316	11	1	14	16	18	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	2832	1263	449	2266	1011	192	14	137	107	97	
Arrive On Green	0.21	1.00	1.00	0.64	0.64	0.64	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1781	3554	1585	579	3554	1585	1333	165	1585	558	1124	1585
Grp Volume(v), veh/h	134	929	42	19	1035	316	12	0	14	34	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	579	1777	1585	1498	0	1585	1682	0	1585
Q Serve(g_s), s	6.3	0.0	0.0	1.1	13.4	8.1	0.0	0.0	0.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.3	0.0	0.0	1.1	13.4	8.1	0.5	0.0	0.7	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.92		1.00	0.47		1.00
Lane Grp Cap(c), veh/h	191	2832	1263	449	2266	1011	206	0	137	204	0	
V/C Ratio(X)	0.70	0.33	0.03	0.04	0.46	0.31	0.06	0.00	0.10	0.17	0.00	
Avail Cap(c_a), veh/h	501	2832	1263	449	2266	1011	398	0	350	422	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	0.0	6.1	8.3	7.4	37.8	0.0	37.9	38.3	0.0	0.0
Incr Delay (d2), s/veh	3.1	0.3	0.0	0.2	0.7	0.8	0.1	0.0	0.3	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.1	0.0	0.1	4.4	2.5	0.2	0.0	0.3	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	0.3	0.0	6.3	9.0	8.2	37.9	0.0	38.2	38.6	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1105			1370			26			34	A
Approach Delay, s/veh		4.7			8.8			38.1			38.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Timer - Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		77.1		12.9	14.3	62.8		12.9
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9
Max Q Clear Time (g_c+I1), s		2.0		3.5	8.3	15.4		2.7
Green Ext Time (p_c), s		12.1		0.1	0.2	9.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	7.7
HCM 6th LOS	A

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	80	126	0
Future Vol, veh/h	0	0	0	80	126	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	87	137	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	224	137	137	0	-	0
Stage 1	137	-	-	-	-	-
Stage 2	87	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	764	911	1447	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	936	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	764	911	1447	-	-	-
Mov Cap-2 Maneuver	764	-	-	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	936	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1447	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	53	747	9	7	1097	27	6	0	4	9	0	117
Future Vol, veh/h	53	747	9	7	1097	27	6	0	4	9	0	117
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	61	859	10	8	1261	31	7	0	5	10	0	134

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1292	0	0	869	0	0	1633	2294	435	1845	2284	646
Stage 1	-	-	-	-	-	-	986	986	-	1293	1293	-
Stage 2	-	-	-	-	-	-	647	1308	-	552	991	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	532	-	-	1080	-	-	112	41	*804	*69	42	414
Stage 1	-	-	-	-	-	-	518	500	-	*172	231	-
Stage 2	-	-	-	-	-	-	426	228	-	*758	496	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	532	-	-	1080	-	-	69	36	*804	*62	37	414
Mov Cap-2 Maneuver	-	-	-	-	-	-	69	36	-	*62	37	-
Stage 1	-	-	-	-	-	-	458	443	-	*152	229	-
Stage 2	-	-	-	-	-	-	285	226	-	*667	439	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	41.9	21.8
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	109	532	-	-	1080	-	-	62	414
HCM Lane V/C Ratio	0.105	0.115	-	-	0.007	-	-	0.167	0.325
HCM Control Delay (s)	41.9	12.6	-	-	8.4	-	-	74.4	17.8
HCM Lane LOS	E	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.3	0.4	-	-	0	-	-	0.6	1.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	171	475	46	75	534	259	69	470	79	143	379	111
Future Volume (veh/h)	171	475	46	75	534	259	69	470	79	143	379	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	204	565	55	89	636	308	82	560	94	170	451	132
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	239	1270	567	114	1020	455	105	829	370	204	1028	458
Arrive On Green	0.14	0.36	0.36	0.06	0.29	0.29	0.06	0.24	0.24	0.12	0.29	0.29
Sat Flow, veh/h	1753	3497	1560	1753	3497	1560	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	204	565	55	89	636	308	82	560	94	170	451	132
Grp Sat Flow(s),veh/h/ln	1753	1749	1560	1753	1749	1560	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	9.9	10.7	2.0	4.4	13.7	15.2	4.0	12.7	4.3	8.3	9.1	5.7
Cycle Q Clear(g_c), s	9.9	10.7	2.0	4.4	13.7	15.2	4.0	12.7	4.3	8.3	9.1	5.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	239	1270	567	114	1020	455	105	829	370	204	1028	458
V/C Ratio(X)	0.85	0.44	0.10	0.78	0.62	0.68	0.78	0.68	0.25	0.83	0.44	0.29
Avail Cap(c_a), veh/h	322	1787	797	322	1787	797	322	1787	797	322	1787	797
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	21.1	18.3	40.1	26.7	27.2	40.4	30.2	27.0	37.6	24.9	23.7
Incr Delay (d2), s/veh	12.0	0.3	0.1	4.4	0.9	2.5	4.7	1.4	0.5	5.3	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	4.1	0.7	1.9	5.5	5.6	1.8	5.2	1.6	3.7	3.6	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	21.4	18.4	44.5	27.6	29.7	45.0	31.6	27.5	43.0	25.4	24.2
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		824			1033			736			753	
Approach Delay, s/veh		28.0			29.7			32.5			29.1	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	37.1	9.2	31.1	15.9	30.9	14.2	26.2				
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5				
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5				
Max Q Clear Time (g_c+I1), s	6.4	12.7	6.0	11.1	11.9	17.2	10.3	14.7				
Green Ext Time (p_c), s	0.0	5.9	0.0	5.1	0.1	8.2	0.1	6.0				
Intersection Summary												
HCM 6th Ctrl Delay			29.8									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	221	872	360	1109	94	1395	266	1174
v/c Ratio	0.70	0.84	0.89	0.99	0.65	0.90	1.24	0.67
Control Delay	72.0	51.8	84.1	68.8	81.3	49.8	189.1	37.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.0	51.8	84.1	68.8	81.3	49.8	189.1	37.9
Queue Length 50th (ft)	100	381	165	510	83	410	~298	307
Queue Length 95th (ft)	143	465	#256	#703	142	487	#487	392
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	417	1111	417	1121	215	1594	215	1743
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.78	0.86	0.99	0.44	0.88	1.24	0.67

Intersection Summary

~ 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	5	871	660	77	1458	52	217
v/c Ratio	0.03	0.41	0.47	0.37	0.39	0.23	0.56
Control Delay	9.8	10.6	1.6	38.2	4.1	37.2	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	9.8	10.6	1.6	38.2	4.2	37.2	11.0
Queue Length 50th (ft)	1	124	5	43	75	28	0
Queue Length 95th (ft)	7	209	29	m75	108	58	59
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	196	2123	1476	300	3721	391	519
Starvation Cap Reductn	0	0	0	0	794	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.41	0.45	0.26	0.50	0.13	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	134	929	42	19	1035	316	12	14	34	530
v/c Ratio	0.55	0.37	0.04	0.06	0.55	0.32	0.06	0.05	0.14	0.80
Control Delay	51.8	2.3	0.3	13.3	15.8	4.3	30.9	0.3	33.0	13.7
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	2.3	0.3	13.3	15.8	4.3	30.9	0.3	33.0	13.7
Queue Length 50th (ft)	57	11	0	4	167	13	6	0	18	10
Queue Length 95th (ft)	141	56	0	20	321	71	20	0	40	107
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2528	1180	315	1881	985	329	417	361	748
Starvation Cap Reductn	0	429	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	0.27	0.44	0.04	0.06	0.55	0.32	0.04	0.03	0.09	0.71

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	204	565	55	89	636	308	82	560	94	170	451	132
v/c Ratio	0.73	0.45	0.09	0.55	0.68	0.48	0.54	0.68	0.21	0.70	0.42	0.23
Control Delay	60.4	28.6	2.9	60.3	37.6	6.2	60.4	40.4	8.2	60.6	31.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.4	28.6	2.9	60.3	37.6	6.2	60.4	40.4	8.2	60.6	31.0	6.5
Queue Length 50th (ft)	129	153	0	57	195	0	52	176	0	105	123	0
Queue Length 95th (ft)	#269	225	11	111	260	47	105	240	35	#207	187	38
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	278	1548	738	278	1548	863	278	1548	744	278	1548	765
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.36	0.07	0.32	0.41	0.36	0.29	0.36	0.13	0.61	0.29	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	849	106	349	771	204	121	867	493	372	1037	364
Future Volume (veh/h)	297	849	106	349	771	204	121	867	493	372	1037	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	300	858	107	353	779	206	122	876	498	376	1047	368
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	965	120	400	885	234	146	1113	518	216	1367	480
Arrive On Green	0.10	0.30	0.30	0.12	0.32	0.32	0.08	0.33	0.33	0.12	0.37	0.37
Sat Flow, veh/h	3456	3179	396	3456	2780	735	1781	3404	1585	1781	3728	1310
Grp Volume(v), veh/h	300	480	485	353	498	487	122	876	498	376	956	459
Grp Sat Flow(s),veh/h/ln	1728	1777	1799	1728	1777	1738	1781	1702	1585	1781	1702	1635
Q Serve(g_s), s	11.6	35.0	35.0	13.7	36.1	36.1	9.2	31.7	41.9	16.5	33.6	33.6
Cycle Q Clear(g_c), s	11.6	35.0	35.0	13.7	36.1	36.1	9.2	31.7	41.9	16.5	33.6	33.6
Prop In Lane	1.00		0.22	1.00		0.42	1.00		1.00	1.00		0.80
Lane Grp Cap(c), veh/h	349	539	546	400	565	553	146	1113	518	216	1248	599
V/C Ratio(X)	0.86	0.89	0.89	0.88	0.88	0.88	0.84	0.79	0.96	1.74	0.77	0.77
Avail Cap(c_a), veh/h	420	582	589	420	582	569	216	1115	519	216	1248	599
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.1	45.1	45.1	59.2	43.9	43.9	61.5	41.5	44.9	59.7	37.9	37.9
Incr Delay (d2), s/veh	12.5	15.4	15.3	17.9	14.7	15.0	11.0	4.0	30.0	350.9	3.1	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	17.4	17.6	6.9	17.8	17.5	4.6	13.8	20.5	28.5	14.4	14.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.6	60.6	60.4	77.1	58.6	58.9	72.5	45.5	74.8	410.6	41.0	44.2
LnGrp LOS	E	E	E	E	E	E	E	D	E	F	D	D
Approach Vol, veh/h		1265			1338			1496			1791	
Approach Delay, s/veh		63.4			63.6			57.5			119.4	
Approach LOS		E			E			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.2	48.7	20.0	49.9	19.2	46.8	14.6	55.3				
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5				
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5				
Max Q Clear Time (g_c+I1), s	13.6	38.1	18.5	43.9	15.7	37.0	11.2	35.6				
Green Ext Time (p_c), s	0.1	3.9	0.0	0.5	0.1	4.3	0.0	6.7				
Intersection Summary												
HCM 6th Ctrl Delay			79.0									
HCM 6th LOS			E									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1381	946	70	1210	0	36	0	63	0	0	0
Future Volume (veh/h)	7	1381	946	70	1210	0	36	0	63	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	7	1454	996	74	1274	0	38	0	66			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	348	2193	1141	198	3985	0	183	0	163			
Arrive On Green	0.62	0.62	0.62	0.22	1.00	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	434	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	7	1454	996	74	1274	0	38	0	66			
Grp Sat Flow(s),veh/h/ln	434	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.6	23.9	42.6	3.2	0.0	0.0	1.8	0.0	3.5			
Cycle Q Clear(g_c), s	0.6	23.9	42.6	3.2	0.0	0.0	1.8	0.0	3.5			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	348	2193	1141	198	3985	0	183	0	163			
V/C Ratio(X)	0.02	0.66	0.87	0.37	0.32	0.00	0.21	0.00	0.40			
Avail Cap(c_a), veh/h	348	2193	1141	303	3985	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	6.7	11.2	9.5	32.3	0.0	0.0	37.0	0.0	37.8			
Incr Delay (d2), s/veh	0.1	1.6	9.3	0.7	0.2	0.0	0.6	0.0	1.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	8.1	14.0	1.3	0.1	0.0	0.8	0.0	1.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.8	12.8	18.8	33.0	0.2	0.0	37.6	0.0	39.4			
LnGrp LOS	A	B	B	C	A	A	D	A	D			
Approach Vol, veh/h		2457			1348			104				
Approach Delay, s/veh		15.2			2.0			38.7				
Approach LOS		B			A			D				

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.7	60.9				75.6		14.4
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9
Max Q Clear Time (g_c+I1), s	5.2	44.6				2.0		5.5
Green Ext Time (p_c), s	0.1	0.0				18.2		0.2

Intersection Summary	
HCM 6th Ctrl Delay	11.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	1273	30	29	697	256	36	32	28	38	12	564
Future Volume (veh/h)	156	1273	30	29	697	256	36	32	28	38	12	564
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	166	1354	32	31	741	272	38	34	30	40	13	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	2752	1228	318	2168	967	141	108	172	149	39	
Arrive On Green	0.22	1.00	1.00	0.61	0.61	0.61	0.11	0.11	0.11	0.11	0.11	0.00
Sat Flow, veh/h	1781	3554	1585	390	3554	1585	737	993	1585	725	360	1585
Grp Volume(v), veh/h	166	1354	32	31	741	272	72	0	30	53	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	390	1777	1585	1730	0	1585	1085	0	1585
Q Serve(g_s), s	8.0	0.0	0.0	3.0	9.2	7.3	0.0	0.0	1.5	2.3	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0	3.0	9.2	7.3	3.3	0.0	1.5	5.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.53		1.00	0.75		1.00
Lane Grp Cap(c), veh/h	200	2752	1228	318	2168	967	249	0	172	188	0	
V/C Ratio(X)	0.83	0.49	0.03	0.10	0.34	0.28	0.29	0.00	0.17	0.28	0.00	
Avail Cap(c_a), veh/h	501	2752	1228	318	2168	967	428	0	350	350	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.1	0.0	0.0	7.4	8.6	8.3	37.2	0.0	36.4	38.7	0.0	0.0
Incr Delay (d2), s/veh	4.5	0.4	0.0	0.6	0.4	0.7	0.6	0.0	0.5	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.2	0.0	0.3	3.1	2.3	1.5	0.0	0.6	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	0.4	0.0	8.0	9.1	9.0	37.8	0.0	36.9	39.5	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1552			1044			102			53	A
Approach Delay, s/veh		4.5			9.0			37.5			39.5	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		75.1		14.9	14.8	60.3		14.9
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9
Max Q Clear Time (g_c+I1), s		2.0		7.6	10.0	11.2		5.3
Green Ext Time (p_c), s		21.8		0.1	0.3	8.2		0.3

Intersection Summary	
HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	104	155	0
Future Vol, veh/h	0	0	0	104	155	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	113	168	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	281	168	168	0	-	0
Stage 1	168	-	-	-	-	-
Stage 2	113	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	709	876	1410	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	709	876	1410	-	-	-
Mov Cap-2 Maneuver	709	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	912	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1410	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	1234	5	3	857	22	5	0	11	67	0	88
Future Vol, veh/h	87	1234	5	3	857	22	5	0	11	67	0	88
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	91	1285	5	3	893	23	5	0	11	70	0	92

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	916	0	0	1290	0	0	1923	2392	645	1736	2383	458
Stage 1	-	-	-	-	-	-	1470	1470	-	911	911	-
Stage 2	-	-	-	-	-	-	453	922	-	825	1472	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	740	-	-	*897	-	-	100	38	*600	*175	39	550
Stage 1	-	-	-	-	-	-	413	392	-	*295	351	-
Stage 2	-	-	-	-	-	-	556	347	-	*565	391	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	740	-	-	*897	-	-	75	33	*600	*155	34	550
Mov Cap-2 Maneuver	-	-	-	-	-	-	75	33	-	*155	34	-
Stage 1	-	-	-	-	-	-	362	344	-	*259	350	-
Stage 2	-	-	-	-	-	-	462	346	-	*486	343	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	26	27.2
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	188	740	-	-	* 897	-	-	155	550
HCM Lane V/C Ratio	0.089	0.122	-	-	0.003	-	-	0.45	0.167
HCM Control Delay (s)	26	10.5	-	-	9	-	-	46	12.9
HCM Lane LOS	D	B	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0.3	0.4	-	-	0	-	-	2.1	0.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	896	63	50	480	116	94	377	100	216	673	226
Future Volume (veh/h)	106	896	63	50	480	116	94	377	100	216	673	226
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	113	953	67	53	511	123	100	401	106	230	716	240
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	142	1279	571	67	1130	504	127	774	345	265	1050	468
Arrive On Green	0.08	0.37	0.37	0.04	0.33	0.33	0.07	0.22	0.22	0.15	0.30	0.30
Sat Flow, veh/h	1739	3469	1547	1739	3469	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	113	953	67	53	511	123	100	401	106	230	716	240
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1739	1735	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	5.6	20.9	2.5	2.6	10.2	5.1	4.9	8.9	5.0	11.3	15.9	11.2
Cycle Q Clear(g_c), s	5.6	20.9	2.5	2.6	10.2	5.1	4.9	8.9	5.0	11.3	15.9	11.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	142	1279	571	67	1130	504	127	774	345	265	1050	468
V/C Ratio(X)	0.80	0.75	0.12	0.79	0.45	0.24	0.79	0.52	0.31	0.87	0.68	0.51
Avail Cap(c_a), veh/h	318	1765	787	318	1765	787	318	1765	787	318	1765	787
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.4	24.0	18.2	41.7	23.3	21.6	39.9	29.8	28.3	36.2	26.8	25.2
Incr Delay (d2), s/veh	3.8	1.5	0.1	7.5	0.4	0.4	4.1	0.8	0.7	17.1	1.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	8.1	0.9	1.2	4.0	1.8	2.2	3.6	1.8	5.8	6.3	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	25.5	18.3	49.2	23.7	22.0	44.0	30.6	29.0	53.4	27.9	26.4
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1133			687			607			1186	
Approach Delay, s/veh		26.8			25.4			32.5			32.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	37.7	10.4	32.0	11.1	34.0	17.3	25.0
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	4.6	22.9	6.9	17.9	7.6	12.2	13.3	10.9
Green Ext Time (p_c), s	0.0	9.3	0.0	8.6	0.0	5.7	0.1	4.4

Intersection Summary			
HCM 6th Ctrl Delay			29.4
HCM 6th LOS			C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	300	965	353	985	122	1374	376	1415
v/c Ratio	0.81	0.91	0.89	0.91	0.74	0.89	1.76	0.85
Control Delay	76.8	57.8	84.0	56.7	86.0	49.2	393.2	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.8	57.8	84.0	56.7	86.0	49.2	393.2	46.0
Queue Length 50th (ft)	138	437	165	444	110	407	~513	422
Queue Length 95th (ft)	190	#557	#250	#575	177	472	#718	#509
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	416	1106	416	1112	214	1593	214	1669
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.87	0.85	0.89	0.57	0.86	1.76	0.85

Intersection Summary

~ 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	7	1454	996	74	1274	38	66
v/c Ratio	0.03	0.70	0.71	0.36	0.35	0.15	0.22
Control Delay	11.3	16.9	4.8	45.1	3.5	33.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	16.9	4.8	45.1	3.5	33.3	6.3
Queue Length 50th (ft)	1	276	47	44	49	20	0
Queue Length 95th (ft)	10	#536	151	m72	106	43	23
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	232	2071	1464	300	3642	391	417
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.70	0.68	0.25	0.35	0.10	0.16

Intersection Summary

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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	166	1354	32	31	741	272	72	30	53	600
v/c Ratio	0.62	0.55	0.03	0.16	0.42	0.29	0.29	0.09	0.23	0.85
Control Delay	57.1	4.1	1.2	18.2	16.1	3.1	34.1	0.5	33.1	18.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.1	4.2	1.2	18.2	16.1	3.1	34.1	0.5	33.1	18.3
Queue Length 50th (ft)	103	73	0	9	125	0	37	0	27	35
Queue Length 95th (ft)	m149	94	m0	34	219	46	71	0	56	#173
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2462	1148	192	1760	946	341	419	312	764
Starvation Cap Reductn	0	132	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	0.33	0.58	0.03	0.16	0.42	0.29	0.21	0.07	0.17	0.79

Intersection Summary

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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	953	67	53	511	123	100	401	106	230	716	240
v/c Ratio	0.63	0.78	0.11	0.43	0.50	0.23	0.59	0.47	0.23	0.84	0.67	0.41
Control Delay	66.6	37.8	4.9	65.0	33.7	7.0	65.7	36.2	7.5	73.7	37.5	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	37.8	4.9	65.0	33.7	7.0	65.7	36.2	7.5	73.7	37.5	14.7
Queue Length 50th (ft)	78	304	0	37	147	0	69	127	0	162	237	46
Queue Length 95th (ft)	162	498	24	90	253	47	146	188	42	#405	351	128
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	275	1532	731	275	1532	753	275	1532	744	275	1532	771
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.62	0.09	0.19	0.33	0.16	0.36	0.26	0.14	0.84	0.47	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	717	72	327	808	196	85	849	409	241	802	255
Future Volume (veh/h)	199	717	72	327	808	196	85	849	409	241	802	255
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	221	797	80	363	898	218	94	943	454	268	891	283
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	959	96	411	947	230	116	1109	516	223	1480	468
Arrive On Green	0.08	0.29	0.29	0.12	0.33	0.33	0.07	0.33	0.33	0.12	0.39	0.39
Sat Flow, veh/h	3456	3261	327	3456	2836	688	1781	3404	1585	1781	3841	1215
Grp Volume(v), veh/h	221	434	443	363	562	554	94	943	454	268	789	385
Grp Sat Flow(s),veh/h/ln	1728	1777	1811	1728	1777	1747	1781	1702	1585	1781	1702	1652
Q Serve(g_s), s	8.3	30.1	30.2	13.7	40.7	40.8	6.9	34.1	35.7	16.5	24.5	24.6
Cycle Q Clear(g_c), s	8.3	30.1	30.2	13.7	40.7	40.8	6.9	34.1	35.7	16.5	24.5	24.6
Prop In Lane	1.00		0.18	1.00		0.39	1.00		1.00	1.00		0.74
Lane Grp Cap(c), veh/h	273	522	533	411	593	583	116	1109	516	223	1312	636
V/C Ratio(X)	0.81	0.83	0.83	0.88	0.95	0.95	0.81	0.85	0.88	1.20	0.60	0.60
Avail Cap(c_a), veh/h	432	599	611	432	599	589	223	1147	534	223	1312	636
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.8	43.5	43.5	57.2	42.9	42.9	60.9	41.5	42.1	57.8	32.5	32.5
Incr Delay (d2), s/veh	2.7	9.4	9.2	17.5	24.7	25.2	4.9	6.4	15.6	126.3	0.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	14.3	14.6	6.9	21.4	21.2	3.3	15.1	16.0	15.2	10.2	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.5	52.9	52.8	74.7	67.5	68.1	65.8	47.9	57.7	184.1	33.4	34.4
LnGrp LOS	E	D	D	E	E	E	E	D	E	F	C	C
Approach Vol, veh/h		1098			1479			1491			1442	
Approach Delay, s/veh		54.8			69.5			52.0			61.7	
Approach LOS		D			E			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.9	49.6	20.0	48.5	19.2	44.3	12.1	56.4				
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5				
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5				
Max Q Clear Time (g_c+I1), s	10.3	42.8	18.5	37.7	15.7	32.2	8.9	26.6				
Green Ext Time (p_c), s	0.1	1.3	0.0	5.3	0.1	5.6	0.0	9.8				
Intersection Summary												
HCM 6th Ctrl Delay			59.8									
HCM 6th LOS			E									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	813	607	78	1352	0	48	0	212	0	0	0
Future Volume (veh/h)	5	813	607	78	1352	0	48	0	212	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	5	884	660	85	1470	0	52	0	230			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	279	1962	1141	198	3652	0	299	0	266			
Arrive On Green	0.55	0.55	0.55	0.22	1.00	0.00	0.17	0.00	0.17			
Sat Flow, veh/h	360	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	5	884	660	85	1470	0	52	0	230			
Grp Sat Flow(s),veh/h/ln	360	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.6	13.4	18.0	3.7	0.0	0.0	2.3	0.0	12.7			
Cycle Q Clear(g_c), s	0.6	13.4	18.0	3.7	0.0	0.0	2.3	0.0	12.7			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	279	1962	1141	198	3652	0	299	0	266			
V/C Ratio(X)	0.02	0.45	0.58	0.43	0.40	0.00	0.17	0.00	0.86			
Avail Cap(c_a), veh/h	279	1962	1141	303	3652	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.72	0.72	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	9.2	12.0	6.0	32.5	0.0	0.0	32.1	0.0	36.4			
Incr Delay (d2), s/veh	0.1	0.8	2.1	0.8	0.2	0.0	0.3	0.0	15.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	4.8	5.3	1.5	0.1	0.0	1.0	0.0	6.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.3	12.8	8.2	33.3	0.2	0.0	32.4	0.0	52.1			
LnGrp LOS	A	B	A	C	A	A	C	A	D			
Approach Vol, veh/h		1549			1555			282				
Approach Delay, s/veh		10.8			2.0			48.5				
Approach LOS		B			A			D				

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.7	55.1				69.8		20.2
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9
Max Q Clear Time (g_c+I1), s	5.7	20.0				2.0		14.7
Green Ext Time (p_c), s	0.1	11.9				22.9		0.4

Intersection Summary			
HCM 6th Ctrl Delay			9.9
HCM 6th LOS			A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	869	38	17	960	299	10	1	13	23	16	482
Future Volume (veh/h)	122	869	38	17	960	299	10	1	13	23	16	482
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	955	42	19	1055	329	11	1	14	25	18	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	2815	1255	437	2248	1003	200	15	145	132	79	
Arrive On Green	0.21	1.00	1.00	0.63	0.63	0.63	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1781	3554	1585	565	3554	1585	1352	164	1585	754	862	1585
Grp Volume(v), veh/h	134	955	42	19	1055	329	12	0	14	43	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	565	1777	1585	1516	0	1585	1616	0	1585
Q Serve(g_s), s	6.3	0.0	0.0	1.2	14.0	8.7	0.0	0.0	0.7	0.6	0.0	0.0
Cycle Q Clear(g_c), s	6.3	0.0	0.0	1.2	14.0	8.7	0.5	0.0	0.7	2.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.92		1.00	0.58		1.00
Lane Grp Cap(c), veh/h	191	2815	1255	437	2248	1003	215	0	145	211	0	
V/C Ratio(X)	0.70	0.34	0.03	0.04	0.47	0.33	0.06	0.00	0.10	0.20	0.00	
Avail Cap(c_a), veh/h	501	2815	1255	437	2248	1003	400	0	350	414	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	0.0	6.3	8.6	7.7	37.4	0.0	37.5	38.0	0.0	0.0
Incr Delay (d2), s/veh	3.1	0.3	0.0	0.2	0.7	0.9	0.1	0.0	0.3	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.1	0.0	0.1	4.6	2.7	0.2	0.0	0.3	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	0.3	0.0	6.5	9.3	8.5	37.5	0.0	37.8	38.5	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1131			1403			26			43	A
Approach Delay, s/veh		4.6			9.1			37.7			38.5	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		76.7		13.3	14.3	62.3		13.3
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9
Max Q Clear Time (g_c+I1), s		2.0		4.0	8.3	16.0		2.7
Green Ext Time (p_c), s		12.6		0.1	0.2	8.9		0.0

Intersection Summary	
HCM 6th Ctrl Delay	7.9
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	37	42	80	126	7
Future Vol, veh/h	7	37	42	80	126	7
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	40	46	87	137	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	320	141	145	0	-	0
Stage 1	141	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	673	907	1437	-	-	-
Stage 1	886	-	-	-	-	-
Stage 2	852	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	650	907	1437	-	-	-
Mov Cap-2 Maneuver	650	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1437	-	853	-	-
HCM Lane V/C Ratio	0.032	-	0.056	-	-
HCM Control Delay (s)	7.6	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	747	9	7	1097	36	6	0	4	18	0	145
Future Vol, veh/h	85	747	9	7	1097	36	6	0	4	18	0	145
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	98	859	10	8	1261	41	7	0	5	21	0	167

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1302	0	0	869	0	0	1707	2378	435	1924	2363	651
Stage 1	-	-	-	-	-	-	1060	1060	-	1298	1298	-
Stage 2	-	-	-	-	-	-	647	1318	-	626	1065	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	528	-	-	1080	-	-	95	35	*804	*57	36	411
Stage 1	-	-	-	-	-	-	453	452	-	*171	230	-
Stage 2	-	-	-	-	-	-	426	225	-	*758	449	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	528	-	-	1080	-	-	48	28	*804	*48	29	411
Mov Cap-2 Maneuver	-	-	-	-	-	-	48	28	-	*48	29	-
Stage 1	-	-	-	-	-	-	368	368	-	*139	228	-
Stage 2	-	-	-	-	-	-	251	223	-	*613	365	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.1	59.8	31.6
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	77	528	-	-	1080	-	-	48	411
HCM Lane V/C Ratio	0.149	0.185	-	-	0.007	-	-	0.431	0.406
HCM Control Delay (s)	59.8	13.4	-	-	8.4	-	-	127.9	19.6
HCM Lane LOS	F	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.5	0.7	-	-	0	-	-	1.6	1.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	477	48	75	536	259	72	470	79	143	379	116
Future Volume (veh/h)	176	477	48	75	536	259	72	470	79	143	379	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	210	568	57	89	638	308	86	560	94	170	451	138
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	245	1279	571	114	1017	454	110	827	369	204	1015	453
Arrive On Green	0.14	0.37	0.37	0.06	0.29	0.29	0.06	0.24	0.24	0.12	0.29	0.29
Sat Flow, veh/h	1753	3497	1560	1753	3497	1560	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	210	568	57	89	638	308	86	560	94	170	451	138
Grp Sat Flow(s),veh/h/ln	1753	1749	1560	1753	1749	1560	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	10.3	10.8	2.1	4.4	13.9	15.3	4.2	12.8	4.3	8.3	9.2	6.0
Cycle Q Clear(g_c), s	10.3	10.8	2.1	4.4	13.9	15.3	4.2	12.8	4.3	8.3	9.2	6.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	245	1279	571	114	1017	454	110	827	369	204	1015	453
V/C Ratio(X)	0.86	0.44	0.10	0.78	0.63	0.68	0.78	0.68	0.25	0.83	0.44	0.30
Avail Cap(c_a), veh/h	319	1772	790	319	1772	790	319	1772	790	319	1772	790
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	21.1	18.3	40.5	27.0	27.5	40.6	30.5	27.2	38.0	25.4	24.3
Incr Delay (d2), s/veh	13.5	0.3	0.1	4.4	0.9	2.5	4.5	1.4	0.5	5.7	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	4.2	0.7	2.0	5.6	5.7	1.9	5.3	1.6	3.7	3.7	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.4	21.4	18.4	44.8	27.9	30.0	45.1	31.9	27.8	43.6	25.8	24.8
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		835			1035			740			759	
Approach Delay, s/veh		28.5			30.0			32.9			29.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	37.6	9.5	31.0	16.3	31.0	14.2	26.3
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	6.4	12.8	6.2	11.2	12.3	17.3	10.3	14.8
Green Ext Time (p_c), s	0.0	5.9	0.0	5.2	0.1	8.2	0.1	6.0

Intersection Summary	
HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	221	877	363	1116	94	1397	268	1174
v/c Ratio	0.69	0.84	0.90	1.00	0.65	0.90	1.25	0.67
Control Delay	71.9	52.1	84.8	70.2	81.4	50.0	192.3	37.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	52.1	84.8	70.2	81.4	50.0	192.3	37.9
Queue Length 50th (ft)	101	384	168	516	83	413	~302	308
Queue Length 95th (ft)	143	469	#260	#711	142	489	#493	392
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	417	1110	417	1121	215	1593	215	1743
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.79	0.87	1.00	0.44	0.88	1.25	0.67

Intersection Summary

~ 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	5	884	660	85	1470	52	230
v/c Ratio	0.03	0.42	0.47	0.40	0.40	0.23	0.57
Control Delay	10.2	11.0	1.7	38.6	4.2	37.0	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	10.2	11.0	1.7	38.6	4.3	37.0	11.0
Queue Length 50th (ft)	1	127	9	48	76	28	0
Queue Length 95th (ft)	7	218	36	m82	115	57	61
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	192	2112	1469	300	3717	391	529
Starvation Cap Reductn	0	0	0	0	763	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.42	0.45	0.28	0.50	0.13	0.43

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	134	955	42	19	1055	329	12	14	43	530
v/c Ratio	0.55	0.38	0.04	0.06	0.56	0.33	0.06	0.05	0.19	0.80
Control Delay	52.4	2.4	0.3	13.4	16.0	4.5	30.9	0.3	34.0	13.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	2.5	0.3	13.4	16.0	4.5	30.9	0.3	34.0	13.8
Queue Length 50th (ft)	61	11	0	4	172	15	6	0	23	10
Queue Length 95th (ft)	141	58	m1	20	330	76	20	0	48	108
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2527	1180	307	1880	987	327	417	345	747
Starvation Cap Reductn	0	397	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	0.27	0.45	0.04	0.06	0.56	0.33	0.04	0.03	0.12	0.71

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	568	57	89	638	308	86	560	94	170	451	138
v/c Ratio	0.76	0.45	0.09	0.56	0.68	0.48	0.54	0.68	0.21	0.70	0.42	0.24
Control Delay	62.1	28.6	3.2	60.4	37.6	6.1	60.3	40.4	8.2	60.6	31.3	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.1	28.6	3.2	60.4	37.6	6.1	60.3	40.4	8.2	60.6	31.3	6.5
Queue Length 50th (ft)	133	154	0	57	196	0	55	176	0	105	124	0
Queue Length 95th (ft)	#281	226	12	111	261	47	109	240	35	#207	188	39
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	278	1547	737	278	1547	862	278	1547	744	278	1547	768
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.37	0.08	0.32	0.41	0.36	0.31	0.36	0.13	0.61	0.29	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	852	106	350	774	205	121	867	494	373	1037	364
Future Volume (veh/h)	297	852	106	350	774	205	121	867	494	373	1037	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	300	861	107	354	782	207	122	876	499	377	1047	368
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	967	120	401	886	235	146	1112	518	216	1365	480
Arrive On Green	0.10	0.30	0.30	0.12	0.32	0.32	0.08	0.33	0.33	0.12	0.37	0.37
Sat Flow, veh/h	3456	3181	395	3456	2779	736	1781	3404	1585	1781	3728	1310
Grp Volume(v), veh/h	300	481	487	354	500	489	122	876	499	377	956	459
Grp Sat Flow(s),veh/h/ln	1728	1777	1799	1728	1777	1738	1781	1702	1585	1781	1702	1635
Q Serve(g_s), s	11.6	35.2	35.2	13.7	36.3	36.3	9.2	31.8	42.1	16.5	33.7	33.7
Cycle Q Clear(g_c), s	11.6	35.2	35.2	13.7	36.3	36.3	9.2	31.8	42.1	16.5	33.7	33.7
Prop In Lane	1.00		0.22	1.00		0.42	1.00		1.00	1.00		0.80
Lane Grp Cap(c), veh/h	349	540	547	401	567	554	146	1112	518	216	1246	598
V/C Ratio(X)	0.86	0.89	0.89	0.88	0.88	0.88	0.84	0.79	0.96	1.75	0.77	0.77
Avail Cap(c_a), veh/h	419	581	588	419	581	568	216	1113	518	216	1246	598
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.2	45.2	45.2	59.3	43.9	43.9	61.6	41.6	45.0	59.8	38.0	38.0
Incr Delay (d2), s/veh	12.5	15.7	15.5	18.1	15.0	15.3	11.1	4.1	30.6	354.0	3.1	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	17.5	17.7	6.9	17.9	17.6	4.6	13.8	20.7	28.6	14.4	14.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.7	60.9	60.7	77.3	58.9	59.2	72.7	45.6	75.6	413.8	41.1	44.3
LnGrp LOS	E	E	E	E	E	E	E	D	E	F	D	D
Approach Vol, veh/h		1268			1343			1497			1792	
Approach Delay, s/veh		63.6			63.9			57.8			120.4	
Approach LOS		E			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	48.9	20.0	49.9	19.3	46.9	14.6	55.3
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	13.6	38.3	18.5	44.1	15.7	37.2	11.2	35.7
Green Ext Time (p_c), s	0.1	3.8	0.0	0.3	0.0	4.2	0.0	6.7

Intersection Summary	
HCM 6th Ctrl Delay	79.4
HCM 6th LOS	E

HCM 6th Signalized Intersection Summary
2: I-405 SB Ramps & Carson Street

01/13/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1386	946	74	1215	0	36	0	69	0	0	0
Future Volume (veh/h)	7	1386	946	74	1215	0	36	0	69	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	7	1459	996	78	1279	0	38	0	73			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	346	2188	1141	198	3978	0	186	0	165			
Arrive On Green	0.62	0.62	0.62	0.22	1.00	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	432	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	7	1459	996	78	1279	0	38	0	73			
Grp Sat Flow(s),veh/h/ln	432	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.6	24.1	42.6	3.4	0.0	0.0	1.8	0.0	3.9			
Cycle Q Clear(g_c), s	0.6	24.1	42.6	3.4	0.0	0.0	1.8	0.0	3.9			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	346	2188	1141	198	3978	0	186	0	165			
V/C Ratio(X)	0.02	0.67	0.87	0.39	0.32	0.00	0.20	0.00	0.44			
Avail Cap(c_a), veh/h	346	2188	1141	303	3978	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	6.8	11.3	9.5	32.4	0.0	0.0	36.9	0.0	37.9			
Incr Delay (d2), s/veh	0.1	1.6	9.3	0.7	0.2	0.0	0.5	0.0	1.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	8.2	14.0	1.4	0.1	0.0	0.8	0.0	1.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.9	12.9	18.8	33.1	0.2	0.0	37.4	0.0	39.7			
LnGrp LOS	A	B	B	C	A	A	D	A	D			
Approach Vol, veh/h		2462			1357			111				
Approach Delay, s/veh		15.3			2.1			38.9				
Approach LOS		B			A			D				

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.7	60.8				75.5		14.5
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9
Max Q Clear Time (g_c+I1), s	5.4	44.6				2.0		5.9
Green Ext Time (p_c), s	0.1	0.0				18.4		0.2

Intersection Summary		
HCM 6th Ctrl Delay		11.4
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	1284	30	29	707	262	36	32	28	41	12	564
Future Volume (veh/h)	156	1284	30	29	707	262	36	32	28	41	12	564
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	166	1366	32	31	752	279	38	34	30	44	13	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	2752	1227	315	2167	967	142	108	173	151	36	
Arrive On Green	0.22	1.00	1.00	0.61	0.61	0.61	0.11	0.11	0.11	0.11	0.11	0.00
Sat Flow, veh/h	1781	3554	1585	386	3554	1585	739	994	1585	737	330	1585
Grp Volume(v), veh/h	166	1366	32	31	752	279	72	0	30	57	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	386	1777	1585	1734	0	1585	1068	0	1585
Q Serve(g_s), s	8.0	0.0	0.0	3.1	9.4	7.5	0.0	0.0	1.5	2.7	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0	3.1	9.4	7.5	3.3	0.0	1.5	5.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.53		1.00	0.77		1.00
Lane Grp Cap(c), veh/h	200	2752	1227	315	2167	967	250	0	173	187	0	
V/C Ratio(X)	0.83	0.50	0.03	0.10	0.35	0.29	0.29	0.00	0.17	0.30	0.00	
Avail Cap(c_a), veh/h	501	2752	1227	315	2167	967	428	0	350	348	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.1	0.0	0.0	7.4	8.7	8.3	37.2	0.0	36.4	39.0	0.0	0.0
Incr Delay (d2), s/veh	4.5	0.4	0.0	0.6	0.4	0.8	0.6	0.0	0.5	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.2	0.0	0.3	3.2	2.4	1.5	0.0	0.6	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	0.4	0.0	8.1	9.1	9.1	37.8	0.0	36.9	39.9	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1564			1062			102			57	A
Approach Delay, s/veh		4.5			9.1			37.5			39.9	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		75.1		14.9	14.8	60.3		14.9				
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1				
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9				
Max Q Clear Time (g_c+I1), s		2.0		7.9	10.0	11.4		5.3				
Green Ext Time (p_c), s		22.1		0.1	0.3	8.3		0.3				

Intersection Summary			
HCM 6th Ctrl Delay			8.2
HCM 6th LOS			A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	20	19	104	155	3
Future Vol, veh/h	3	20	19	104	155	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	22	21	113	168	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	325	170	171	0	-	0
Stage 1	170	-	-	-	-	-
Stage 2	155	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	669	874	1406	-	-	-
Stage 1	860	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	658	874	1406	-	-	-
Mov Cap-2 Maneuver	658	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	873	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1406	-	838	-	-
HCM Lane V/C Ratio	0.015	-	0.03	-	-
HCM Control Delay (s)	7.6	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	101	1234	5	3	857	27	5	0	11	72	0	103
Future Vol, veh/h	101	1234	5	3	857	27	5	0	11	72	0	103
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	105	1285	5	3	893	28	5	0	11	75	0	107

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	921	0	0	1290	0	0	1951	2425	645	1766	2413	461
Stage 1	-	-	-	-	-	-	1498	1498	-	913	913	-
Stage 2	-	-	-	-	-	-	453	927	-	853	1500	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	737	-	-	*897	-	-	91	35	*600	*161	36	547
Stage 1	-	-	-	-	-	-	385	373	-	*294	350	-
Stage 2	-	-	-	-	-	-	556	345	-	*565	371	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	737	-	-	*897	-	-	65	30	*600	*140	31	547
Mov Cap-2 Maneuver	-	-	-	-	-	-	65	30	-	*140	31	-
Stage 1	-	-	-	-	-	-	331	320	-	*252	349	-
Stage 2	-	-	-	-	-	-	445	344	-	*475	319	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	28.8	31.3
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	168	737	-	-	* 897	-	-	140	547
HCM Lane V/C Ratio	0.099	0.143	-	-	0.003	-	-	0.536	0.196
HCM Control Delay (s)	28.8	10.7	-	-	9	-	-	57.1	13.2
HCM Lane LOS	D	B	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.3	0.5	-	-	0	-	-	2.6	0.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	897	64	50	482	116	95	377	100	216	673	229
Future Volume (veh/h)	108	897	64	50	482	116	95	377	100	216	673	229
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	115	954	68	53	513	123	101	401	106	230	716	244
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	144	1279	570	67	1125	502	128	777	346	265	1049	468
Arrive On Green	0.08	0.37	0.37	0.04	0.32	0.32	0.07	0.22	0.22	0.15	0.30	0.30
Sat Flow, veh/h	1739	3469	1547	1739	3469	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	115	954	68	53	513	123	101	401	106	230	716	244
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1739	1735	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	5.7	21.0	2.5	2.7	10.3	5.1	5.0	8.9	5.0	11.3	15.9	11.4
Cycle Q Clear(g_c), s	5.7	21.0	2.5	2.7	10.3	5.1	5.0	8.9	5.0	11.3	15.9	11.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	144	1279	570	67	1125	502	128	777	346	265	1049	468
V/C Ratio(X)	0.80	0.75	0.12	0.79	0.46	0.25	0.79	0.52	0.31	0.87	0.68	0.52
Avail Cap(c_a), veh/h	317	1761	785	317	1761	785	317	1761	785	317	1761	785
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	24.1	18.3	41.8	23.5	21.7	40.0	29.9	28.4	36.3	26.9	25.3
Incr Delay (d2), s/veh	3.8	1.5	0.1	7.5	0.4	0.4	4.1	0.8	0.7	17.3	1.1	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	8.2	0.9	1.2	4.0	1.8	2.2	3.6	1.8	5.9	6.3	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.3	25.6	18.4	49.3	23.9	22.1	44.0	30.6	29.1	53.6	28.0	26.6
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1137			689			608			1190	
Approach Delay, s/veh		27.0			25.5			32.6			32.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	37.8	10.4	32.0	11.3	33.9	17.3	25.1
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	4.7	23.0	7.0	17.9	7.7	12.3	13.3	10.9
Green Ext Time (p_c), s	0.0	9.3	0.0	8.6	0.0	5.7	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	29.5
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	300	968	354	989	122	1375	377	1415
v/c Ratio	0.81	0.91	0.89	0.91	0.74	0.89	1.76	0.85
Control Delay	76.9	58.1	84.2	57.0	86.1	49.3	395.2	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.9	58.1	84.2	57.0	86.1	49.3	395.2	46.0
Queue Length 50th (ft)	138	440	165	447	110	407	~515	422
Queue Length 95th (ft)	190	#561	#251	#579	177	473	#719	#509
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	416	1105	416	1112	214	1592	214	1668
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.88	0.85	0.89	0.57	0.86	1.76	0.85

Intersection Summary

~ 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	7	1459	996	78	1279	38	73
v/c Ratio	0.03	0.71	0.71	0.38	0.35	0.15	0.24
Control Delay	11.4	17.2	5.0	45.2	3.5	33.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	17.2	5.0	45.2	3.5	33.2	7.6
Queue Length 50th (ft)	2	278	50	46	49	20	0
Queue Length 95th (ft)	10	#542	167	m76	106	43	28
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	230	2064	1459	300	3639	391	417
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.71	0.68	0.26	0.35	0.10	0.18

Intersection Summary

\# 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	166	1366	32	31	752	279	72	30	57	600
v/c Ratio	0.62	0.56	0.03	0.16	0.43	0.29	0.29	0.09	0.25	0.85
Control Delay	57.1	4.2	1.2	18.3	16.2	3.1	34.1	0.5	33.5	18.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.1	4.2	1.2	18.3	16.2	3.1	34.1	0.5	33.5	18.3
Queue Length 50th (ft)	103	73	0	9	128	0	37	0	29	36
Queue Length 95th (ft)	m148	96	m0	34	223	46	71	0	60	#175
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2461	1148	190	1758	949	340	419	308	763
Starvation Cap Reductn	0	130	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	0.33	0.59	0.03	0.16	0.43	0.29	0.21	0.07	0.19	0.79

Intersection Summary

\# 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	954	68	53	513	123	101	401	106	230	716	244
v/c Ratio	0.64	0.78	0.11	0.43	0.51	0.23	0.59	0.47	0.23	0.84	0.67	0.42
Control Delay	66.8	37.8	5.0	65.1	33.8	7.0	65.7	36.2	7.5	73.9	37.6	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.8	37.8	5.0	65.1	33.8	7.0	65.7	36.2	7.5	73.9	37.6	14.8
Queue Length 50th (ft)	79	305	0	37	148	0	69	127	0	162	237	47
Queue Length 95th (ft)	163	498	26	90	254	47	146	188	42	#405	351	130
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	275	1530	730	275	1530	752	275	1530	743	275	1530	771
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.62	0.09	0.19	0.34	0.16	0.37	0.26	0.14	0.84	0.47	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX E: MEMORANDUM OF UNDERSTANDING

Memorandum

Date: December 13, 2021

To: Ryan Kim and Nick Lowe, City of Carson
CC: Stefanie Edmondson, City of Carson
Darren Embry, Faring

From: Drew Heckathorn and Michael Kennedy, Fehr & Peers

Subject: 21611 South Perry Street Self-Storage/Mixed-Use Project Traffic Study Methodology and Assumptions

LB21-0049

This document summarizes the methodology and assumptions for the study to address transportation analysis requirements and potential improvements for the 21611 South Perry Street Self-Storage/Mixed-Use project in the City of Carson.

Overall Methodology

The assessment of the proposed project will involve evaluating intersection level of service (LOS) and queueing for the following scenarios during weekday AM and PM peak hour conditions:

- Existing
- Existing plus Ambient Growth with Project
- Future Base
- Future with Project

Any adverse project traffic effects will be defined by comparing Existing LOS to Existing plus Ambient Growth with Project LOS and Future Base LOS to Future with Project LOS for weekday AM and PM peak periods. Specific LOS methodology and thresholds are defined below.

LOS Methodology

All study intersections will be analyzed using the Highway Capacity Manual (HCM), 6th Edition method.

Project Traffic Threshold

Study intersections will be considered adversely affected if the project's traffic would contribute to unacceptable queuing, defined as:

- Spill over from turn pockets into through lanes
- Spill over into intersections

Existing Conditions

Existing Transportation Network

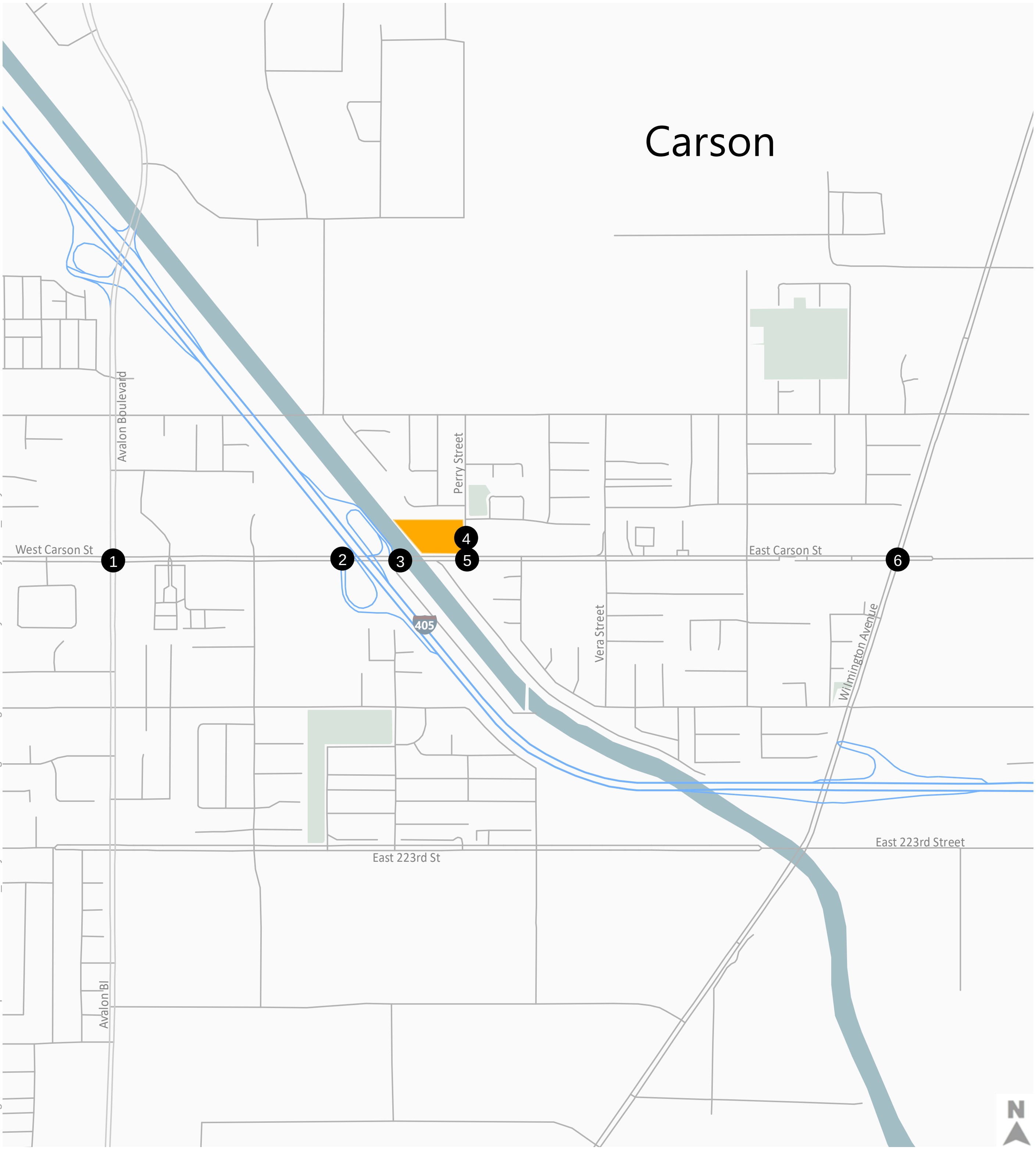
The study report will include a description of the following existing transportation network elements:

- Freeway and street characteristics within the study area
- Pedestrian infrastructure within ¼ mile of the project site
- Bicycle infrastructure within 2 miles of the project site
- Transit available within ¼ mile of the project site

Existing Traffic Volumes

Recent traffic studies in the City of Carson will be reviewed to determine if there are available turning movement count data at any of the proposed study intersections. Due to significant changes in travel behavior caused by the COVID-19 pandemic, this study will utilize AM and PM peak hour traffic counts collected in the year prior to the start of the pandemic (March 2019-March 2020). If pre-pandemic counts are not available at any location, new AM and PM peak hour traffic counts will be collected. If appropriate, an adjustment factor will be applied to the new counts to estimate pre-pandemic traffic levels. The list of study intersections is shown below and in **Figure 1**:

1. Avalon Boulevard & Carson Street
2. I-405 Southbound Ramps & Carson Street
3. I-405 Northbound Ramps & Carson Street
4. Perry Street & Proposed Project Driveway (Future Intersection)
5. Perry Street & Carson Street
6. Wilmington Avenue & Carson Street



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Study Intersections

Proposed Project Site

Figure 1

Study Intersections

Existing Plus Ambient Growth Conditions

Existing plus Ambient Growth volumes will account for ambient growth in the study area up to the project buildout year. Specific assumptions are listed below:

- Project Buildout Year – 2023
- Ambient linear growth factor – 0.5% per year (for a total of 2% over 4 years)

Future Base Conditions

The Future Base volumes will account for the Existing plus Ambient Growth volumes and trips associated with known related projects and any planned network changes. Related projects are shown in **Table 1** and **Figure 2** (list of projects provided by the City of Carson).

Project Description

The project as analyzed will include:

- Self-Storage Warehouse 109,039 square feet (725 storage units)
    - Self-Storage Office 2,425 square feet
- Retail Space 700 square feet
- Restaurant Space 1,550 square feet

Project Trip Generation

The total trip generation for the project is based on ITE rates with credits for internal capture and pass-by informed by NCHRP internal capture guidelines and ITE data for pass-by credits. Trip generation rates and credits are shown in **Table 2**.

Trip Distribution

The geographic trip distribution of the project trips is based on several factors including the type and density of the proposed land uses, the geographic distribution of population and activity centers in the surrounding area, and the location of the project access points in relation to the surrounding street and freeway system.

Figure 3 illustrates the trip distribution pattern of the project trips.

Other Traffic and Parking Study Components

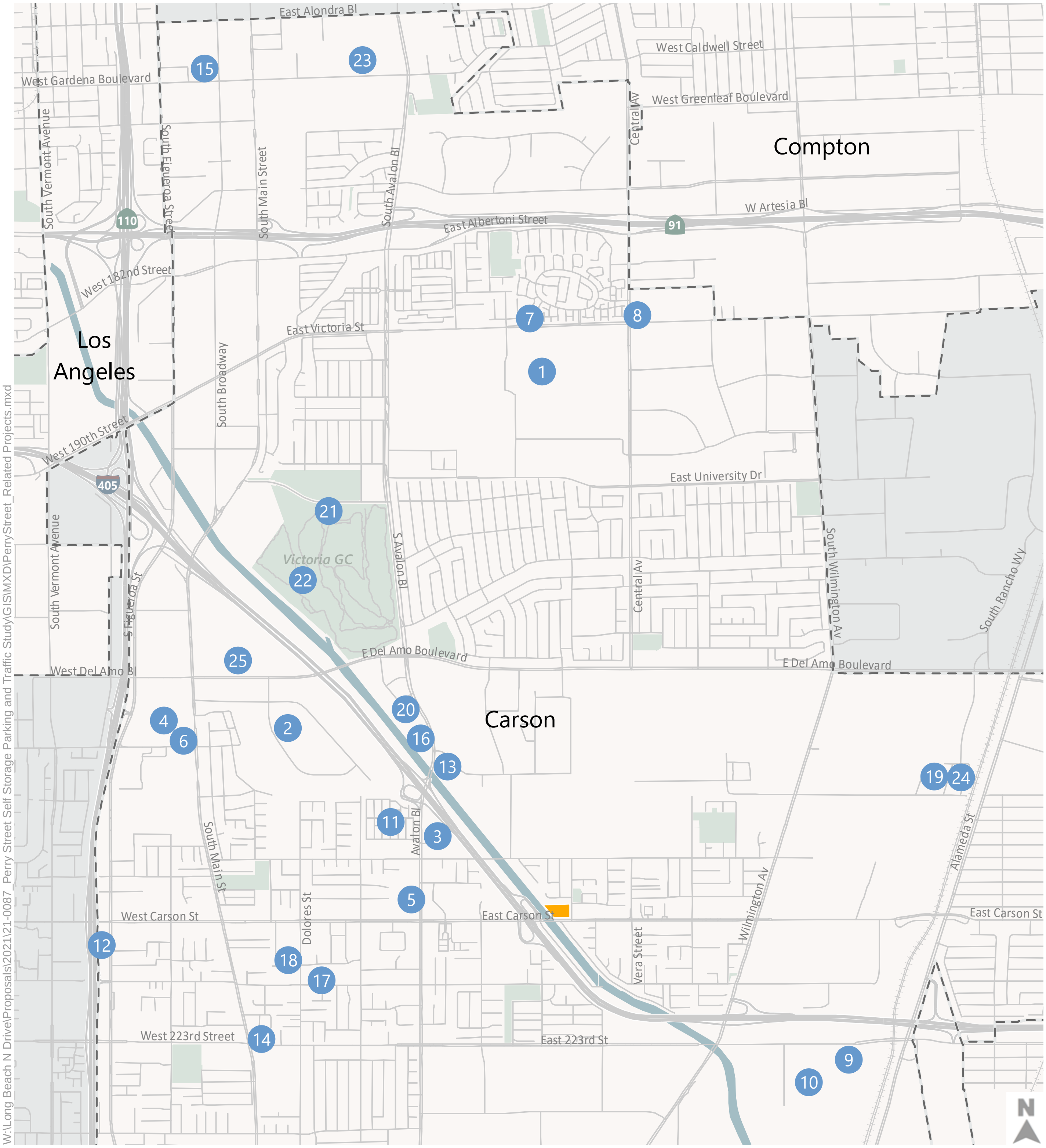
Site Access Analysis

This analysis will involve a review of the project's proposed access including an analysis of driveways and pedestrian entry points.

TABLE 1
PERRY STREET SELF STORAGE PROJECT
RELATED PROJECTS

No.	Project Location	Land Use	Size		Trip Generation						
					Daily	AM			PM		
						IN	OUT	TOTAL	IN	OUT	TOTAL
1	CSUDH Master Plan	Mixed Use	[1]	[1]	N/A	2,299	1,415	3,714	1,940	2,286	4,226
2	The District at South Bay	Mixed Use	[1]	[1]	42,791	1,490	1,349	2,838	1,809	1,997	3,805
3	21212 Avalon Blvd	Mixed Use	[1]	[1]	9,779	171	347	518	391	268	659
4	20601 S Main St	Industrial Park	267	ksf	900	87	20	107	22	85	107
5	Union South Bay (21521 S Avalon Blvd)	Multifamily	357	du	3,685	54	156	210	199	137	335
		Shopping	31	ksf							
6	225 W Torrance Blvd	Multifamily	356	du	1,937	33	95	128	96	61	157
7	1007 E Victoria St	Multifamily	35	du	278	4	13	17	13	8	21
8	NEC Victoria and Central	Multifamily	175	du	1,281	19	62	81	62	36	98
9	2254 E 223rd St	Warehousing	121	ksf	429	29	8	36	10	29	39
10	2112 E 223rd St	Warehousing	292	ksf	507	38	12	50	14	41	55
11	21207 Avalon Blvd	Mixed Use	[1]	[1]	5,586	125	277	402	283	174	457
12	21809-21811 S Figueroa St	Multifamily	32	du	234	3	11	14	11	7	18
13	888 E Dominguez St	Hotel	118	keys	905	32	22	54	36	35	71
14	123 E 223rd st	Multifamily	10	du	36	2	1	3	1	2	3
15	333 W Gardena Blvd	Warehousing	146	ksf	276	19	6	25	7	21	28
16	20707 Avalon Blvd	Retail	3	ksf	608	26	26	52	22	20	42
17	345/349 E 220th St	Multifamily	35	du	256	4	12	16	12	7	19
18	21915 S Dolores St	Multifamily	5	du	37	1	2	3	2	2	4
19	2315 E Dominguez St	Warehousing	14	ksf	68	1	1	2	1	2	3
20	20501 Avalon Blvd	Retail	5	ksf	1,013	44	43	86	37	34	70
21	Carol Kimmelman Campus	Mixed Use	[1]	[1]	3,808	105	83	188	244	192	436
22	Creek Dominguez Hills	Mixed Use	[1]	[1]	16,132	580	384	964	727	669	1,396
23	439 E Gardena Blvd	Warehousing	4	ksf	52	1	0	1	0	1	1
24	20950 Brant Ave	Retail	4	ksf	151	2	2	4	7	8	15
25	20330 S Main St	Multifamily	300	du	1,580	27	109	136	84	45	129
				Total	92,329	5,196	4,456	9,649	6,030	6,167	12,194

Notes:
du = dwelling unit
ksf = one thousand square feet
[1] Mixed Use developments contain more than one independent variable to calculate trip generation.
Related projects list is based on information provided by the City of Carson, the County of Los Angeles, publicly available environmental documentation, and trip generation rates contained in ITE Trip Generation, 10th Edition.



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Proposed Project Site

Cities

Related Projects

Figure 2

Related Projects

TABLE 2
PERRY STREET SELF-STORAGE PROJECT
ESTIMATED PROJECT TRIP GENERATION

Land Use	ITE Land Use Code	Size	Trip Generation Rates [a]							Estimated Trip Generation						
				AM Peak Hour			PM Peak Hour				AM Peak Hour Trips			PM Peak Hour Trips		
			Daily	Rate	In%	Out%	Rate	In%	Out%	Daily	In	Out	Total	In	Out	Total
PROPOSED PROJECT																
Mini-Warehouse	151	7 Units (100s)	17.96	1.21	51%	49%	1.68	50%	50%	130	5	4	9	6	6	12
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [b]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net External Vehicle Trips										130	5	4	9	6	6	12
Coffee/Donut Shop without Drive-Through Window [c]	936	1.55 KSF	450.49	93.08	51%	49%	32.29	50%	50%	698	73	71	144	25	25	50
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [b]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Driveway Trips										698	73	71	144	25	25	50
Less: Pass-by			*43%*	*43%*			*43%*			*(300)*	*(31)*	*(31)*	*(62)*	*(11)*	*(11)*	*(22)*
Net External Vehicle Trips										398	42	40	82	14	14	28
Copy, Print, and Express Ship Store [d]	920	0.7 KSF	74.2	2.78	75%	25%	7.42	44%	56%	52	2	0	2	2	3	5
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [b]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Driveway Trips										52	2	0	2	2	3	5
Less: Pass-by			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net External Vehicle Trips										52	2	0	2	2	3	5
TOTAL DRIVEWAY TRIPS										880	80	75	155	33	34	67
TOTAL PROJECT EXTERNAL VEHICLE TRIPS										580	49	44	93	22	23	45
EXISTING USE CREDIT																
Vacant Lot	-		-	-	-	-	-	-	-	0	0	0	0	0	0	0
TOTAL EXISTING DRIVEWAY TRIPS										0	0	0	0	0	0	0
NET INCREMENTAL EXTERNAL TRIPS										580	49	44	93	22	23	45

Notes:
[a] Source: Institute of Transportation Engineers (ITE), *Trip Generation, 11th Edition*, 2021
[b] A 0% Walk/Bike/Transit Credit was used based on the site's general suburban context.
[c] ITE use 933 - Fast-Food Restaurant without Drive-Through Window used for daily rate due to lack of daily rate data for ITE use 936 - Coffee/Donut Shop without Drive-Through Window.
[d] ITE use 920 does not have a daily rate. The daily rate is estimated to be 10 times greater than the PM peak hour traffic volume for the use.

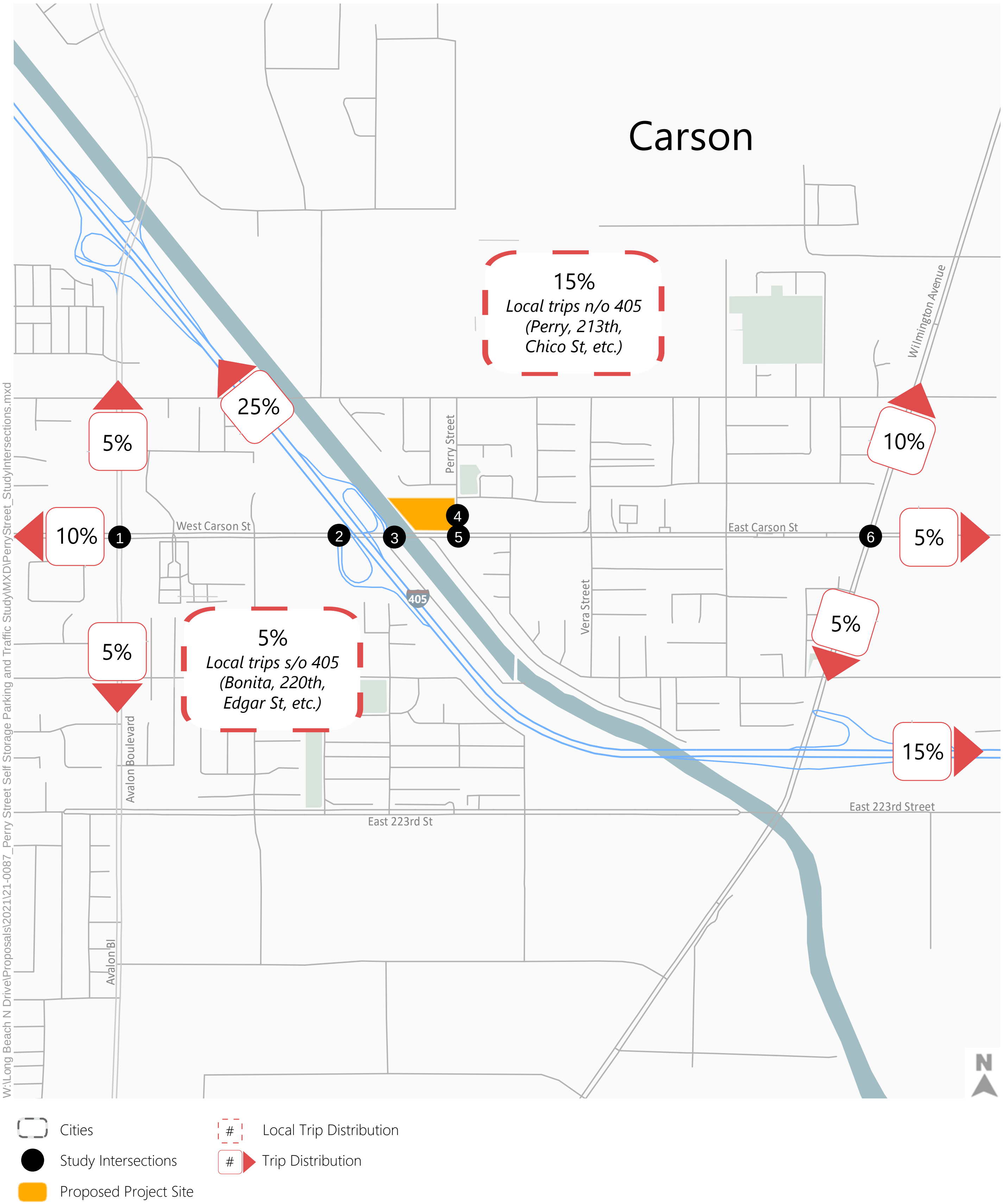


Figure 3

Trip Distribution

Parking Demand Analysis

This analysis will assess if the proposed on-site parking supply is adequate to accommodate peak parking demand. In addition to estimating peak parking demand, the analysis will consider potential spillover effects into adjacent residential neighborhoods, shared parking efficiencies, and TDM strategies.

The parking demand analysis will include a summary of minimum parking requirements for the project based on the Carson Municipal Code. The analysis will then consider national best practice standards, such as the ITE *Parking Generation* manual and ULI *Shared Parking* manual, to see if lower parking ratios can be justified given the project's land use types and local context. The ULI *Shared Parking* methodology will also be utilized to determine shared parking efficiencies through complementary on-site land uses (i.e., land uses with peak parking demand occurring at different times of day or season).

Potential Improvements

Any adverse effects of project traffic on the study intersections will be identified. If the project traffic creates adverse effects (according to the City of Carson guidelines described in the Project Traffic Threshold section of this memorandum), physical and/or operational improvements necessary to accommodate project trips will be investigated and defined at a conceptual level.

VMT Analysis

The proposed project can be classified as local-serving retail, and therefore based on standard OPR guidance can screen out from conducting VMT analysis for CEQA purposes. As described in the OPR technical advisory: "By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT." This approach will be described qualitatively in any environmental documents necessary for the project.

APPENDIX B

21611 South Perry Street

Local Transportation Assessment

Prepared for:
21611 Perry Street, LLC

January 18, 2022

LB21-0049.00

FEHR PEERS

Table of Contents

Appendices

1. Introduction

This report documents the assumptions, methodologies, and findings of a traffic and parking study conducted by Fehr & Peers to address non-CEQA related transportation needs and potential improvements for the 21611 South Perry Street self-storage/mixed-use project (the "Project") in the City of Carson, California, on a 2.8-acre site located east of the I-405 Freeway interchange with Carson Street.

1.1 Project Description

The Project is proposed to be developed in the City of Carson in the South Bay area of Los Angeles County on a currently vacant lot. It is located approximately 17.5 miles south of downtown Los Angeles and approximately 8.5 miles east of the Pacific Ocean. The Project site is comprised of approximately 2.8 acres located to the east of the I-405 Freeway interchange with Carson Street. The Project site is bounded by a single-family residential neighborhood to the north, a mix of residential and commercial uses to the east, a truck dealership to the south, and the Dominguez Channel to the west. **Figure 1** illustrates the Project site and study area. **Figure 2** includes the site plan.

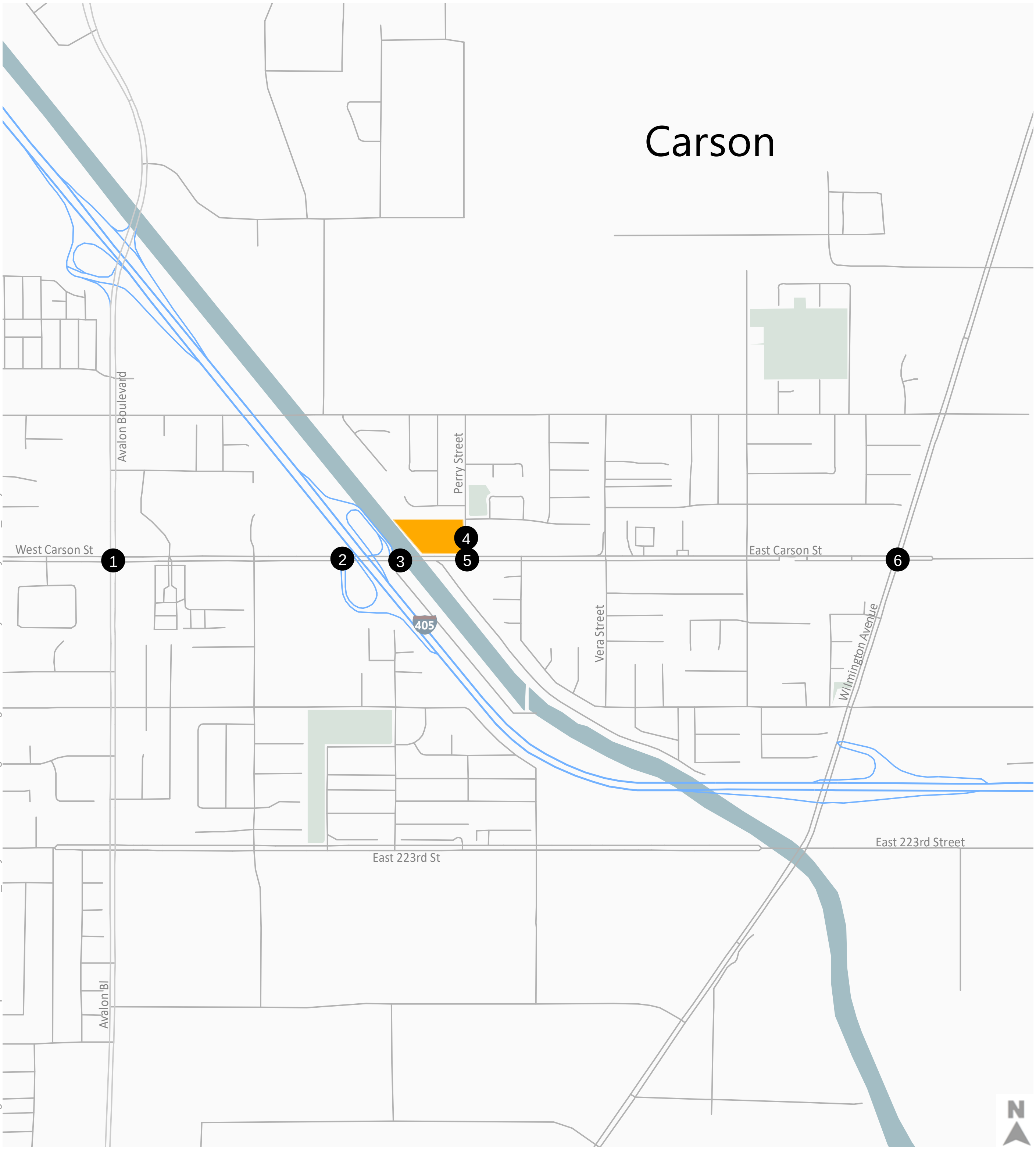
The Project as analyzed in this study involves the construction of:

- 109,039 square feet (725 storage units) of self-storage warehouse space
- 2,425 square feet of self-storage office space
- 700 square feet of retail space
- 1,550 square feet of restaurant space

The Project, as illustrated in the site plan in **Figure 2**, will have side-street stop control access and egress at one driveway location. This Project driveway will provide access to and from Perry Street.

1.2 Study Scope

The scope of work for this study was determined in conjunction with the City of Carson's Transportation staff. The base assumptions and technical methodologies were discussed with the City of Carson as part of the study approach and agreed to in a memorandum of understanding, dated December 13, 2021. This memorandum is included in **Appendix E** of this document.



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Cities
Study Intersections
Proposed Project Site

Figure 1

Project Location and Study Intersections

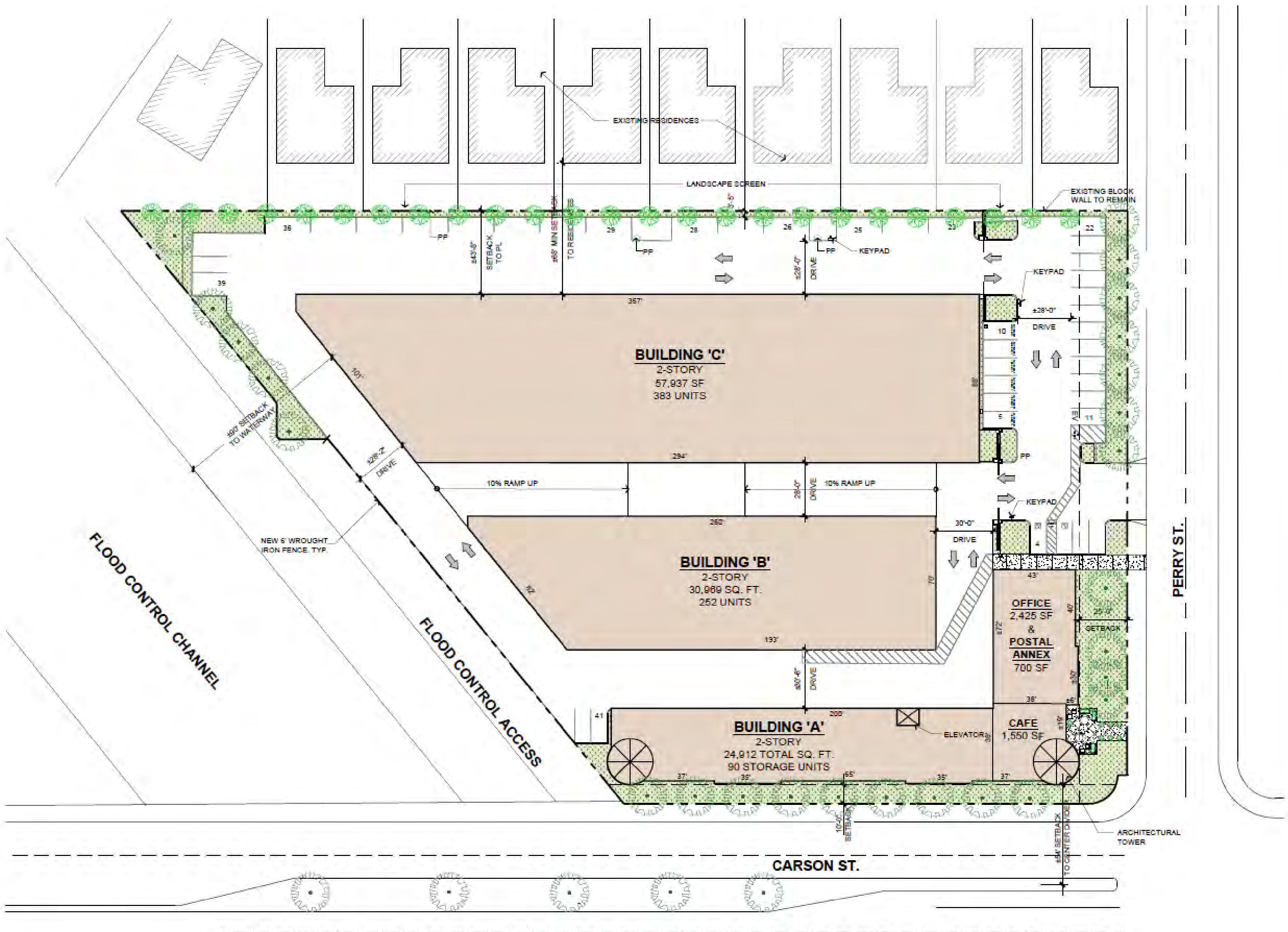


Image Source: Jordan Architects

Figure 2

Site Plan

1.3 Traffic Scenarios

The study assumes that the Project will be completed by year 2023. This study analyzes the potential project-generated traffic effects to the local street system under both existing and future year traffic conditions. The following traffic scenarios have been developed and analyzed as part of this study:

- Existing Conditions – The existing conditions analysis includes a description of the transportation system serving the Project site, existing traffic volumes, and an assessment of the operating conditions at the study analysis locations described below. This scenario is described in detail in **Chapter 2**.
- Existing plus Ambient Growth plus Project Conditions – This traffic scenario provides projected traffic volumes and an assessment of operations under existing conditions with the addition of project-generated traffic and ambient regional growth by the year 2023. The effects of the proposed Project on existing traffic operating conditions were then identified. This scenario is described in detail in **Chapter 3**.
- Future Base (Year 2023) Conditions – Future traffic projections without the proposed Project were developed for the year 2023. The objective of this analysis was to project future traffic growth and operating conditions that could be expected to result from ambient regional growth and related projects in the vicinity of the Project site by the year 2023. This scenario is described in detail in **Chapter 3**.
- Future (Year 2023) plus Project Conditions – This traffic scenario provides projected traffic volumes and an assessment of operating conditions under future conditions with the addition of Project-generated traffic. The effects of the proposed Project on future traffic operating conditions were then identified. This scenario is described in **Chapter 3**.

1.4 Study Intersections

A total of 6 intersections were selected for the analysis of the Project in consultation with the City of Carson. Of the 6 intersections, 4 are signalized intersections and 2 are unsignalized intersections.

1.4.1 Signalized Intersections

The following signalized intersections, illustrated in **Figure 1**, were identified in conjunction with the City of Carson to be analyzed as part of the scope of work for this Project:

1. Avalon Boulevard & Carson Street
2. I-405 Southbound Ramps & Carson Street
3. I-405 Northbound Ramps/Recreation Road & Carson Street
6. Wilmington Avenue & Carson Street

1.4.2 Unsignalized Intersections

The following two unsignalized intersections, illustrated in **Figure 1**, were identified in conjunction with the City of Carson:

4. Perry Street & Project Driveway
5. Perry Street & Carson Street

1.5 Organization of Report

This report is divided into 6 chapters, including this introduction. **Chapter 2** describes the existing conditions including an inventory of the streets, highways, and transit service in the study area, a summary of existing traffic volumes, and an assessment of existing operating conditions. The methodologies used to develop traffic forecasts for the Existing, Existing plus Ambient Growth plus Project, Future Base, and Future plus Project scenarios and the forecasts themselves are included in **Chapter 3**. **Chapter 4** presents an assessment of intersection traffic conditions with the addition of Project trips. **Chapter 5** provides an assessment of the proposed Project's parking and access scheme. **Chapter 6** provides a summary and conclusions.

2. Existing Conditions

A comprehensive data collection effort was conducted to develop a detailed description of existing conditions in the study area. The assessment of conditions includes a description of the study area, an inventory of the local street system, a review of traffic volume on these facilities, an assessment of the resulting operating conditions, and the current transit service in the study area. This chapter presents a detailed description of these elements.

2.1 Study Area

The Project site is located within the City of Carson. The study area selected for analysis is bounded by the State Route 91 freeway to the north, the Harbor Freeway (I-110) to the west, State Route 47 to the east, and 223rd Street to the south. The streets in the study area are under the jurisdiction of the City of Carson, except for all freeway ramp terminal intersections which are controlled by Caltrans.

2.2 Existing Street System

As illustrated in **Figure 1**, the Project site is located just east of the I-405 Freeway interchange with Carson Street. The site is currently a vacant lot. I-405 provides the primary regional access to the Project site.

Major arterials serving the study area include Carson Street in the east/west direction and Avalon Boulevard and Wilmington Avenue in the north/south direction.

The characteristics of the freeways and major roadways serving the study area are described below.

2.2.1 Freeways

- **Interstate 405** runs in a northwest/southeast direction in the study area, extending from I-5 in the City of Irvine to the San Fernando Valley in the City of Los Angeles. In the study area, the freeway provides four lanes and one carpool lane in each direction plus auxiliary lanes. Ramps are provided at Carson Street.

2.2.2 East/West Streets

- **Carson Street** is classified as a Major Highway in the City of Carson's General Plan, Transportation and Infrastructure Element and runs in the east/west direction south of the Project site with two lanes in each direction through most of the study area. Parking is generally permitted on both sides of the street and left-turn pockets are present at major intersections. Carson Street from Figueroa Street to the I-405 interchange was recently improved as part of the Carson Street Mixed-Use District Master Plan, adding pedestrian enhancements including curb bulbouts and high-visibility crosswalks.

2.2.3 North/South Streets

- **Avalon Boulevard** is classified as a Major Highway and runs in the north/south direction west of the Project site with three travel lanes in each direction north of Carson Street and two travel lanes in each direction south of Carson Street. Parking is permitted on the blocks south of Carson Street but not on the blocks north of Carson Street. Left-turn pockets are present at major intersections.
- **Wilmington Avenue** is classified as a Major Highway and runs in the north/south direction east of the Project site with generally two travel lanes in each direction. Parking is generally permitted on both sides of the street and left-turn pockets are present at major intersections.

Lane configurations of the study intersections are provided in **Appendix A**.

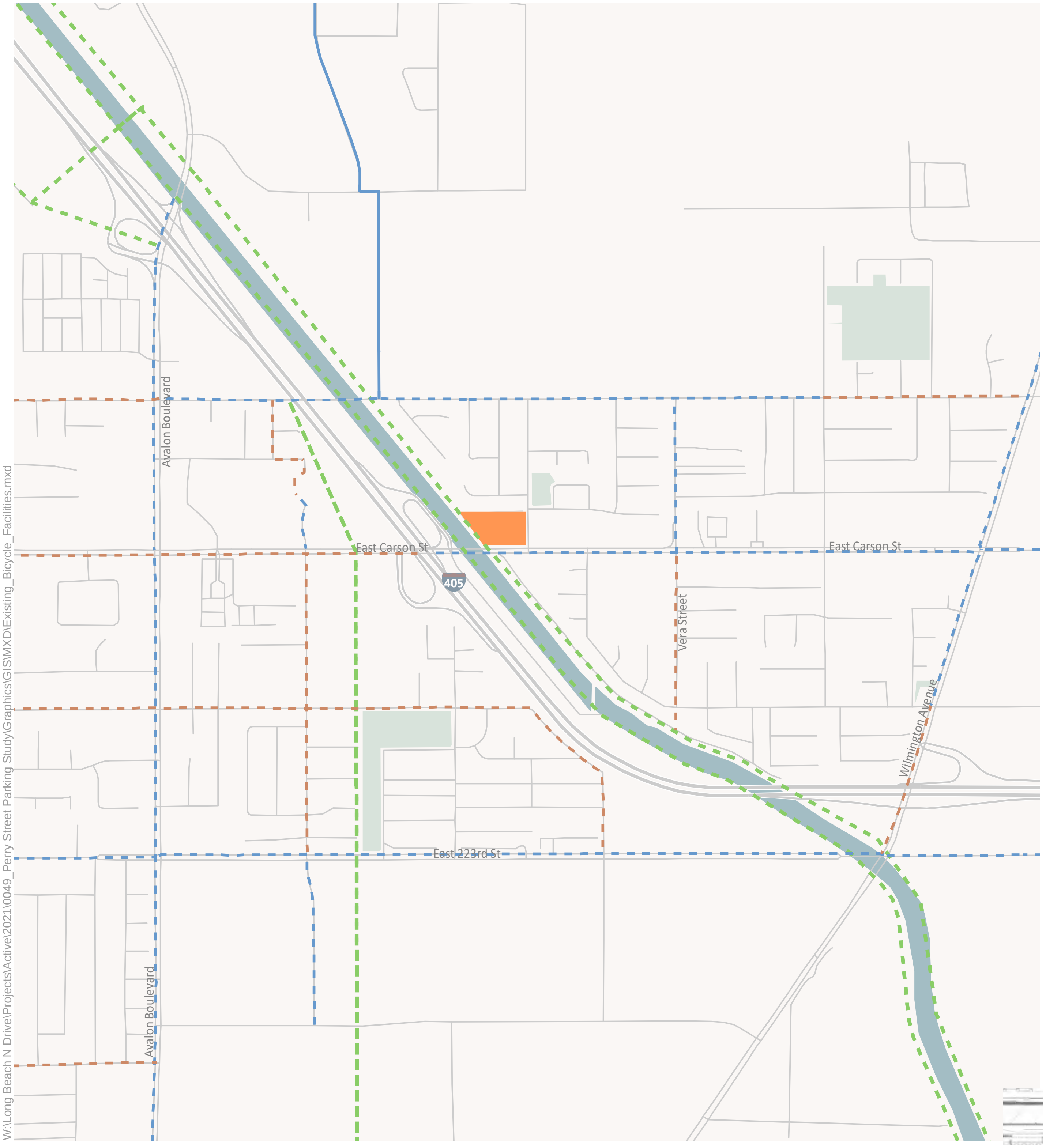
2.3 Existing Public Transit Service

The Project site is served by one public transit route, Long Beach Transit Route 4, which provides service to the LA Metro J Line bus rapid transit at Carson Station and the LA Metro A Line light rail at Del Amo Station. Route 4 provides service every 40 minutes on weekdays and Saturdays.

2.4 Existing Bicycle and Pedestrian Facilities

Figure 3 shows existing bicycle facilities in the study area. As shown in the figure, the study area has a limited existing bikeway network. Carson Street is now designated as a Class III bike route west of I-405 as part of the recent street improvements. The study area generally has a network of 4- to 8-foot-wide sidewalks but does not have crosswalks on all intersection legs and countdown pedestrian signals at all marked crossings.

There are several bike lanes and bike routes planned throughout the study area as well as a planned extension of the bike path along the Dominguez Channel, east of I-405. Proposed bicycle facilities are also shown in **Figure 4**. Data on the proposed facilities come from two sources: the City of Carson Master Plan of Bikeways and Metro's Active Transportation Strategic Plan.



Proposed Project Site
Existing Class I (Bike Path)
Existing Class II (Bike Lane)
Existing Class III (Bike Route)
Proposed Class I (Bike Path)
Proposed Class II (Bike Lane)
Proposed Class III (Bike Route)

Figure 3

Existing and Proposed Bicycle Facilities

2.5 Existing Traffic Volumes and Level of Service

This section presents existing peak hour traffic volumes, describes the methodology used to assess traffic conditions at each intersection, and analyzes the resulting operating conditions at each location, indicating average vehicle delay and levels of service (LOS).

2.5.1 Existing Traffic Volumes

Due to significant changes in travel behavior caused by the COVID-19 pandemic, this study utilized AM and PM peak hour traffic counts collected in the year prior to the start of the pandemic (March 2019-March 2020). Since pre-pandemic traffic counts were not available for Intersection 5 – Perry Street & Carson Street, new traffic counts were collected at this location on Thursday, December 9, 2021. Adjustment factors were then applied to the new traffic counts to estimate pre-pandemic traffic levels. These adjustment factors were derived by comparing the pre-pandemic counts at nearby intersections with the new counts. Specifically, traffic heading towards the I-405 Freeway in the AM peak hour was increased by approximately 30% and traffic heading away from the I-405 Freeway in the PM peak hour was increased by approximately 20%. The existing weekday morning and evening peak hour volumes at the study intersections, and the adjustment factor volumes, are provided in **Appendix A**. Signal timing plans for the signalized study intersections are provided in **Appendix B**. Traffic count worksheets for the study intersections are contained in **Appendix C**.

2.5.2 Level of Service Methodology

Per the City of Carson guidelines, study intersections are analyzed using the Highway Capacity Manual (HCM), 6th Edition method. The HCM method estimates the average vehicle delay at each intersection based on key parameters including traffic volume, signal timing, and roadway geometry. The overall intersection delay per vehicle is subsequently assigned a LOS value to describe intersection operations, as shown in **Table 1**. LOS ranges from LOS A (free flow) to LOS F (gridlock condition).

The two unsignalized study intersections (Intersections 4 and 5) are both side-street stop-controlled, and the LOS for these intersections is based on the worst operating stop-controlled approach.[1] **Table 1** also shows the LOS values assigned based on stop-controlled approach delay per vehicle for unsignalized intersections using the HCM method.

2.5.3 Existing 2019 Levels of Service

Existing year traffic volumes, presented in **Appendix A**, were analyzed using the methodologies described above to determine the existing operating conditions at the study intersections. **Table 2** summarizes the resulting seconds of delay per vehicle and the corresponding LOS at each of the analyzed intersections.

[1] The analysis for Intersection 5 includes southern approach volumes for reference. The southern approach is the private driveway for a truck dealer facility. Since the southern approach is a private driveway with low traffic volumes in all scenarios, the LOS reported for this intersection is based on the delay for the northern approach.

All existing study intersections operate at LOS D or better during both peak periods. Detailed LOS analysis sheets for the Project are provided in **Appendix D**.

Table 1: HCM Level of Service Definitions

LOS	Description for Signalized Intersections	Signalized Delay (Seconds)	Unsignalized Delay (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10.0	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0	> 10.0 to 15.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0	> 15.0 to 25.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0	> 25.0 to 35.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0	> 35.0 to 50.0
F	Operations with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0	> 50.0

Source: *Highway Capacity Manual, 6th Edition* (Transportation Research Board, 2016).

Table 2: Existing Levels of Service

Study Intersection	Control Type	Period	Delay (s)	LOS
1. Avalon Boulevard & Carson Street	Signalized	AM	39.9	D
		PM	51.2	D
2. I-405 SB Ramps & Carson Street	Signalized	AM	9.4	A
		PM	10.2	B
3. I-405 NB Ramps & Carson Street	Signalized	AM	7.5	A
		PM	8.1	A
4. Perry Street & Project Driveway	TWSC [1]	AM	Project Only Scenarios	
		PM		
5. Perry Street & Carson Street	TWSC	AM	18.3	C
		PM	19.0	C
6. Wilmington Avenue & Carson Street	Signalized	AM	28.2	C
		PM	26.0	C

[1] TWSC = Two-Way Stop-Controlled
Source: Fehr & Peers.

3. Traffic Projections

3.1 Project Traffic

The development of trip generation estimates for the proposed Project involves the use of a 3-step process: trip generation, trip distribution, and traffic assignment.

3.1.1 Project Trip Generation

As indicated in Chapter 1, the proposed Project uses include 109,039 square feet (or 725 storage units) of self-storage warehouse space, 2,425 square feet of self-storage office space, 700 square feet of retail space, and 1,550 square feet of restaurant space.

Trip generation rates from *Trip Generation, 11th Edition* (Institute of Transportation Engineers [ITE], 2021) were used to estimate the number of trips associated with the Project and are presented in **Table 3**. As described below, reductions were applied to the standard ITE rates to account for pass-by trips. The standard ITE rates reflect land uses within a suburban, auto-oriented environment. To be conservative, this analysis does not include trip reductions for walking, biking and transit use beyond the levels found in a typical suburban environment.

Pass-by credits account for patrons making an intermediate stop on the way from an origin to a primary trip destination without a route diversion. A typical pass-by trip is a retail destination that people may visit on the way home from work. These trips would be attracted from traffic passing the site on nearby streets. The City of Carson does not have standard pass-by credit guidelines. Instead, pass-by credits were informed by the ITE *Trip Generation Handbook*.

As shown in **Table 3**, the Project will generate an estimate net increase of 580 daily trips, including 93 trips (49 inbound/44 outbound) during the AM peak hour and 45 trips (22 inbound/23 outbound) during the PM peak hour.

3.1.2 Project Traffic Distribution

The geographic distribution of traffic generated by the proposed Project depends on several factors. These include the type and density of the proposed land uses, the geographic distribution of population and employment centers from the patrons and employees of the Project may be drawn, and the location of the Project's driveway access in relation to the surrounding street system. Considering these factors, trip distribution patterns were developed according to the nature of the land uses and the corresponding percentage of traffic likely to use the freeway versus the local street system to access the Project site. **Figure 4** illustrates the distribution pattern for the Project.

TABLE 3
PERRY STREET SELF-STORAGE PROJECT
ESTIMATED PROJECT TRIP GENERATION

Land Use	ITE Land Use Code	Size	Trip Generation Rates [a]							Estimated Trip Generation						
				AM Peak Hour			PM Peak Hour				AM Peak Hour Trips			PM Peak Hour Trips		
			Daily	Rate	In%	Out%	Rate	In%	Out%	Daily	In	Out	Total	In	Out	Total
PROPOSED PROJECT																
Mini-Warehouse	151	7.25 Units (100s) [b]	17.96	1.21	51%	49%	1.68	50%	50%	130	5	4	9	6	6	12
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [c]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net External Vehicle Trips										130	5	4	9	6	6	12
Coffee/Donut Shop without Drive-Through Window [d]	936	1.55 KSF	450.49	93.08	51%	49%	32.29	50%	50%	698	73	71	144	25	25	50
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [c]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Driveway Trips										698	73	71	144	25	25	50
Less: Pass-by			*43%*	*43%*			*43%*			*(300)*	*(31)*	*(31)*	*(62)*	*(11)*	*(11)*	*(22)*
Net External Vehicle Trips										398	42	40	82	14	14	28
Copy, Print, and Express Ship Store [e]	920	0.7 KSF	74.2	2.78	75%	25%	7.42	44%	56%	52	2	0	2	2	3	5
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [c]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Driveway Trips										52	2	0	2	2	3	5
Less: Pass-by			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net External Vehicle Trips										52	2	0	2	2	3	5
TOTAL DRIVEWAY TRIPS										880	80	75	155	33	34	67
TOTAL PROJECT EXTERNAL VEHICLE TRIPS										580	49	44	93	22	23	45
EXISTING USE CREDIT																
Vacant Lot	-		-	-	-	-	-	-	-	0	0	0	0	0	0	0
TOTAL EXISTING DRIVEWAY TRIPS										0	0	0	0	0	0	0
NET INCREMENTAL EXTERNAL TRIPS										580	49	44	93	22	23	45

Notes:

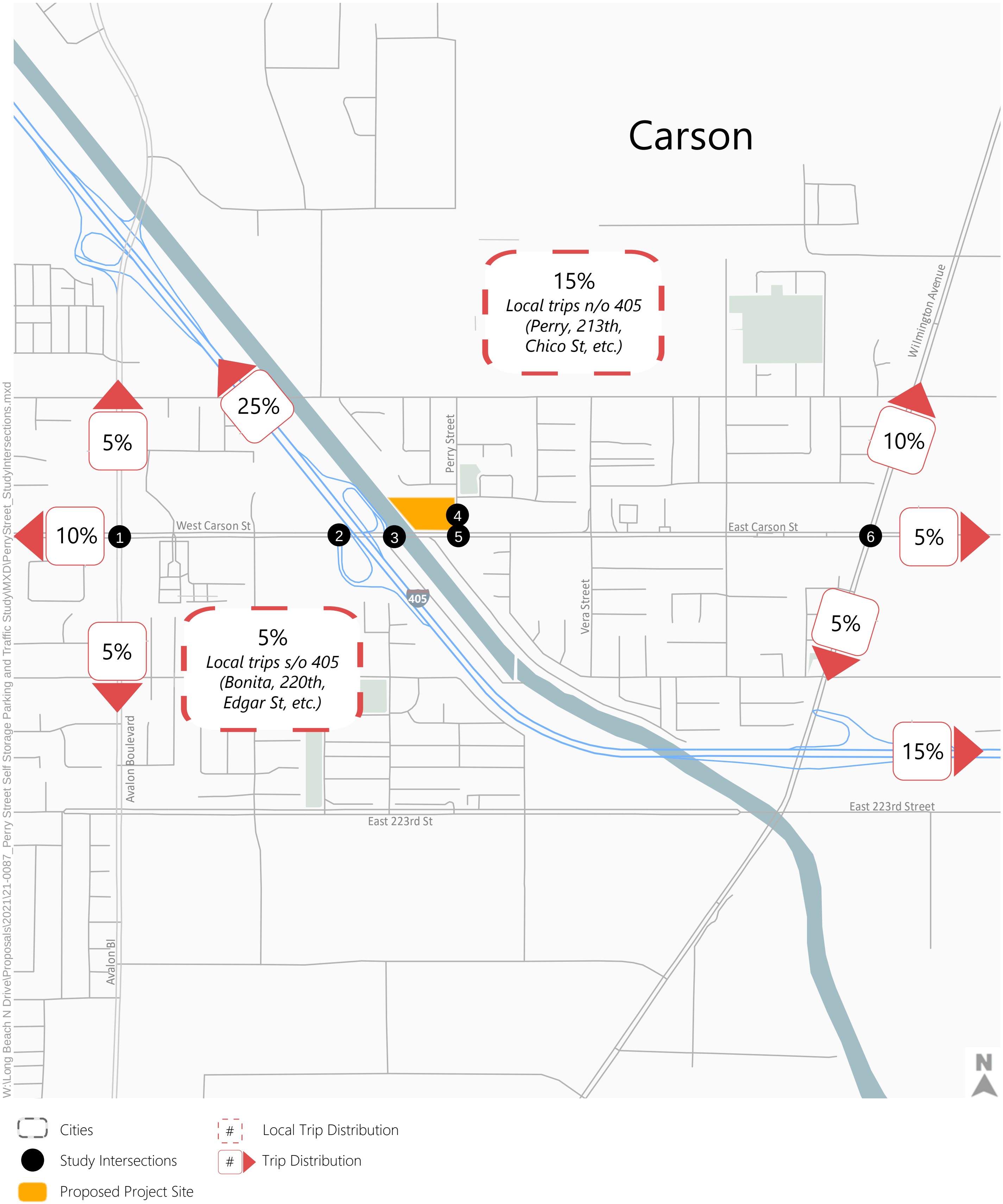
[a] Source: Institute of Transportation Engineers (ITE), *Trip Generation, 11th Edition* , 2021

[b] The independent variable used to estimate trip generation for the self-storage use is total number of storage units. Trip generation for the self-storage office space is considered to be inclusive, per the ITE approach.

[c] A 0% Walk/Bike/Transit Credit was used based on the site's general suburban context.

[d] ITE use 933 - Fast-Food Restaurant without Drive-Through Window used for daily rate due to lack of daily rate data for ITE use 936 - Coffee/Donut Shop without Drive-Through Window.

[e] ITE use 920 does not have a daily rate. The daily rate is estimated to be 10 times greater than the PM peak hour traffic volume for the use.



W:\Long Beach N Drive\Proposals\2021\21-0087_Perry Street Self Storage Parking and Traffic Study\MXD\PerryStreet_StudyIntersections.mxd

Figure 4

Project Trip Distribution

3.1.3 Project Traffic Assignment

The traffic expected to be generated by the proposed Project was assigned to the street network using the distribution patterns illustrated in **Figure 4**. **Appendix A** shows the assignment of Project-only traffic volumes for the morning and evening peak hours at the 6 analyzed intersection locations.

3.2 Existing Plus Ambient Growth Plus Project Traffic Conditions

Based on historic trends and at the direction of the City of Carson, it was established that an ambient growth factor of 0.5% per year should be applied to adjust the existing base year traffic volumes to reflect the effects of regional growth and development by year 2023. This growth factor was applied to the 2019 traffic volume data to reflect the effect of ambient growth by the year 2023.

The Project traffic estimated and assigned to the study intersections was added to the existing traffic volumes along with the regional ambient traffic growth to estimate Existing plus Ambient Growth plus Project traffic volumes. Turning movement traffic volumes for the Existing plus Ambient Growth plus Project scenario are provided in **Appendix A**. Analysis sheets are provided in **Appendix D**.

3.3 Future Year 2023 Traffic Conditions

To evaluate the potential effects of the proposed Project on future (Year 2023) conditions, it was necessary to develop estimates of future traffic conditions in the area both with and without Project traffic. First, estimates of traffic growth were developed for the study area to forecast future conditions without the Project. These forecasts included traffic increases due to both regional ambient traffic growth and traffic generated by specific developments in the vicinity of the Project (related projects). Including both ambient growth and trips from specific projects proposed within the vicinity of the Project provides a conservative estimate of future traffic projections.

These projected traffic volumes, identified herein as the Future Base conditions, represent the future conditions without the proposed Project.

3.3.1 Related Project Traffic Generation and Assignment

Future Base traffic forecasts include the effects of known specific projects, called related projects, expected to be implemented in the vicinity of the proposed Project. A list of related projects was prepared based on data from the City of Carson. A total of 25 related projects were identified in the study area; these projects are listed in **Table 4** and illustrated in **Figure 5**.

3.3.1.1 Trip Generation

Trip generation estimates for the related projects were calculated using a combination of previous study findings, publicly available environmental documentation, and trip generation rates contained in *Trip*

Generation, 10th Edition.[2] **Table 4** presents the resulting trip generation estimates for these related projects. These trip generation projections are conservative in that they do not in every case account for either the existing uses to be removed or the possible use of walking, biking and transit. Traffic mitigation measures associated with the related projects are not considered in order to conduct a more conservative analysis.

3.3.1.2 Trip Distribution

The geographic distribution of the traffic generated by the related projects is dependent on several factors. These factors include the type and density of the proposed land uses, the geographic distribution of population from which employees and potential patrons of proposed commercial developments may be drawn, the locations of employment and commercial centers to which residents of residential projects may be drawn, and the location of the projects in relation to the surrounding street system. Additionally, if the traffic study or environmental document for a related project was available, the trip distribution from that study was considered.

Using the estimated trip generation and trip distribution patterns described above, traffic generated by the related projects was assigned to the street network.

3.3.2 Future Year 2023 Base Traffic Volumes

Future (Year 2023) Base weekday AM and PM peak hour traffic volumes and lane geometries for the analyzed intersections are provided in **Appendix A**. The Future Base traffic conditions represent an estimate of future conditions without the proposed Project inclusive of the regional ambient growth and related projects traffic.

3.4 Future Plus Project Traffic Projections

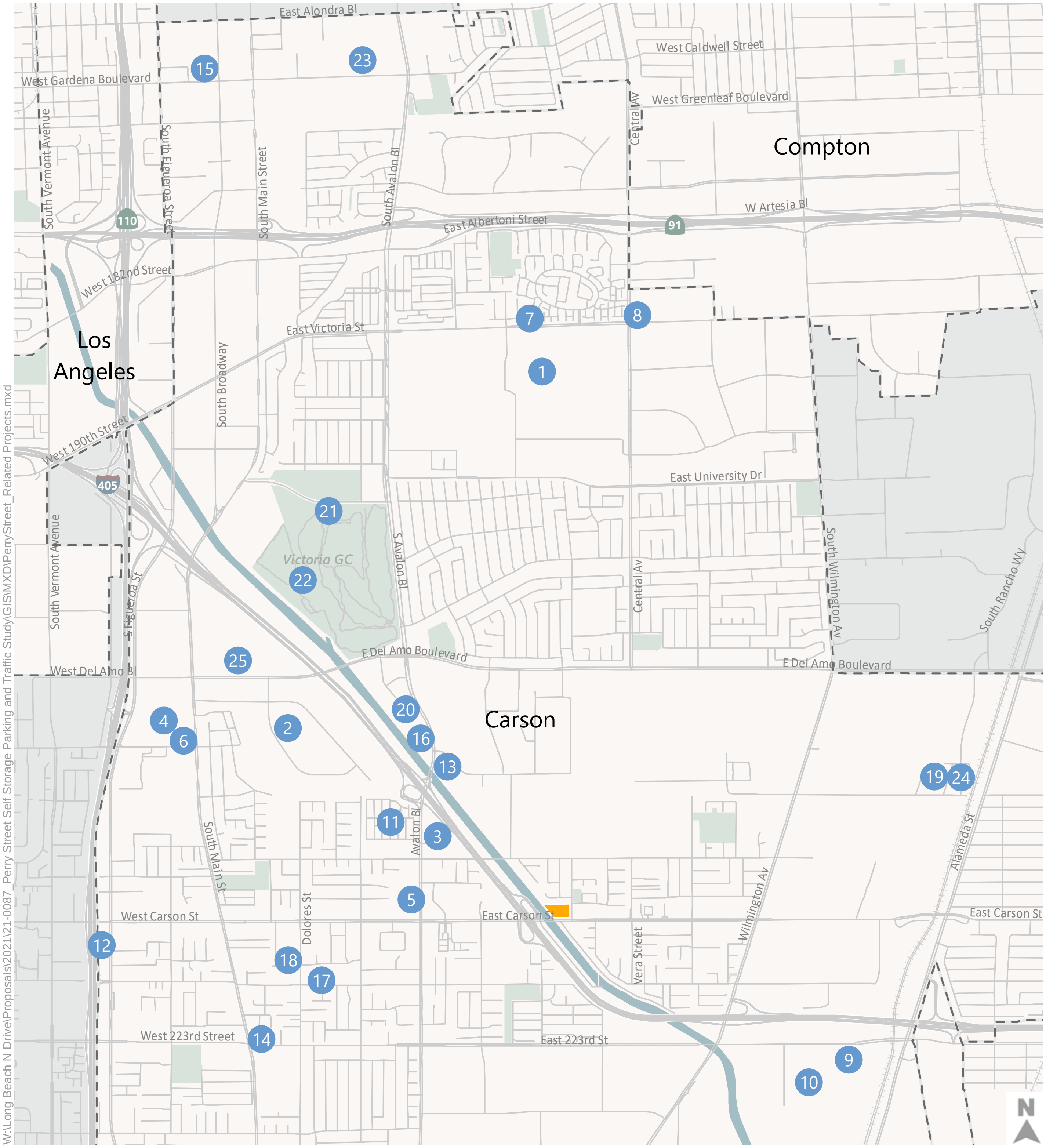
The proposed Project traffic volumes were added to the Future (Year 2023) Base traffic projections, resulting in Future (Year 2023) plus Project AM and PM peak hour traffic volumes. The Future (Year 2023) plus Project scenario represents future traffic conditions with the completion of the proposed Project. **Appendix A** shows the lane configurations and volumes analyzed as part of the Future plus Project scenario.

[2] Trip generation estimates for related projects, along with previous study findings and publicly available environmental documentation, were conducted prior to the issuance of *Trip Generation, 11th Edition.*

TABLE 4
PERRY STREET SELF STORAGE PROJECT
RELATED PROJECTS

No.	Project Location	Land Use	Size		Trip Generation						
					Daily	AM			PM		
						IN	OUT	TOTAL	IN	OUT	TOTAL
1	CSUDH Master Plan	Mixed Use	[1]	[1]	N/A	2,299	1,415	3,714	1,940	2,286	4,226
2	The District at South Bay	Mixed Use	[1]	[1]	42,791	1,490	1,349	2,838	1,809	1,997	3,805
3	21212 Avalon Blvd	Mixed Use	[1]	[1]	9,779	171	347	518	391	268	659
4	20601 S Main St	Industrial Park	267	ksf	900	87	20	107	22	85	107
5	Union South Bay (21521 S Avalon Blvd)	Multifamily	357	du	3,685	54	156	210	199	137	335
		Shopping	31	ksf							
6	225 W Torrance Blvd	Multifamily	356	du	1,937	33	95	128	96	61	157
7	1007 E Victoria St	Multifamily	35	du	278	4	13	17	13	8	21
8	NEC Victoria and Central	Multifamily	175	du	1,281	19	62	81	62	36	98
9	2254 E 223rd St	Warehousing	121	ksf	429	29	8	36	10	29	39
10	2112 E 223rd St	Warehousing	292	ksf	507	38	12	50	14	41	55
11	21207 Avalon Blvd	Mixed Use	[1]	[1]	5,586	125	277	402	283	174	457
12	21809-21811 S Figueroa St	Multifamily	32	du	234	3	11	14	11	7	18
13	888 E Dominguez St	Hotel	118	keys	905	32	22	54	36	35	71
14	123 E 223rd st	Multifamily	10	du	36	2	1	3	1	2	3
15	333 W Gardena Blvd	Warehousing	146	ksf	276	19	6	25	7	21	28
16	20707 Avalon Blvd	Retail	3	ksf	608	26	26	52	22	20	42
17	345/349 E 220th St	Multifamily	35	du	256	4	12	16	12	7	19
18	21915 S Dolores St	Multifamily	5	du	37	1	2	3	2	2	4
19	2315 E Dominguez St	Warehousing	14	ksf	68	1	1	2	1	2	3
20	20501 Avalon Blvd	Retail	5	ksf	1,013	44	43	86	37	34	70
21	Carol Kimmelman Campus	Mixed Use	[1]	[1]	3,808	105	83	188	244	192	436
22	Creek Dominguez Hills	Mixed Use	[1]	[1]	16,132	580	384	964	727	669	1,396
23	439 E Gardena Blvd	Warehousing	4	ksf	52	1	0	1	0	1	1
24	20950 Brant Ave	Retail	4	ksf	151	2	2	4	7	8	15
25	20330 S Main St	Multifamily	300	du	1,580	27	109	136	84	45	129
				Total	92,329	5,196	4,456	9,649	6,030	6,167	12,194

Notes:
du = dwelling unit
ksf = one thousand square feet
[1] Mixed Use developments contain more than one independent variable to calculate trip generation.
Related projects list is based on information provided by the City of Carson, the County of Los Angeles, publicly available environmental documentation, and trip generation rates contained in ITE Trip Generation, 10th Edition.



Proposed Project Site

Cities

Related Projects

Figure 5

Related Projects

4. Intersection Traffic Analysis

The intersection traffic analysis evaluates the projected LOS at each study intersection under the Existing plus Ambient Growth plus Project and Future (Year 2023) plus Project conditions to estimate the incremental increase in seconds of delay per vehicle expected to be caused by the proposed Project.

4.1 Existing Plus Ambient Growth Plus Project Analysis

4.1.1 Existing Plus Ambient Growth Plus Project Traffic Level of Service

The Existing plus Ambient Growth plus Project traffic volumes presented in **Appendix A** were analyzed to determine the projected delay per vehicle and LOS for each of the study intersections. **Table 5** summarizes the Existing plus Ambient Growth plus Project LOS. Analysis sheets are provided in **Appendix D**. As shown in **Table 5**, all study intersections are projected to operate at LOS D or better during both morning and evening peak hours under Existing plus Ambient Growth plus Project conditions.

4.2 Future Plus Project Analysis

4.2.1 Future Base Traffic Level of Service

The Future (Year 2023) Base peak hour traffic volumes were analyzed to determine the projected seconds of delay per vehicle and LOS for each of the study intersections. **Table 6** summarizes the future LOS at each intersection. Five of the 6 study intersections are projected to operate at LOS D or better during the morning and evening peak hours under Future Base conditions.

The following study intersection is projected to operate at LOS E under Future Base conditions:

1. Avalon Boulevard & Carson Street (AM & PM Peak Hours)

Detailed LOS analysis sheets for the Future Base scenario are provided in **Appendix D**.

4.2.2 Future Plus Project Traffic Level of Service

The Future (Year 2023) plus Project peak hour traffic volumes, provided in **Appendix A**, were analyzed to determine the projected future operating conditions with the addition of the proposed Project traffic. The results of the Future (Year 2023) plus Project analysis are also presented in **Table 6**, with analysis sheets provided in **Appendix D**. Five of the 6 study intersections are projected to operate at LOS D or better during the morning and evening peak hours under Future plus Project conditions.

The following study intersection is projected to operate at LOS E under Future plus Project conditions:

1. Avalon Boulevard & Carson Street (AM & PM Peak Hours)

Table 5: Existing Plus Ambient Growth Plus Project Levels of Service

Study Intersection	Period	Existing		Existing + Ambient + Project	
		Delay (s)	LOS	Delay (s)	LOS
1. Avalon Boulevard & Carson Street	AM	39.9	D	42.3	D
	PM	51.2	D	53.6	D
2. I-405 SB Ramps & Carson Street	AM	9.4	A	9.9	A
	PM	10.2	B	10.7	B
3. I-405 NB Ramps & Carson Street	AM	7.5	A	7.7	A
	PM	8.1	A	8.2	A
4. Perry Street & Project Driveway	AM	Project Only Scenario		9.5	A
	PM			9.4	A
5. Perry Street & Carson Street	AM	18.3	C	24.5	C
	PM	19.0	C	19.6	C
6. Wilmington Avenue & Carson Street	AM	28.2	C	29.5	C
	PM	26.0	C	26.8	C

Source: Fehr & Peers.

Table 6: Future Base and Future Plus Project Levels of Service

Study Intersection	Period	Future Base		Future + Project	
		Delay (s)	LOS	Delay (s)	LOS
1. Avalon Boulevard & Carson Street	AM	**59.1**	**E**	**59.8**	**E**
	PM	**79.0**	**E**	**79.4**	**E**
2. I-405 SB Ramps & Carson Street	AM	9.5	A	9.9	A
	PM	11.3	B	11.4	B
3. I-405 NB Ramps & Carson Street	AM	7.7	A	7.9	A
	PM	8.1	A	8.2	A
4. Perry Street & Project Driveway	AM	Project Only Scenario		9.5	A
	PM			9.4	A
5. Perry Street & Carson Street	AM	21.8	C	31.6	D
	PM	27.2	D	31.3	D
6. Wilmington Avenue & Carson Street	AM	29.8	C	30.2	C
	PM	29.4	C	29.5	C

Source: Fehr & Peers.

5. Site Access Analysis

5.1 Project Driveway

The Project will provide direct access to and from Perry Street from a new driveway between 216th Street and Carson Street. The project driveway approach will be stop-controlled. This driveway is included in the LOS analysis portion of this study as Intersection 4. **Figure 2** shows the site plan and Project driveway access.

5.2 Queuing Analysis

A queueing analysis was performed for all study intersections and all traffic volume scenarios to determine if the addition of Project traffic causes potential safety issues related to spill over queues. Study intersections are considered adversely affected if the Project's traffic contributes to unacceptable queuing, defined as:

- Spill over from turn pockets into through lanes
- Spill over into intersections

This analysis utilized the *HCM, 6th Edition* methodology to calculate the 95th percentile queue lengths for each left-turn pocket of each study intersection. Additionally, the 95th percentile queue length for the northbound left-turn movement into the Project site from Perry Street was measured. **Table 7** presents a summary of the left-turn pocket queuing analysis for Existing, Existing plus Ambient Growth plus Project, Future (Year 2023) Base, and Future (Year 2023) plus Project scenarios. As shown in **Table 7**, although several queues exceed the turn pocket storage length, these issues occur even without the addition of Project trips. Also, Project traffic is never estimated to add more than one vehicle to any queue length. These findings suggest that the addition of Project traffic will not cause any new potential safety issues related to spill over queuing. Detailed analysis sheets for each study intersection are provided in **Appendix D**.

Table 7: Study Intersection Left-Turn Pocket Queuing

Study Intersection	Direction	Storage Length (ft)	Period	Existing	Existing Ambient Project	Future Base	Future Project	Unacceptable?
1. Avalon Boulevard & Carson Street	SBL	145	AM	200	200	500	500	NO
			PM	375	400	725	725	NO
	WBL	210	AM	250	275	275	275	NO
			PM	250	275	250	275	NO
	NBL	140	AM	150	150	150	150	NO
			PM	150	150	200	200	NO
	EBL	225	AM	125	125	150	150	NO
			PM	125	125	200	200	NO
2. I-405 SB Ramps & Carson Street	WBL	55	AM	100	100	75	100	NO
			PM	75	100	75	100	NO
	EBL	45	AM	25	25	25	25	NO
			PM	25	25	25	25	NO
	Off-Ramp	1,130	AM	75	75	75	75	NO
			PM	25	50	50	50	NO
3. I-405 NB Ramps & Carson Street	WBL	100	AM	25	25	25	25	NO
			PM	50	50	50	50	NO
	EBL	70	AM	125	150	150	150	NO
			PM	175	175	150	150	NO
	Off-Ramp	1,220	AM	50	50	50	50	NO
			PM	75	75	75	75	NO
4. Perry Street & Project Driveway	NBL	150	AM	Project Only Scenario	25	Project Only Scenario	25	NO
			PM		0		0	NO
5. Perry Street & Carson Street	WBL	75	AM	0	0	0	0	NO
			PM	0	0	0	0	NO
	EBL	100	AM	25	25	25	25	NO
			PM	25	25	25	25	NO
6. Wilmington Avenue & Carson Street	SBL	210	AM	200	200	225	225	NO
			PM	400	425	425	425	NO
	WBL	195	AM	125	125	125	125	NO
			PM	100	100	100	100	NO
	NBL	295	AM	100	125	125	125	NO
			PM	150	150	150	150	NO
	EBL	195	AM	250	275	275	300	NO
			PM	175	175	175	175	NO

Source: Fehr & Peers.

5.3 Parking Demand Analysis

The Project site plans to provide 41 total parking spaces to serve the on-site uses. Of the 41 total parking spaces, 19 are designated for the self-storage use and are located within a controlled-access gated area. Only customers and employees of the self-storage facility will have access to these spaces. The remaining 22 spaces are available to serve all on-site users, including customers and employees of the retail and restaurant uses and prospective customers for the self-storage use.

5.3.1 Municipal Code Required Parking

The Carson Municipal Code includes minimum off-street parking ratios as a general requirement for new developments within the City[3]. **Table 8** shows the code parking requirements for the proposed Project land uses. As shown in the table, if the code were applied, the parking requirement would be 65 – or 24 more spaces than proposed. Therefore, the proposed parking supply would not meet the minimum code requirement for off-street parking.

Table 8: Carson Municipal Code Parking Requirements

Land Use	Parking Ratio	Size	Parking Spaces
Self-Storage	1 space per 20 units of storage area	725 units	36
	1 space per 300 SF of office area	2,425 SF	8
Restaurant	1 space per 100 SF	1,550 SF	16
Retail	1 space per 300 SF (Minimum of 5 spaces)	700 SF	5
		Total	**65**

Source: City of Carson, Fehr & Peers.

5.3.2 ITE Parking Generation Rates

The Institute of Transportation Engineers (ITE) maintains an informational report, *Parking Generation*, based on parking demand studies submitted to ITE by public agencies; consulting firms (including Fehr & Peers); universities and colleges; developers; associations; and local sections, districts, and student chapters of ITE. The data in the report is periodically updated, and is currently in its fifth edition, published in 2019[4]. Included in this report is empirically collected hourly parking demand count data from a variety of uses in the U.S. and Canada.

Based on the compiled parking data, peak period parking demand can be estimated at similar facilities using independent variables specified in the ITE report and either fitted curve or average demand rates. To evaluate the number of spaces needed at the proposed Project, this analysis uses the gross floor area

[3] *Carson Municipal Code, Section 9162.21,* City of Carson, 2022
[4] *Parking Generation, Fifth Edition,* Institute of Transportation Engineers, Washington D.C., 2019

from the proposed Project site and the demand rates from the ITE report to estimate peak period parking demand.

Table 9 provides a summary of estimated peak parking demand using the data from the ITE report. As shown in **Table 9**, the estimated peak parking demand for the proposed project using the ITE method is 29 spaces. This finding suggests that the 41 parking spaces proposed for the project will be more than adequate to accommodate peak parking demand for the Project.

Table 9: Peak Parking Demand Estimate – ITE Method

ITE Land Use Code	Equation [2]	Project Size	Project Demand
151 – Mini-Warehouse [1]	P = 0.1x	111,464 SF	11
936 – Coffee/Donut Shop without Drive-Through Window	P = 10.49x	1,550 SF	16
920 – Copy, Print, and Express Ship Store	P = 3.01x	700 SF	2
		Total	**29**

[1] The ITE report specifies Mini-Warehouse to be "typically referred to as 'self-storage' facilities."
[2] P = Parked Vehicles, x = 1,000 square feet increments of gross floor area.
Source: Fehr & Peers.

6. Summary and Conclusions

The following summarizes the results of the Project's traffic and parking study analysis:

- The Project consists of the proposed construction of 109,039 square feet (or 725 storage units) of self-storage warehouse space, 2,425 square feet of self-storage office space, 700 square feet of retail space, and 1,550 square feet of restaurant space.

- The site on which the Project will be developed is comprised of approximately 2.8 acres located to the east of the I-405 Freeway interchange with Carson Street. The Project proposes to provide side-street stop-controlled vehicular ingress and egress at one location: along Perry Street midblock between Carson Street and 216th Street.

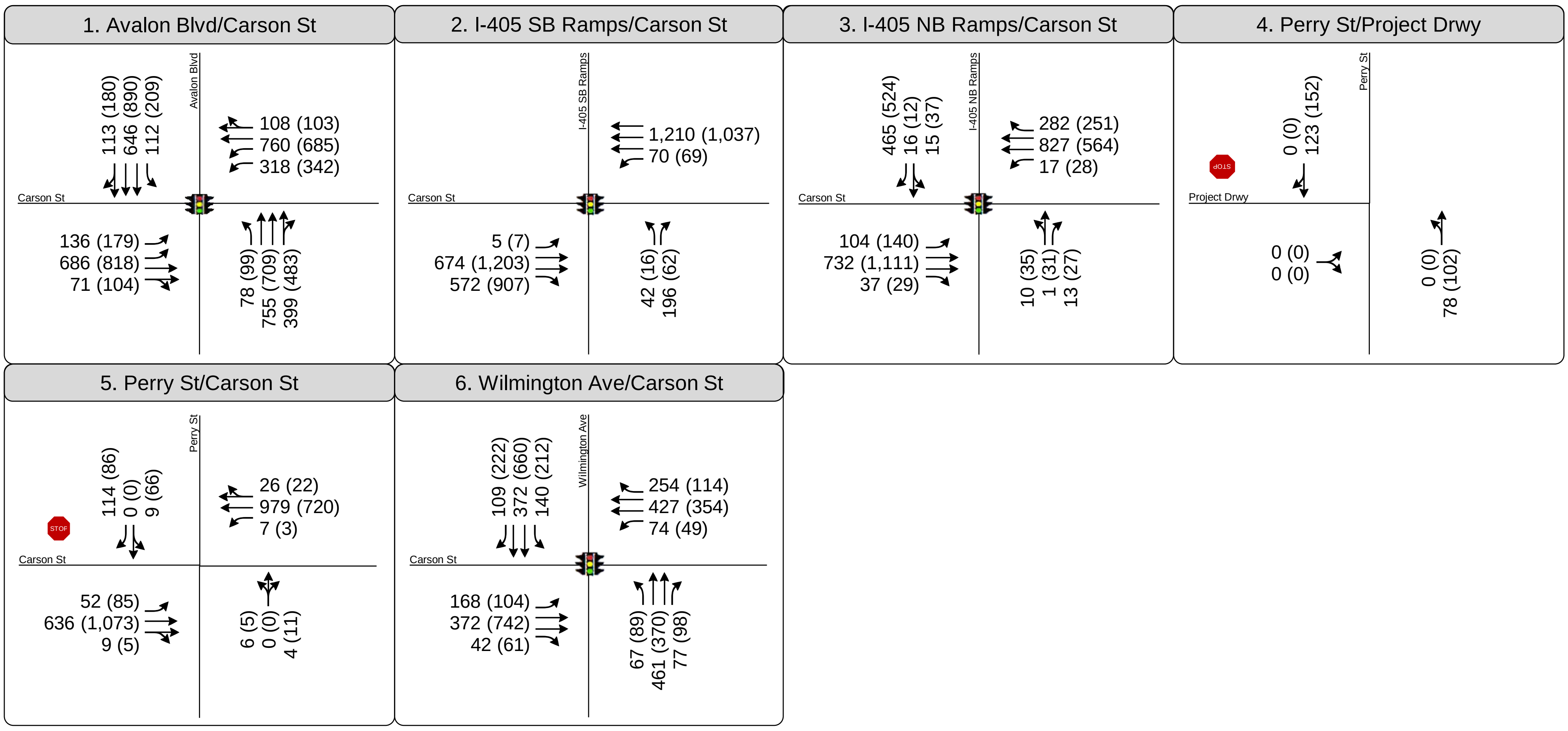
- The Project is expected to generate approximately 580 net new daily trips, 93 net new trips during the AM peak hour, and 45 net new trips during the PM peak hour.

- The addition of Project trips does not cause average vehicle delay at any study intersection to worsen from LOS D or better to LOS E or F.

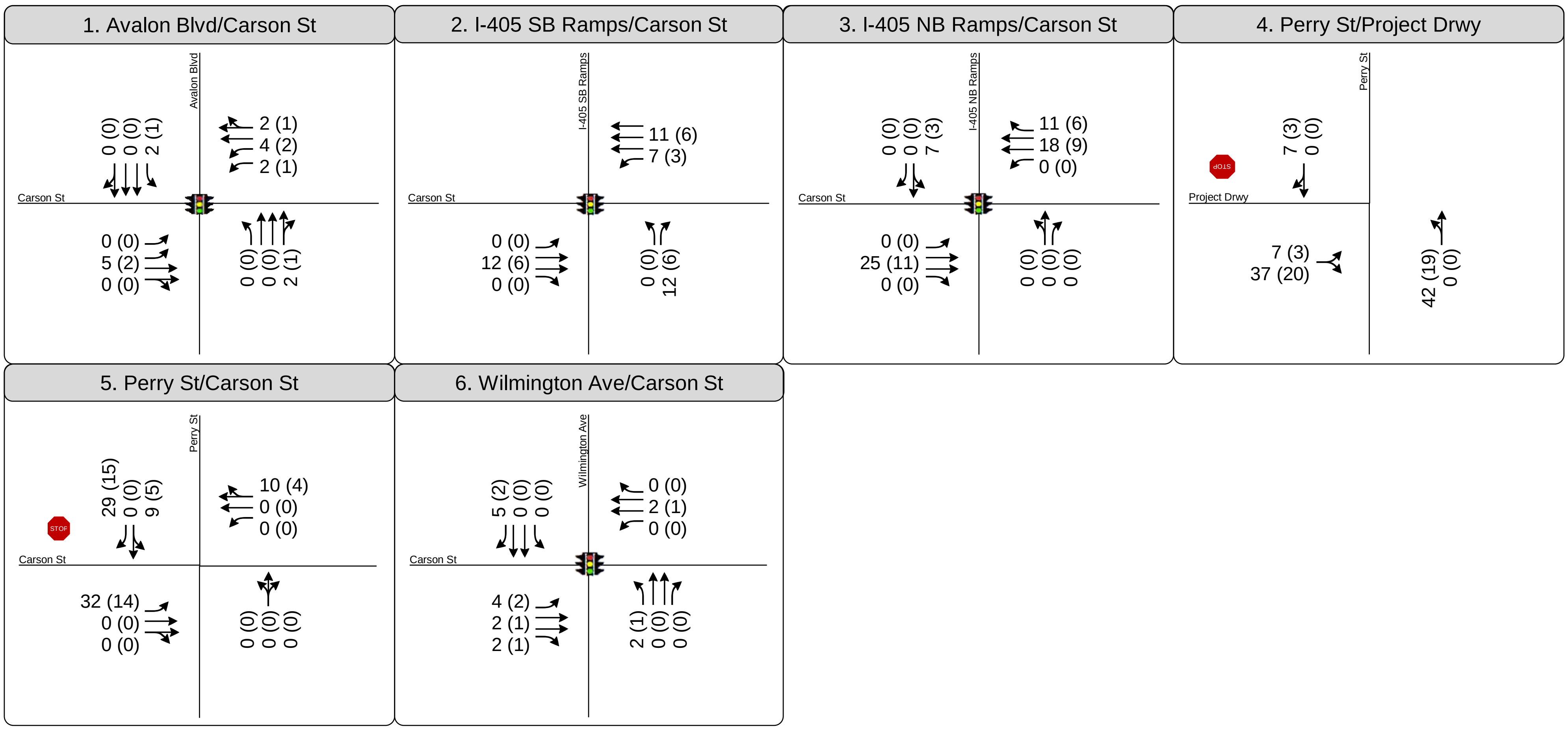
- The addition of Project trips does not cause spill over queuing at any study intersection. At intersections already experiencing spill over queueing without Project trips, the addition of Project trips increases the queue by no more than one vehicle at any study intersection approach.

- Using the ITE method for estimating parking demand, the proposed on-site parking supply of 41 spaces is more than adequate to accommodate the estimated peak parking demand of 29 spaces.

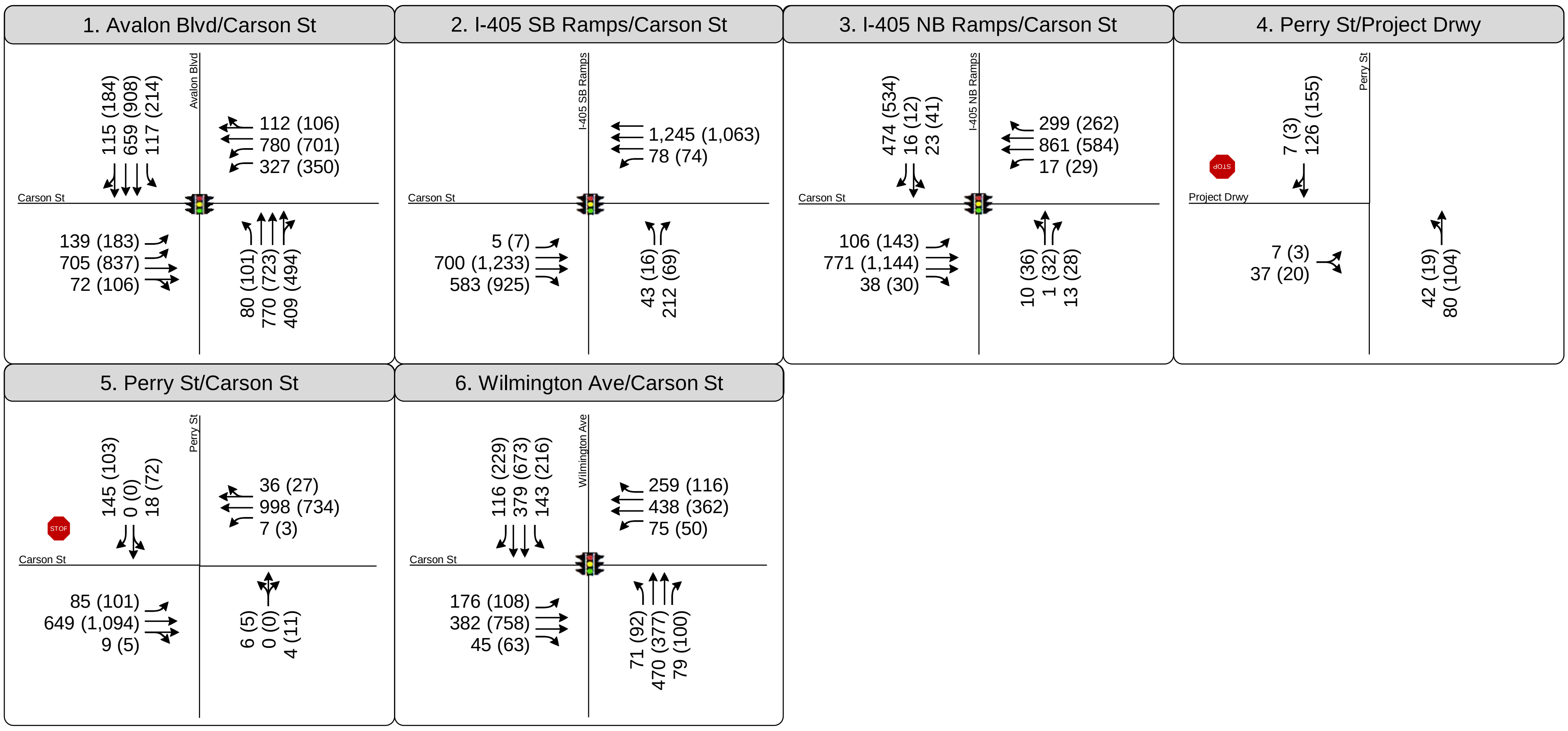
APPENDIX A:
LANE CONFIGURATIONS AND
TRAFFIC VOLUMES



Traffic Volumes and Lane Configurations
Existing Conditions - AM (PM) Peak Hour

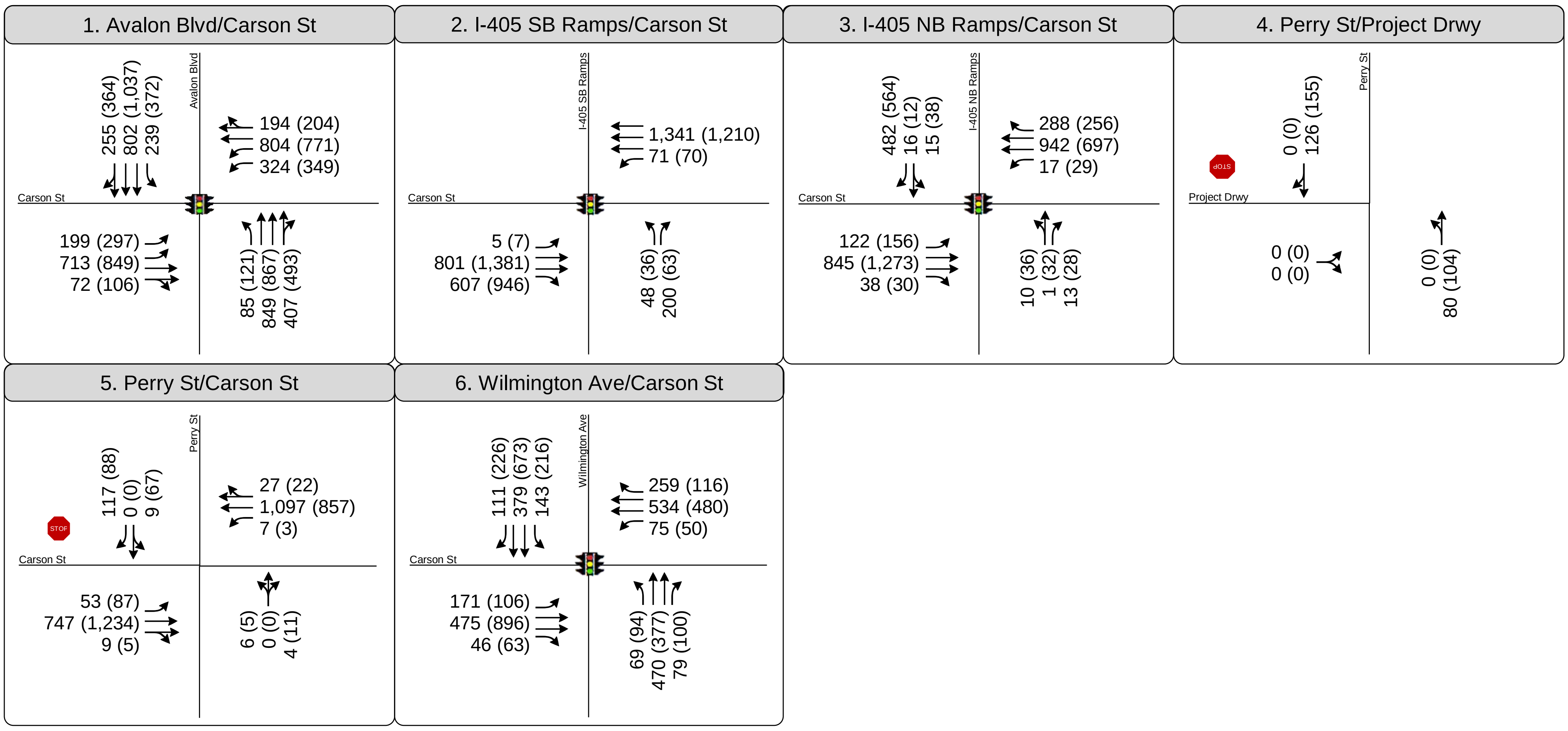


Traffic Volumes and Lane Configurations
Project Only Trips - AM (PM) Peak Hour

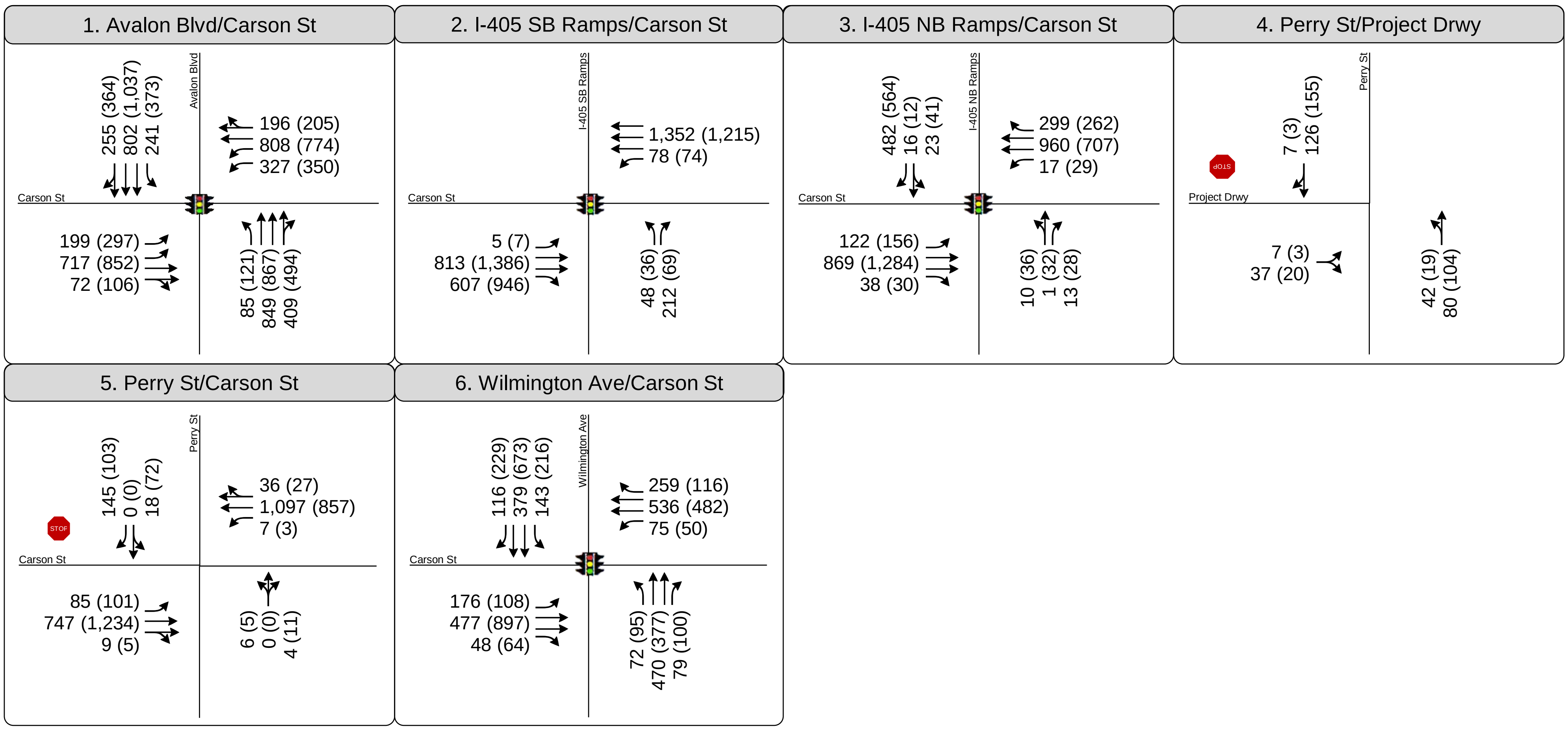


Traffic Volumes and Lane Configurations

Existing plus Ambient Growth plus Project Conditions - AM (PM) Peak Hour



Traffic Volumes and Lane Configurations
Future (Year 2023) Base Conditions - AM (PM) Peak Hour



Traffic Volumes and Lane Configurations
Future (Year 2023) plus Project Conditions - AM (PM) Peak Hour

APPENDIX B:
SIGNAL TIMING SHEETS

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09/KCH By: PMP

T.S. No.: 3991   Date Implemented: 10-19-09 By: [illegible]

1. CONFIGURATION SUBMENU

1. CONTROLLER SEQUENCE

PRIORITY	1	2	3	4	5	6	7	8	9	10	11	12
RING 1	1	2	3	4								
RING 2	5	6	7	8								
CG (CONCURRENT GROUPS)		X		X								

2. PHASES IN USE

	PHASE NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
PHASES IN USE	X	X	X	X	X	X	X	X				
EXCLUSIVE PED												

3. PHASE TO LOAD SWITCH (MMU) ASSIGNMENT

LOAD SWITCH (MMU)	SIGNAL DRIVER GROUP		LOAD SWITCH (MMU)	SIGNAL DRIVER GROUP	
CHANNEL	PHASE/OVLP	PED	CHANNEL	PHASE/OVLP	PED
1	1		9	2	X
2	2		10	4	X
3	3		11	6	X
4	4		12	8	X
5	5		13		
6	6		14		
7	7		15		
8	8		16		

4. SDLC OPTIONS/ENABLES

	BIU NUMBER							
	1	2	3	4	5	6	7	8
TERM & FACIL								
DETECTOR RACK								

TYPE 2 RUNS AS TYPE 1	
MMU DISABLE	X
DIAGNOSTIC ENABLE (TEST FIXTURE)	
PEER TO PEER ENABLE	

PEER TO PEER ADDRESS:

1)		2)		3)		4)		5)	
6)		7)		8)		9)		10)	

5. PORT 2 CONFIGURATION

PORT 2 PROTOCOL	
PORT 2 ENABLE	
DATA RATE (BPS)	
DATA, PARITY, STOP	
AB3418 ADDRESS	
AB3418 GROUP ADDRESS	
AB3418 RESPONSE DELAY	
AB3418 SINGLE FLAG ENABLE	
AB3418 DROP-OUT TIME	
AB3418 TOD SF SELECT	
AB3418 RTS TIMING	
AB3418 RTS TO CTS DELAY	
AB3418 RTS TURN-OFF DELAY	
AB3418 EARLY RTS	

6. PORT 3 CONFIGURATION

PORT 3 PROTOCOL	
PORT 3 ENABLE	
PORT 3 MILLISEC TIMING	
PORT 3 RTS TO CTS DELAY	
PORT 3 RTS TURN-OFF DELAY	
DUPLEX -- HALF OR FULL	
MODEM DATA RATE (BPS)	
DATA, PARITY, STOP	
TELEMETRY ADDRESS	
SYSTEM DETECTOR 9-16 ADDRESS	
TELEMETRY RESPONSE DELAY	
AB3418 ADDRESS	
AB3418 GROUP ADDRESS	
AB3418 RESPONSE DELAY	
AB3418 SINGLE FLAG ENABLE	
AB3418 DROP-OUT TIME	
AB3418 TOD SF SELECT	
AB3418 EARLY RTS	
RICOCHET OPTION	
RICOCHET ADDRESS	
Auto Status Destination ADDR	
Auto Status Report Delay	
Icons Live Time	

8. UTILITIES SUBMENU

5. SIGN ON

SOFTWARE ASSY		VERSION
BOOT		
MAIN PROGRAM		
HELP		
CONFIGURATION		

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991   Date Implemented: 10-19-09 By: [illegible]

1. CONFIGURATION SUBMENU (Continued)

7. ENABLE EVENT LOGS

CRITICAL RFE'S (MMU/TF)	X
NON-CRITICAL RFE'S(DET/TEST)	X
DETECTOR ERRORS	X
COORDINATION ERRORS	X
MMU FLASH FAULTS	X
LOCAL FLASH FAULTS	X
PREEMPT	X
POWER ON/OFF	X
LOW BATTERY	X
SPARE	
ALARM 1	X
ALARM 2	
ALARM 3	
ALARM 4	
ALARM 5	
ALARM 6	
ALARM 7	
ALARM 8	
ALARM 9	
ALARM 10	
ALARM 11	
ALARM 12	
ALARM 13	
ALARM 14	
ALARM 15	
ALARM 16	

8. OPTIONS

SUPERVISOR ACCESS CODE	
DATA CHANGE ACCESS CODE	
KEY CLICK ENABLE	
BACKLIGHT ENABLE	

9. MMU PROGRAM CAN SERVE WITH

PHASE	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

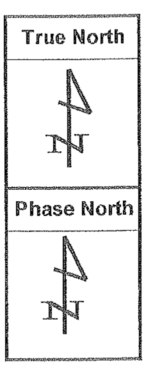
INTERSECTION: CARSON ST @ AVALON BLVD — Date Prepared: 9-30-09 HCH By: PMP

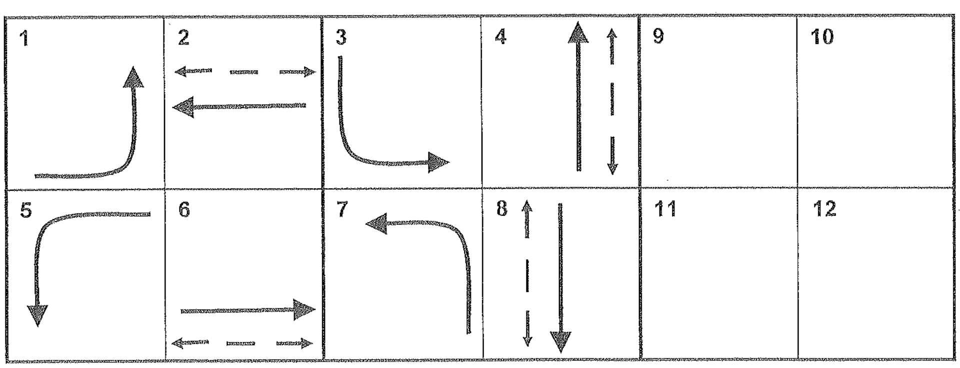
T.S. No.: 3991 — Date Implemented: 10-19-09 By: [illegible]

2. CONTROLLER SUBMENU

1. CONTROLLER TIMING DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MIN GREEN	4	6	4	6	4	6	4	6				
BIKE GREEN	0	0	0	0	0	0	0	0				
CS MIN GREEN	0	0	0	0	0	0	0	0				
WALK	0	7	0	7	0	7	0	7				
PED CLEAR	0	17	0	17	0	17	0	17				
VEH EXT	1.5	4.0	1.5	4.0	1.5	4.0	1.5	4.0				
VEH EXT 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
MAX EXT	0	0	0	0	0	0	0	0				
MAX 1	20	50	20	50	20	50	20	50				
MAX 2	20	130	20	50	20	130	20	50				
MAX 3	0	0	0	0	0	0	0	0				
DET MAX	0	0	0	0	0	0	0	0				
YELLOW	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5				
RED CLEAR	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0				
RED REVERT	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				
					0							
ACT B4	0	0	0	0	0	0	0	0				
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
MAX INITIAL	0	0	0	0	0	0	0	0				
TIME B4 REDUCTION	0	15	0	15	0	15	0	15				
CARS WT	0	255	0	255	0	255	0	255				
TIME TO REDUCE	0	15	0	15	0	15	0	15				
MIN GAP	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0				





COMMENTS:

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD

Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991

Date Implemented: 10-19-09 By: [illegible]

2. CONTROLLER SUBMENU (Continued)

2. PHASE OVERLAP ASSIGNMENTS

	OVERLAP CONSISTS OF PHASES:											
OVLP PHASE	1	2	3	4	5	6	7	8	9	10	11	12
1	X											
2		X										
3			X									
4				X								
5					X							
6						X						
7							X					
8								X				
9									X			
10										X		
11											X	
12												X

3. PED TIMING CARRYOVER

PHASE	CARRYOVER PHASE	PHASE	CARRYOVER PHASE
1		7	
2		8	
3		9	
4		10	
5		11	
6		12	

4. CONTROLLER RECALL DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
LOCKING MEMORY		X		X		X		X				
VEH RECALL												
PED RECALL												
RECALL TO MAX												
SOFT RECALL		X				X						
DON'T REST HERE												
PED DARK N/CALL												

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
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PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991   Date Implemented: ________ By: ______

2. CONTROLLER SUBMENU (Continued)

5. CONTROLLER OVERLAP DATA

OVERLAP A	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN TIMER												
LAG/LEAD GREEN TIMER												
LAG/LEAD YELLOW TIMER												
LAG/LEAD RED TIMER												

OVERLAP B	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN TIMER												
LAG/LEAD GREEN TIMER												
LAG/LEAD YELLOW TIMER												
LAG/LEAD RED TIMER												

OVERLAP C	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN TIMER												
LAG/LEAD GREEN TIMER												
LAG/LEAD YELLOW TIMER												
LAG/LEAD RED TIMER												

OVERLAP D	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN TIMER												
LAG/LEAD GREEN TIMER												
LAG/LEAD YELLOW TIMER												
LAG/LEAD RED TIMER												

PED OVERLAP ASSIGNMENTS
OVERLAP CONSISTS OF PHASES:

OVLP PHASE	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

LOS ANGELES COUNTY
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2. CONTROLLER SUBMENU (Continued)

6. CONTROLLER START/FLASH DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
POWER START		X				X						
EXTERNAL START		X				X						
ENTRY REM FLASH												
EXIT REM FLASH												
REM FLASH YELLOW												
FL TOGETHER PHS												
FL TOGETHER OVLPS	A			B			C			D		

POWER START	YELLOW	
EXTERNAL START	YELLOW	
POWER START ALL RED TIME	0	
POWER START FLASH TIME	0	
REMOTE FLASH OPTIONS:		
OUT OF FLASH YELLOW		
OUT OF FLASH ALL RED		
MINIMUM RECALL		
SPARE		
FLASH THRU LOAD SWITCHES		
CYCLE THROUGH PHASES		

7. NO SERVE PHASE

PHASE	12	11	10	9	8	7	6	5	4	3	2
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											

8. DIMMING

LOAD SWITCH	1	2	3	4	5	6	7	8
DIM GRN/WALK								
DIM YEL/PC								
DIM RED/DW								
LOAD SWITCH	9	10	11	12	13	14	15	16
DIM GRN/WALK								
DIM YEL/PC								
DIM RED/DW								

9. CONTROLLER OPTION DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
GUAR PASSAGE												
NON ACTUATED I												
NON ACTUATED II												
DUAL ENTRY												
COND SERVICE												
COND RESERVICE												
REST IN WALK												
FLASHING WALK												

FIVE SECTION LEFT TURN HEADS
(SPECIAL PROGRAM OPTION FOR STATE OF ILLINOIS)

5 - 2		7 - 4		1 - 6	
3 - 8		11 - 10		9 - 12	

DUAL ENTRY		RESERVED	
COND SERVICE ENABLE		BACKUP PROTECTION GROUP 1	
COND SERVICE DET X SWITCHING		BACKUP PROTECTION GROUP 2	
PED CLEAR PROTECT		BACKUP PROTECTION GROUP 3	
SPEC PREEMPT OVLP FLASH		SIMULTANEOUS GAP GROUP 1	ON
LOCK DETECTORS IN RED ONLY		SIMULTANEOUS GAP GROUP 2	ON
RESERVED		SIMULTANEOUS GAP GROUP 3	

LOS ANGELES COUNTY
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T.S. No.: 3991   Date Implemented: 10-19-09 By: [illegible]

3. COORDINATOR SUBMENU

TIME OF DAY OPERATION SUMMARY					
PLAN 1	0900 - 1500 M-F 1800 - 2100 M-F	PLAN 4		PLAN 7	
PLAN 2	0600 - 0900 M-F	PLAN 5		PLAN 8	
PLAN 3	1500 - 1800 M-F	PLAN 6		PLAN 9	
FREE	ALL OTHER TIMES				

1. COORDINATOR OPTIONS

SPLIT UNITS	SEC	ACTUATED COORD PHASE(S)	X
OFFSET UNITS	SEC	ACTUATED WALK/REST	
INTERCONNECT FORMAT	STD	INHIBIT MAX	
INTERCONNECT SOURCE	NIC	MAX 2 SELECT	X
RESYNC COUNT	255	MULTISYNC	
TRANSITION	SMOOTH	FLOAT FORCE OFF	
DWELL PERIOD	255		

FREE ALTERNATE SEQUENCE	A		B		C		D		E		F	

2. COORD MANUAL AND SPLIT DEMAND

MANUAL ENABLE		MANUAL PATTERN	

SPLIT DEMAND:	DEMAND 1	DEMAND 2
DEMAND CALL TIME	0	0
DEMAND CYCLE COUNT	0	0

DEMAND PHASE	1	2	3	4	5	6	7	8	9	10	11	12
DEMAND 1 PHASES												
DEMAND 2 PHASES												

3. COORD AUTO PERM MIN GREEN

PHASE	AUTO PERM MIN GREEN	PHASE	AUTO PERM MIN GRN
1	7	7	7
2	7	8	7
3	7	9	
4	7	10	
5	7	11	
6	7	12	

LOS ANGELES COUNTY
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T.S. No.: 3991

Date Prepared: 9-30-09 Hell By: ?mp

Date Implemented: 10-19-09 By: [illegible]

3. COORDINATOR SUBMENU (Continued)

4. PATTERN DATA

COORD PATTERN	1		
CYCLE LENGTH	120	C/O/S	1/1/1
OFFSET	38		

SPLITS							
PHASE 1	19	PHASE 2	16	PHASE 3	16	PHASE 4	38
PHASE 5	19	PHASE 6	16	PHASE 7	16	PHASE 8	38
PHASE 9		PHASE 10		PHASE 11		PHASE 12	
VEH PERMISSIVE	[1]	0		[2]	0		
VEH PERM 2 DISP							
PHASE RESERVICE							
SPLIT EXTENSION/RING	[1]	30		[2]	30		
SPL DMD PATTERN	[1]			[2]			
XARTERY PATTERN							

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												
	A	B	C	D	E	F						
ALTERNATE SEQUENCE												

COORD PATTERN	2		
CYCLE LENGTH	120	C/O/S	2/1/1
OFFSET	39		

SPLITS							
PHASE 1	19	PHASE 2	28	PHASE 3	16	PHASE 4	40
PHASE 5	19	PHASE 6	28	PHASE 7	16	PHASE 8	40
PHASE 9		PHASE 10		PHASE 11		PHASE 12	
VEH PERMISSIVE	[1]	0		[2]	0		
VEH PERM 2 DISP							
PHASE RESERVICE							
SPLIT EXTENSION/RING	[1]	16		[2]	16		
SPL DMD PATTERN	[1]			[2]			
XARTERY PATTERN							

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												
	A	B	C	D	E	F						
ALTERNATE SEQUENCE												

LOS ANGELES COUNTY
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INTERSECTION: CARSON ST @ AVALON BLVD

T.S. No.: 3991

Date Prepared: 9-30-09HdH By: PMP

Date Implemented: 10-19-09 By: [illegible]

3. COORDINATOR SUBMENU (Continued)

4. PATTERN DATA (Continued)

COORD PATTERN	3		
CYCLE LENGTH	120	C/O/S	3/1/1
OFFSET	48		

SPLITS							
PHASE 1	20	PHASE 2	26	PHASE 3	19	PHASE 4	38
PHASE 5	20	PHASE 6	26	PHASE 7	19	PHASE 8	38
PHASE 9		PHASE 10		PHASE 11		PHASE 12	

VEH PERMISSIVE	[1]	0	[2]	0
VEH PERM 2 DISP				
PHASE RESERVICE				
SPLIT EXTENSION/RING	[1]	16	[2]	16
SPL DMD PATTERN	[1]		[2]	
XARTERY PATTERN				

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

COORD PATTERN	4		
CYCLE LENGTH		C/O/S	
OFFSET			

SPLITS							
PHASE 1		PHASE 2		PHASE 3		PHASE 4	
PHASE 5		PHASE 6		PHASE 7		PHASE 8	
PHASE 9		PHASE 10		PHASE 11		PHASE 12	

VEH PERMISSIVE	[1]		[2]	
VEH PERM 2 DISP				
PHASE RESERVICE				
SPLIT EXTENSION/RING	[1]		[2]	
SPL DMD PATTERN	[1]		[2]	
XARTERY PATTERN				

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES												
VEHICLE RECALL												
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

Up to 64 Coordination Patterns Available.

LOS ANGELES COUNTY
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T.S. No.: 3991   (NOT USED)   Date Implemented: ______ By: ______

4. PREEMPTOR SUBMENU

1. PRIORITY PREEMPTOR 1

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			

3. PRIORITY PREEMPTOR 3

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

2. PRIORITY PREEMPTOR 2

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

4. PRIORITY PREEMPTOR 4

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HcH By: PMP

T.S. No.: 3991   (NOT USED)   Date Implemented: ______ By: ______

4. PREEMPTOR SUBMENU (Continued)

5. PRIORITY PREEMPTOR 5

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

6. PRIORITY PREEMPTOR 6

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

7. BUS PREEMPTORS

	BUS PREEMPTOR 1	2	3	4
PREEMPTOR ACTIVE				
DETECTOR LOCK				
MAXIMUM TIME				
RESERVICE TIME				
DELAY TIME				
INHIBIT TIME				
ENTRANCE GREEN				
ENTRANCE PED CLEAR				
ENTRANCE YELLOW				
ENTRANCE RED				
MIN HOLD TIME				

HOLD PHASE	1	2	3	4	5	6	7	8	9	10	11	12
PREEMPTOR 1												
PREEMPTOR 2												
PREEMPTOR 3												
PREEMPTOR 4												

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

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PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH By: [illegible]

T.S. No.: 3991   Date Implemented: 10-19-09 By: [illegible]

5. NIC/TOD SUBMENU

1. NIC/TOD CLOCK/CALENDAR DATA

DATE SET	
TIME SET	
MANUAL NIC PROGRAM STEP	0
MANUAL TOD PROGRAM STEP	0
SYNC REFERENCE TIME	★ ★ 0000
SYNC REFERENCE	REFERENCE TIME
WEEK 1 BEGINS ON 1ST SUNDAY	
DISABLE DAYLIGHT SAVINGS	
DST BEGINS LAST SUNDAY	

2. NIC/TOD WEEKLY PROGRAMS

WEEK	SUN	MON	TUE	WED	THU	FRI	SAT
1	2	1	1	1	1	1	2
2							
3							
4							
5							
6							
7							
8							
9							
10							

3. NIC/TOD YEARLY PROGRAMS

WEEK OF YEAR	1	2	3	4	5	6	7	8
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	9	10	11	12	13	14	15	16
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	17	18	19	20	21	22	23	24
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	25	26	27	28	29	30	31	32
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	33	34	35	36	37	38	39	40
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	41	42	43	44	45	46	47	48
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR				49	50	51	52	53
WEEKLY PROGRAM				1	1	1	1	1

4. NIC/TOD HOLIDAY PROGRAM

HOLIDAY	FLOAT/FIXED	MON/MON	DOW/DOM	WOM/YEAR	PROG
1	FIXED	1	1	0	2
2	FIXED	7	4	0	2
3	FIXED	11	11	0	2
4	FIXED	12	24	0	2
5	FIXED	12	25	0	2
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
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23					
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31					
32					
33					
34					
35					
36					

★ ★ **NOTE:** WHEN USING RCTB UNIT, IN ORDER FOR THE CONTROLLER CLOCK TO BE PROPERLY UPDATED, THE RCTB UNIT MUST BE DESIGNED FOR A 3:30 AM SYNC PULSE.

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991   Date Implemented: 10-19-09 By: [illegible]

5. NIC/TOD SUBMENU (Continued)

5. NIC PROGRAM STEP

STEP	PGM	TIME	PATTERN	OVERRIDE
1	1	0000	0	
2	2	0000	0	
3	1	0600	2	
4	1	0900	1	
5	1	1500	3	
6	1	1800	1	
7	1	2100	0	

Up to 200 NIC Program Steps Available.

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD

Date Prepared: 9-30-09 HcH By: PmP

T.S. No.: 3991

(NOT USED)

Date Implemented: ______ By: ______

5. NIC/TOD SUBMENU (Continued)

6. TOD PROGRAM STEPS

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD

Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991

(NOT USED)

Date Implemented: ______ By: ______

5. NIC/TOD SUBMENU (Continued)

6. TOD PROGRAM STEPS (CONTINUED)

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

Up to 100 TOD Program Steps Available.

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD — Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991 — Date Implemented: 10-19-09 By: [illegible]

6. DETECTORS SUBMENU

1. DETECTOR TYPE/TIMERS

DETECTOR	TYPE	LOCK	EXTEND	DELAY	NO RESET	LOG ENABLE
1	0					
2	5		2.0			
3	0					
4	5		2.0			
5	0					
6	5		2.0			
7	0					
8	5		2.0			
9	0					
10	0					
11	0					
12	0					
13	0					
14	0					
15						
16						
17						
18						
19						
20						
21						
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43						
44						
45						
46						
47						
48						
49						
50						
51						
52						
53						
54						
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57						
58						
59						
60						
61						
62						
63						
64						

2. DETECTOR PHASE ASSIGNMENT

	PHASE ASSIGNMENT											
DETECTOR	1	2	3	4	5	6	7	8	9	10	11	12
1	X											
2		X										
3			X									
4				X								
5					X							
6						X						
7							X					
8								X				
9						X						
10				X								
11		X										
12								X				
13	X											
14					X							
15												
16												
17												
18												
19												
20												
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22												
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62												
63												
64												

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HcH By: PMP

T.S. No.: 3991   Date Implemented: 10-14-09 By: [illegible]

6. DETECTORS SUBMENU (Continued)

3. PED AND SYSTEM DETECTOR LOCAL ASSIGNMENT

DETECTOR LOG INTERVAL				MINUTES				
LOCAL PED DET NUMBER	PHASE PED DETECTOR							
	1	2	3	4	5	6		
		2		4		6		
	7	8	9	10	11	12		
NUMBER		8						
LOCAL DET NUMBER	LOCAL SYSTEM DETECTOR NUMBER							
	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16
NUMBER								

Section 6-4: (See Next Page)

5. SPEED DETECTORS

SPEED DETECTOR NUMBERS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ONE DETECTOR SPEED:																
LOCAL DET NUMBER																
VEHICLE LENGTH																
LOOP LENGTH																
TWO DETECTOR SPEED:																
LOCAL DET NUMBER																
SPEED TRAP LENGTH																
ENABLE LOG																
UNITS:																

Section 6-6: (See Next Page)

7. PED DETECTOR DIAGNOSTIC PLAN

PLAN	DET NO.	1	2	3	4	5	6	7	8	9	10	11	12
1	DIAG NO.												
	SCALING												
2	DIAG NO.												
	SCALING												
3	DIAG NO.												
	SCALING												
4	DIAG NO.												
	SCALING												
5	DIAG NO.												
	SCALING												
6	DIAG NO.												
	SCALING												
7	DIAG NO.												
	SCALING												
8	DIAG NO.												
	SCALING												

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991   (NOT USED)   Date Implemented: ______ By: ______

6. DETECTORS SUBMENU (Continued)

4. CROSS SWITCHING

	PHASES											
DETECTOR	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
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61												
62												
63												
64												

6. VEHICLE DETECTOR DIAGNOSTIC PLAN

PLAN	DET NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	DIAG NO																
	SCALING																
2	DIAG NO																
	SCALING																
3	DIAG NO																
	SCALING																
4	DIAG NO																
	SCALING																
5	DIAG NO																
	SCALING																
6	DIAG NO																
	SCALING																
7	DIAG NO																
	SCALING																
8	DIAG NO																
	SCALING																
FAIL ACTION																	

PLAN	DET NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	DIAG NO																
	SCALING																
2	DIAG NO																
	SCALING																
3	DIAG NO																
	SCALING																
4	DIAG NO																
	SCALING																
5	DIAG NO																
	SCALING																
6	DIAG NO																
	SCALING																
7	DIAG NO																
	SCALING																
8	DIAG NO																
	SCALING																
FAIL ACTION																	

PLAN	DET NO.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1	DIAG NO																
	SCALING																
2	DIAG NO																
	SCALING																
3	DIAG NO																
	SCALING																
4	DIAG NO																
	SCALING																
5	DIAG NO																
	SCALING																
6	DIAG NO																
	SCALING																
7	DIAG NO																
	SCALING																
8	DIAG NO																
	SCALING																
FAIL ACTION																	

Vehicle Detector Diagnostic Plans for Detectors 49-64 Also Available.

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD   Date Prepared: 9-30-09 HCH   By: PMP

T.S. No.: 3991   (NOT USED)   Date Implemented: ______   By: ______

6. DETECTORS SUBMENU (Continued)

8. DETECTOR DIAGNOSTIC INTERVAL

DETECTOR DIAGNOSTIC INTERVAL			
DIAGNOSTIC NUMBER	NO ACTIVITY	MAX PRESENCE	ERRATIC COUNTS
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
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28			
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30			
31			
32			

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2S

PROGRAM REFERENCE CARD

INTERSECTION: CARSON ST @ AVALON BLVD

Date Prepared: 9-30-09 HCH By: PMP

T.S. No.: 3991

Date Implemented: 10-19-09 By: W

NOTE: NOT IN SEQUENTIAL ORDER

DETECTOR ASSIGNMENT WORK SHEET

LOOP LOCATION	LANE	DET ASSIGN	DET TYP #	PHASE 1	2	3	4	5	6	7	8	9	10	11	12	DET DELAY	DET EXTEND	QUEUE MAX	REMARKS
1-N-Ø3	LT	3	0			X													F
2-S-Ø4	1,2,3	4	5				X										2.0		Q
1-W-Ø1	LT-1	1	0	X															F
2-E-Ø2	1,2	2	5		X												2.0		Q
1-S-Ø7	LT	7	0							X									F
2-N-Ø8	1,2,3	8	5								X						2.0		Q
1-E-Ø5	LT-1	5	0					X											F
2-W-Ø6	1,2	6	5						X								2.0		Q
1-E-Ø2	1,2	11	0		X														A
1-N-Ø8	1,2	12	0								X								A
1-W-Ø6	1,2	9	0						X										A
1-S-Ø4	1,2	10	0				X												A
2-W-Ø1	LT-2	13	0	X															F
2-E-Ø5	LT-2	14	0					X											F

DETECTOR ASSIGNMENT DEFINITIONS

CONTROLLER	CONNECTOR'S A,B C								CONNECTOR D								CONNECTOR TELEMETRY								CONNECTOR TYPE 1							
ASC-2	DETECTOR								DETECTOR								DETECTOR								INPUT TYPE 1 ONLY							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

* = DELAY Time or EXTEND Time set on External Sensor

** = When the Detector Input is set to be a TYPE 4 Detector, the EXTEND value set in the Controller becomes the QUEUE MAX value and any Extension Time needed must be set externally on the Sensor. If the Detector Input is set to be a TYPE 5, the EXTEND value becomes a Reset (Gap) Timer value and the Extension Time is set Externally on the Sensor Unit.

Q = QUEUE CLEARING LOOP F = FIRST VEHICLE LOOP
H = HOLDING LOOP A = ADVANCE LOOP

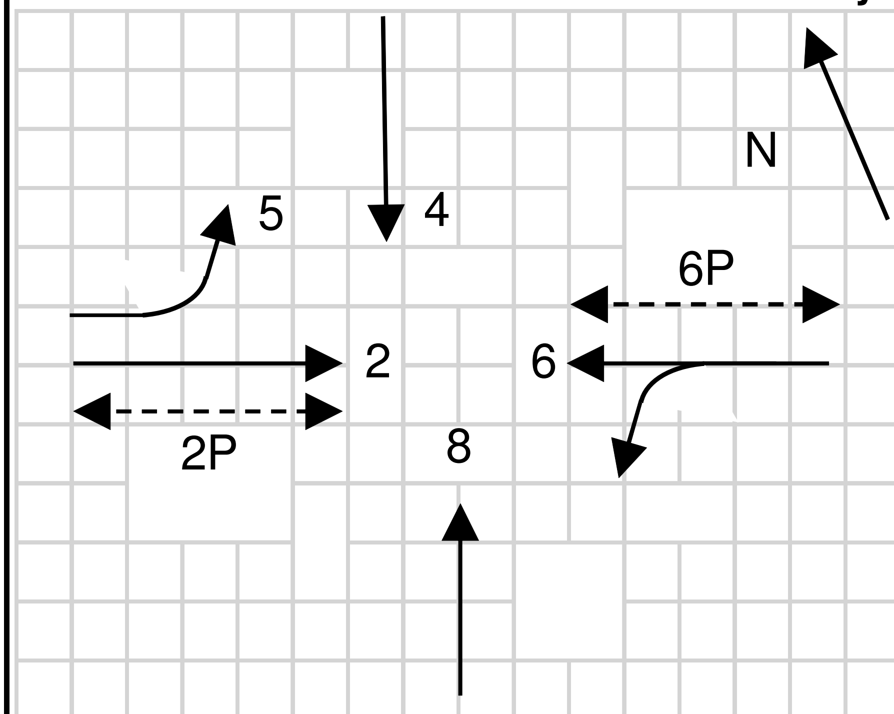
Location: R405 NB @ Carson St
Designed By: HD
System:
District: 07
Installed By: HD
Master At: Here
I/C: NB-SB Ramp
Service Info:

Timing Change:	Date Start:	Date End:	Designed:	Installed:
	10/29/2020		10/15/2020	10/29/2020

PHASE		FLASH
1)		[ ]
2)	EB Carson St (2ped)	[ ]
3)		[ ]
4)	NB off Ramp	[ ]
5)	EBLT Carson St	[ ]
6)	WB Carson St (6 ped)	[ ]
7)		[ ]
8)	NB Recreation Rd	[ ]

OVERLAP	
A)	[ ]
B)	[ ]
C)	[ ]
D)	[ ]
E)	[ ]
F)	[ ]

Intersection Layout



Comments and Notes:
* To prevent yellow trap WBLT (phase 5 place a call to phase 4 by 2-1-2-1)

RAM Checksum

Page 2:	5B9D	Page 8:	5996
Page 3:	034A	Page 9:	D2FD
Page 4:	A5B2	Page 10:	D42B
Page 5:	191A	Page 11:	C838
Page 6:	191A	Page 12:	1FB3
Page 7:	12D9	Page 13:	86F7

Post Mile: 10.58

Printed: 12/15/2021

Cabinet (9-3)
332
Configuration
CALTRANS

Phases (2-1-1-1)	
Permitted	. 2 . 4 5 6 . 8
Restricted	. . . .

CONFIGURATION PHASE FLAGS

Phase Recalls (2-1-1-2)	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . .
Pedestrian	. . . .
Bicycle	. . . .

Phase Locks (2-1-1-3)	
Red	. . . . 5 . . .
Yellow	. 2 . . . 6 . .
Force/Max	. . . .

Phase Features (2-1-1-4)	
Double Entry	. . . .
Rest In Walk	. . . .
Rest In Red	. . . .
Walk 2	. . . .
Max Green 2	. . . .
Max Green 3	. . . .

Startup (2-1-1-5)	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . . 4 . . . .
Vehicle Calls	. 2 . 4 5 6 . 8
Pedestrian Calls	. 2 . . . 6 . .
Yellow Start Overlaps	. . . . . .
Startup All-Red	6.0

Call To Phase (2-1-2-1)		Omit On Green	
1	. . . .	1	. . . .
2	. . . .	2	. . . .
3	. . . .	3	. . . .
4	. . . .	4	. . . .
5	. . . 4	5	. . . .
6	. . . .	6	. . . .
7	. . . .	7	. . . .
8	. . . .	8	. . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . .
Yellow Flash Overlaps	. . . . . .
Flash In Red Phases	. . . .
Flash In Red Overlaps	. . . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . .
Driveway Signal Phases	. . . .
Driveway Signal Overlaps	. . . . . .
Leading Ped Phases	. . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . .

Pedestrian (2-1-3)	
P1	. . . .
P2	. 2 . . . . . .
P3	. . . .
P4	. . . 4 . . . .
P5	. . . .
P6	. . . . . 6 . .
P7	. . . .
P8	 8

Overlap (2-1-4)

Overlap	Parent	Omit	No Start	Not
A	. . . .	. . . .	. . . .	. . . .
B	. . . .	. . . .	. . . .	. . . .
C	. . . .	. . . .	. . . .	. . . .
D	. . . .	. . . .	. . . .	. . . .
E	. . . .	. . . .	. . . .	. . . .
F	. . . .	. . . .	. . . .	. . . .

P H A S E   T I M I N G

Phase (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	7	0	0	0	7	0	0
Flash Don't Walk	0	25	0	0	0	18	0	0
Minimum Green	10	10	10	10	10	10	10	10
Det Limit	10	0	10	0	0	0	10	0
Max Initial	10	20	10	0	0	20	10	0
Max Green 1	50	40	50	20	20	40	50	20
Max Green 2	50	40	50	20	20	40	50	20
Max Green 3	50	40	50	20	20	40	50	20
Extension	5.0	4.0	5.0	3.0	2.5	4.0	5.0	3.0
Maximum Gap	5.0	5.0	5.0	3.0	2.5	5.0	5.0	3.0
Minimum Gap	5.0	3.0	5.0	3.0	2.5	3.0	5.0	3.0
Add Per Vehicle	1.0	2.0	1.0	0.0	0.0	2.0	1.0	0.0
Reduce Gap By	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Reduce Every	1.0	1.0	1.0	0.0	0.0	1.0	1.0	0.0
Yellow	5.0	4.4	5.0	4.1	3.7	4.4	5.0	4.1
All-Red	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Ped/Bike (2-3)	**-1-**	**-2-**	**-3-**	**-4-**	**-5-**	**-6-**	**-7-**	**-8-**
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	5.0
All-Red Sec/Min (2-6)	
All-Red Sec/Min:	OFF

Max 2 Extension

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

Local Plan 1...9 (7-1) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor	90		....	10				58		20	25	28		20
Plan 2	Green Factor	90		....	10				58		20	25	28		20
Plan 3	Green Factor	90		....	10				58		20	25	28		20
Plan 4	Green Factor			....											
Plan 5	Green Factor			....											
Plan 6	Green Factor			....											
Plan 7	Green Factor			....											
Plan 8	Green Factor			....											
Plan 9	Green Factor			....											

Local Plan 1...9 (7-1) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.2.4.6.8	.2...6..	....	....	....	....	.2...6..	....
Plan 2	.2.4.6.8	.2...6..	....	....	....	....	.2...6..	....
Plan 3	.2.4.6.8	.2...6..	....	....	....	....	.2...6..	....
Plan 4	....	....	....	....	....	....	....	....
Plan 5	....	....	....	....	....	....	....	....
Plan 6	....	....	....	....	....	....	....	....
Plan 7	....	....	....	....	....	....	....	....
Plan 8	....	....	....	....	....	....	....	....
Plan 9	....	....	....	....	....	....	....	....

Master Timer Sync (7-A)	
Enable in Plans	
1-9	....
11-19	....
21-29	....

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
.2.4.6.8	....
Veh Min	Veh Max
.2...6..	....
Ped	Bike
....	....
Cond	Cond Grn
....	10

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-29
254 = Flash
255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

Local Plan 11...19 (7-2) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 11	Green Factor			....											
Plan 12	Green Factor			....											
Plan 13	Green Factor			....											
Plan 14	Green Factor			....											
Plan 15	Green Factor			....											
Plan 16	Green Factor			....											
Plan 17	Green Factor			....											
Plan 18	Green Factor			....											
Plan 19	Green Factor			....											

Local Plan 11...19 (7-2) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 11	....	....	....	....	....	....	....	....
Plan 12	....	....	....	....	....	....	....	....
Plan 13	....	....	....	....	....	....	....	....
Plan 14	....	....	....	....	....	....	....	....
Plan 15	....	....	....	....	....	....	....	....
Plan 16	....	....	....	....	....	....	....	....
Plan 17	....	....	....	....	....	....	....	....
Plan 18	....	....	....	....	....	....	....	....
Plan 19	....	....	....	....	....	....	....	....

Local Plan 21...29 (7-3) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 21	Green Factor			....											
Plan 22	Green Factor			....											
Plan 23	Green Factor			....											
Plan 24	Green Factor			....											
Plan 25	Green Factor			....											
Plan 26	Green Factor			....											
Plan 27	Green Factor			....											
Plan 28	Green Factor			....											
Plan 29	Green Factor			....											

Local Plan 21...29 (7-3) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 21	....	....	....	....	....	....	....	....
Plan 22	....	....	....	....	....	....	....	....
Plan 23	....	....	....	....	....	....	....	....
Plan 24	....	....	....	....	....	....	....	....
Plan 25	....	....	....	....	....	....	....	....
Plan 26	....	....	....	....	....	....	....	....
Plan 27	....	....	....	....	....	....	....	....
Plan 28	....	....	....	....	....	....	....	....
Plan 29	....	....	....	....	....	....	....	....

DETECTORS

Detector Attributes (5-1) / **Slot** / **Detector Configuration (5-2)**

Det	Type	Phases	Lock	Slot	Det	Delay	Extend	Recall	Port
1	COUNT+CALL+EXTEND	1	NO	I1U	1			10	3.2
2	COUNT+CALL+EXTEND	1	NO	I1L	2			10	7.2
3	COUNT+CALL+EXTEND	. 2	NO	I2U	3			10	1.1
4	COUNT+CALL+EXTEND	. 2	NO	I2L	4			10	1.5
5	COUNT+CALL+EXTEND	. 2	NO	I3U	5			10	4.5
6	CALL+EXTEND	. 2	NO	I3L	6			10	6.2
7	LIMITED	. 2	NO	I4U	7			10	2.1
8	COUNT+CALL+EXTEND	. 2	NO	I4L	8			10	7.4
9	COUNT+CALL+EXTEND	. . 3	NO	I5U	9			10	3.4
10	COUNT+CALL+EXTEND	. . 3	NO	I5L	10			10	7.6
11	COUNT+CALL+EXTEND	. . . 4	NO	I6U	11			10	1.3
12	COUNT+CALL+EXTEND	. . . 4	NO	I6L	12			10	1.7
13	COUNT+CALL+EXTEND	. . . 4	NO	I7U	13			10	4.7
14	CALL+EXTEND	. . . 4	NO	I7L	14			10	6.4
15	LIMITED	. . . 4	NO	I8U	15			10	2.3
16	COUNT+CALL+EXTEND	. . . 4	NO	I8L	16			10	7.8
17	COUNT+CALL+EXTEND	1	NO	I9U	17			10	3.6
18	COUNT+CALL+EXTEND	. . 3	NO	I9L	18			10	3.8
19	COUNT+CALL+EXTEND	. 2	NO	I10U	19			10	4.1
20	COUNT+CALL+EXTEND	. . . 4	NO	I10L	20			10	4.2
21	COUNT+CALL+EXTEND	. . . . 5 . . .	NO	J1U	21			10	3.1
22	COUNT+CALL+EXTEND	. . . . 5 . . .	NO	J1L	22			10	7.1
23	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J2U	23			10	1.2
24	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J2L	24			10	1.6
25	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J3U	25			10	4.6
26	CALL+EXTEND	. . . . . 6 . .	NO	J3L	26			10	6.3
27	LIMITED	. . . . . 6 . .	NO	J4U	27			10	2.2
28	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J4L	28			10	7.3
29	COUNT+CALL+EXTEND	. . . . . . 7 .	NO	J5U	29			10	3.3
30	COUNT+CALL+EXTEND	. . . . . . 7 .	NO	J5L	30			10	7.5
31	COUNT+CALL+EXTEND	 8	NO	J6U	31			10	1.4
32	COUNT+CALL+EXTEND	 8	NO	J6L	32			10	1.8
33	COUNT+CALL+EXTEND	 8	NO	J7U	33			10	4.8
34	CALL+EXTEND	 8	NO	J7L	34			10	6.5
35	LIMITED	 8	NO	J8U	35			10	2.4
36	COUNT+CALL+EXTEND	 8	NO	J8L	36			10	7.7
37	COUNT+CALL+EXTEND	. . . . 5 . . .	NO	J9U	37			10	3.5
38	COUNT+CALL+EXTEND	. . . . . . 7 .	NO	J9L	38			10	3.7
39	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J10U	39			10	4.3
40	COUNT+CALL+EXTEND	 8	NO	J10L	40			10	4.4
41	PEDESTRIAN	. 2	NO	I12U	41			10	5.1
42	PEDESTRIAN	. . . 4	NO	I12L	42			10	5.3
43	PEDESTRIAN	. . . . . 6 . .	NO	I13U	43			10	5.2
44	PEDESTRIAN	 8	NO	I13L	44			10	5.4

Failure Times(5-3)	Minutes
Maximum On Time	
Fail Reset Time	

Failure Override (5-4)	
Detectors 1-8	. . . .
Detectors 9-16	. . . .
Detectors17-24	. . . .
Detectors 25-32	. . . .
Detectors 33-40	. . . .
Detectors 41-44	. . . .

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Nu								
Sys Det	9	10	11	12	13	14	15	16
Det Nu								

CIC Operation (5-6-1)	
Enable in Plans	. . . .

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.00	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase								
Sys Det	9	10	11	12	13	14	15	16
Phase								

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6	4.1	6.6	5.1	5.2	6.7
	7.2	1.5	6.2	7.4	7.6	1.7	6.4	7.8	3.8	4.2	2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5	4.3	2.8	5.5	5.6	2.5
	7.1	1.6	6.3	7.3	7.5	1.8	6.5	7.7	3.7	4.4	6.1	5.7	5.8	2.6

TOD SCHEDULE

Table 1 (8-2-1)		
Time	Plan	OS
0600	2	A
0900	255	A
1500	3	A
1800	1	A
2000	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)		
Time	Plan	OS
0630	1	A
0900	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1			....	
2			....	
3			....	
4			....	
5			....	
6			....	
7			....	
8			....	
9			....	
10			....	
11			....	
12			....	
13			....	
14			....	
15			....	
16			....	

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1			....	
2			....	
3			....	
4			....	
5			....	
6			....	
7			....	
8			....	
9			....	
10			....	
11			....	
12			....	
13			....	
14			....	
15			....	
16			....	

Daylight Saving (8-1)

Enabled	YES

	Month	Sunday
Start	MAR	2nd
End	NOV	1st

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	....
Holiday	....

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1			....		....
2			....		....
3			....		....
4			....		....
5			....		....
6			....		....
7			....		....
8			....		....
9			....		....
10			....		....
11			....		....
12			....		....
13			....		....
14			....		....
15			....		....
16			....		....

Action Codes:
0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11.Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting
100+Action Code = Phases removed
200+Action Code = Phases replaced

COMMUNICATIONS

	C2 (6-1-1)	C20 (6-1-2)	C21 (6-1-3)
Address			
Baud	1200	1200	1200
Protocol	MASTER	AB3418	AB3418
Data Bits	8	8	8
Parity	NONE	NONE	NONE
Stop Bits	1	1	1
RTS On Time	20	20	20
RTS Off Time	20	20	20
Handshaking	NORMAL	NORMAL	NORMAL
Access Level	0	0	0

CALLBACK NUMBERS

Callback Numbers (6-3...3)			
Line Out			
Long Distance			
Local Toll			
Delay	10	10	10
Area Code			
Phone Number			

SOFT LOGIC

Soft Logic (6-2)

#	Data	OP	Data	OP	Data	OP	Data
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

*Refer to User's Manual for Data and OP Codes

NETWORK

Network Parameters (6-4)	
Address	
Protocol	AB3418
Port	27000
Type	STATIC
Central Access	
Field Access	
ATSPM	OFF

IP Address	0	0	0	0
Netmask	255	255	255	0
Broadcast	0	0	0	255
Gateway	0	0	0	254

Access Levels:

0-Full Access
1-Status Only
2-Status, Set Pattern, Time
3-Status, Set Pattern, Time, Manual Plan
4-Reserved
5-Full Access with No Set Pattern
6-Full Access with No Set Time
7-Full Access with No Set Pattern, Manual Plan
8-Full Access with No Set Time, Pattern, Manual Plan

SPAT Network (6-5)		
SPAT	1	2
Protocol	NONE	NONE
UDP Port	0	0

IP Address 0 . 0 . 0 . 0

RAILROAD PREEMPTION

RR 1

Timing (3-1-1)	
Clear 1	15
Clear 2	5
Clear 3	
Hold	
Min Gr	
Delay	
Exit	
Ped Clr	

Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
. 2 . . 5 . . .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. 2 . . 5 . . .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . . . .	. . . . . .	. . . . . .
1 . . 4 . . 7 8	. . . .	. . . .	. . . .	. . . 4 . . . 8	. 2 . . . 6 . .	. . . . . .	. . . . . .	. . . . . .

Exit Parameters (3-1-5)			
Phase Green	Ovrlap Green	Veh Permit/Call	Ped Permit/Call
. 2 . . . 6 . .	. . . . . .	1 2 3 4 5 6 7 8	. 2 . 4 . 6 . 8

Configuration (3-1-6)

	PR	XR	Gate	Isld	APP	Sign	Sign	Max On	Latching
1								5	NO
2									

Valid Inputs: 1.x, 2.x, 3.x, 4.x, 5.x, 6.x, 7.x, 8.x x=1 to 8
Valid Outputs: 11.x, 12.x, 13.x, 14.x, 15.x, 16.x, 17.x, 18.x x=1 to 8

RR 2

Timing (3-2-1)	
Clear 1	15
Clear 2	5
Clear 3	
Hold	
Min Gr	
Delay	
Exit	
Ped Clr	

Phase Flags (3-2-2)			Pedestrian Flags (3-2-3)			Overlap Flags (3-2-4)		
Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
. . . 4 . . 7 .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . 4 . . 7 .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . . . .	. . . . . .	. . . . . .
1 2 3 . . 6 . .	. . . .	. . . .	. . . .	. 2 . . . 6 . .	. . . 4 . . . 8	. . . . . .	. . . . . .	. . . . . .

Exit Parameters (3-2-5)			
Phase Green	Ovrlap Green	Veh Permit	Ped Permit
. 2 . . . 6 . .	. . . . . .	1 2 3 4 5 6 7 8	. 2 . 4 . 6 . 8

Configuration (3-2-6)

	PR	XR	Gate	Isld	APP	Sign	Sign	Max On	Latching
1								5	NO
2									

Valid Inputs: 1.x, 2.x, 3.x, 4.x, 5.x, 6.x, 7.x, 8.x x=1 to 8
Valid Outputs: 11.x, 12.x, 13.x, 14.x, 15.x, 16.x, 17.x, 18.x x=1 to 8

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	. 2 . . 5 . . .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVB (3-B)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	. . . 4 . . 7 .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVC (3-C)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	1 . . . . 6 . .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVD (3-D)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	. . 3 8	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

INPUTS

		7 Wire I/C (2-1-5-1)			
		Input	Port	Input	Port
Enable	NO	RR1		Free	
Max ON		RR2		D2	
Max OFF		RR3		D3	

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	
Advance Enable	

Cabinet Status (2-1-5-3	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Battery Backup (2-1-5-5)	
Port	Operation
	NORMAL

Y-Coordination (2-1-5-6	
Port C	Port D

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:
- 0 Unused (no output)
- 1-8 Vehicle 1-8
- 9-14 Overlap A-F
- 21-28 Ped 1-8
- 41-47 Special Functions
- 41 Protected Permissive Flashing Phase 1
- 43 Protected Permissive Flashing Phase 3
- 45 Protected Permissive Flashing Phase 5
- 47 Protected Permissive Flashing Phase 7
- 51-57 Special Functions
- 71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6 Channel 9 and 10

INTERVAL CONTROL

Interval Control (3-3-1)	Time	Phase Control (3-3-2) Hold	Force	Advance	Phase Recall (3-3-3) Veh Call	Ped Call	Int Call	Phase Permitted (3-3-4) Phs Permit	Ped Permit	Ovrlap Permit
Step 1		....	....	....	....	....	....	....	....	......
Step 2		....	....	....	....	....	....	....	....	......
Step 3		....	....	....	....	....	....	....	....	......
Step 4		....	....	....	....	....	....	....	....	......
Step 5		....	....	....	....	....	....	....	....	......
Step 6		....	....	....	....	....	....	....	....	......
Step 7		....	....	....	....	....	....	....	....	......
Step 8		....	....	....	....	....	....	....	....	......

Configuration (3-3-5)			
Input	Port	Delay	HRI Cross
1			
2			

HRI

HRI Configuration (3-4)	
RailRoad	51
Line	
Group	

	WAYSIDE	ATC
Subnode		
Device		

TRANSIT PRIORITY

Local Plans (3-E) 1...9 11...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											
Plan 11	Green Factor											
Plan 12	Green Factor											
Plan 13	Green Factor											
Plan 14	Green Factor											
Plan 15	Green Factor											
Plan 16	Green Factor											
Plan 17	Green Factor											
Plan 18	Green Factor											
Plan 19	Green Factor											

Transit Priority Configuration (3-E-A)				Indicator Output	
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	. . . .	0.0	NONE	0	0
Plan 11-19	. . . .	0.0	NONE	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
	. . . .
	. . . .

Free Plans (3-E-E)	
Max Grn Hold	Hold Phase
	. . . .

Access Utilities (9-5)	
Password	***
Timeout	30

YELLOW YIELD COORDINATION

Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	Force-Offs -1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . .	. . . .
Plan D													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . .	. . . .

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
					. . . .	0.0	0.0	0.0	0	0.0	0

2070 Controller TSCP Timing Chart **TSCP: 3.03** **PAGE 1**

Location: R405 SB @ Carson St
System:
Master At: NB Ramp

District: 07
I/C: SB-NB Ramp

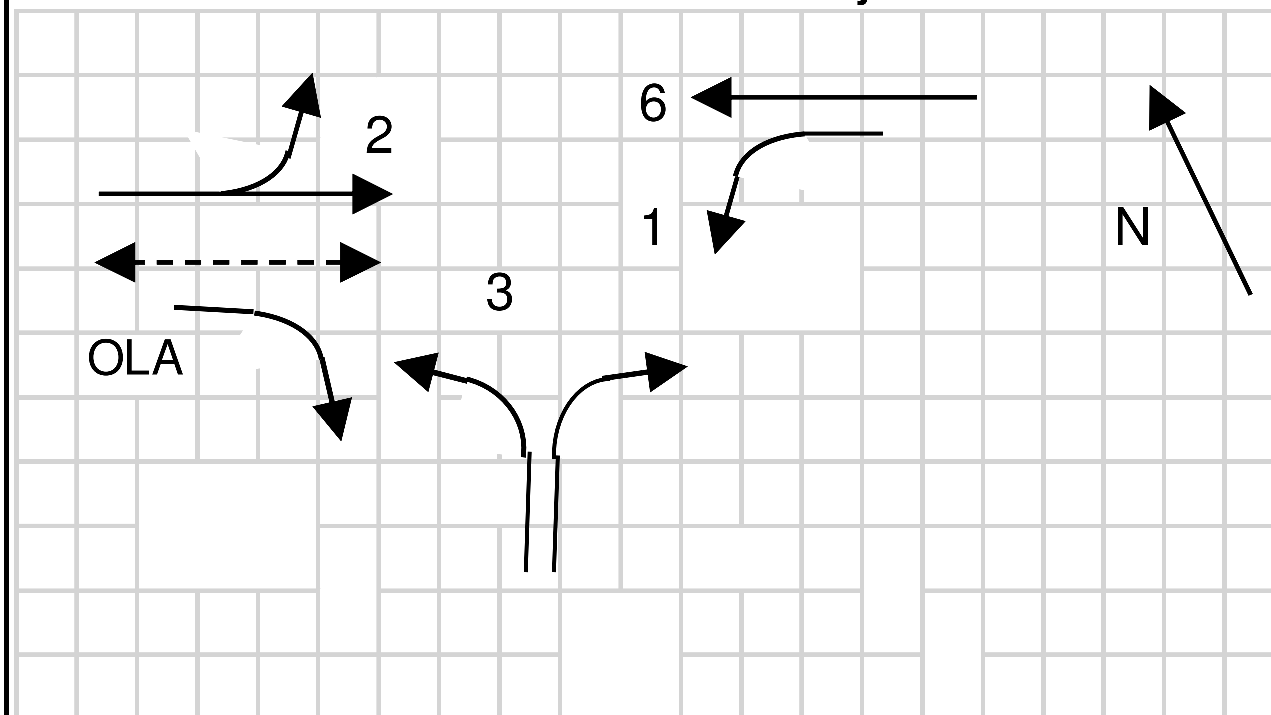
Designed By: HD
Installed By: HD
Service Info:

Timing Change:	Date Start:	Date End:	Designed:	Installed:
	10/29/2020		10/15/2020	10/29/2020

PHASE		FLASH
1)	WBLT Carson St	[ ]
2)	EB Carson St (2 ped)	[ ]
3)	SB off Ramp	[ ]
4)		[ ]
5)		[ ]
6)	WB Carson St	[ ]
7)		[ ]
8)		[ ]

OVERLAP	FLASH
A)	[ ]
B)	[ ]
C)	[ ]
D)	[ ]
E)	[ ]
F)	[ ]

Intersection Layout



Comments and Notes:
* To prevent yellow trap EBLT (phase 1 Place a call to phase 3 by 2-1-2-1)
* OLA (2 color) EBRT on Ramp is on with phase 3

RAM Checksum

Page 2:	AA7B	Page 8:	5996
Page 3:	0F2D	Page 9:	D2FD
Page 4:	6A0D	Page 10:	22C1
Page 5:	191A	Page 11:	C838
Page 6:	191A	Page 12:	1FB3
Page 7:	12D9	Page 13:	86F7

Post Mile: 10.54

Printed: 12/15/2021

CONFIGURATION PHASE FLAGS

Cabinet (9-3)
332
Configuration
CALTRANS

Phases (2-1-1-1)	
Permitted	1 2 3 . . 6 . .
Restricted	. . . .

Phase Features (2-1-1-4)	
Double Entry	. . . .
Rest In Walk	. . . .
Rest In Red	. . . .
Walk 2	. . . .
Max Green 2	. . . .
Max Green 3	. . . .

Startup (2-1-1-5)	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . 3 . . . . .
Vehicle Calls	1 2 3 . . 6 . .
Pedestrian Calls	. 2 . . . . . .
Yellow Start Overlaps	. . . . . .
Startup All-Red	6.0

Phase Recalls (2-1-1-2)	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . .
Pedestrian	. . . .
Bicycle	. . . .

Phase Locks (2-1-1-3)	
Red	1 . . . .
Yellow	. 2 . . . 6 . .
Force/Max	. . . .

Call To Phase (2-1-2-1)		Omit On Green	
1	. . 3	1	. . . .
2	. . . .	2	. . . .
3	. . . .	3	. . . .
4	. . . .	4	. . . .
5	. . . .	5	. . . .
6	. . . .	6	. . . .
7	. . . .	7	. . . .
8	. . . .	8	. . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . .
Yellow Flash Overlaps	. . . . . .
Flash In Red Phases	. . . .
Flash In Red Overlaps	. . . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . .
Driveway Signal Phases	. . . .
Driveway Signal Overlaps	. . . . . .
Leading Ped Phases	. . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . .

Pedestrian (2-1-3)	
P1	. . . .
P2	. 2 . . . . . .
P3	. . . .
P4	. . . 4 . . . .
P5	. . . .
P6	. . . . . 6 . .
P7	. . . .
P8	 8

Overlap (2-1-4)

Overlap	Parent	Omit	No Start	Not
A	. . 3	. . . .	. . . .	. . . .
B	. . . .	. . . .	. . . .	. . . .
C	. . . .	. . . .	. . . .	. . . .
D	. . . .	. . . .	. . . .	. . . .
E	. . . .	. . . .	. . . .	. . . .
F	. . . .	. . . .	. . . .	. . . .

PHASE TIMING

Phase (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	7	0	10	0	0	0	10
Flash Don't Walk	0	30	0	10	0	0	0	10
Minimum Green	10	10	10	10	10	10	10	10
Det Limit	0	0	0	10	10	0	10	10
Max Initial	0	20	0	10	10	20	10	10
Max Green 1	20	40	25	50	50	40	50	50
Max Green 2	20	40	25	50	50	40	50	50
Max Green 3	20	40	25	50	50	40	50	50
Extension	2.5	4.0	3.0	5.0	5.0	4.0	5.0	5.0
Maximum Gap	2.5	5.0	3.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap	2.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Add Per Vehicle	0.0	2.0	0.0	1.0	1.0	2.0	1.0	1.0
Reduce Gap By	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Reduce Every	0.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Yellow	3.7	4.4	4.1	5.0	5.0	4.4	5.0	5.0
All-Red	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Ped/Bike (2-3)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	5.0
All-Red Sec/Min (2-6)	
All-Red Sec/Min:	OFF

Max 2 Extension

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

Local Plan 1...9 (7-1) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor	90		....	9			16	37	20			58		
Plan 2	Green Factor	90		....	9			16	37	20			58		
Plan 3	Green Factor	90		....	9			16	37	20			58		
Plan 4	Green Factor			....											
Plan 5	Green Factor			....											
Plan 6	Green Factor			....											
Plan 7	Green Factor			....											
Plan 8	Green Factor			....											
Plan 9	Green Factor			....											

Local Plan 1...9 (7-1) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.2.4.6.8	.2...6..	....	....	....	....	.2......	....
Plan 2	.2.4.6.8	.2...6..	....	....	....	....	.2......	....
Plan 3	.2.4.6.8	.2...6..	....	....	....	....	.2......	....
Plan 4	....	....	....	....	....	....	....	....
Plan 5	....	....	....	....	....	....	....	....
Plan 6	....	....	....	....	....	....	....	....
Plan 7	....	....	....	....	....	....	....	....
Plan 8	....	....	....	....	....	....	....	....
Plan 9	....	....	....	....	....	....	....	....

Master Timer Sync (7-A)	
Enable in Plans	
1-9	....
11-19	....
21-29	....

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
.2.4.6.8	....
Veh Min	Veh Max
.2...6..	....
Ped	Bike
....	....
Cond	Cond Grn
....	10

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-29
254 = Flash
255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

Local Plan 11...19 (7-2) TIMING DATA

COORDINATION

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
					[Offsets		]	Green Factors or Press [F] to Select Force-Off							
Plan 11	Green Factor			....											
Plan 12	Green Factor			....											
Plan 13	Green Factor			....											
Plan 14	Green Factor			....											
Plan 15	Green Factor			....											
Plan 16	Green Factor			....											
Plan 17	Green Factor			....											
Plan 18	Green Factor			....											
Plan 19	Green Factor			....											

Local Plan 11...19 (7-2) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 11	....	....	....	....	....	....	....	....
Plan 12	....	....	....	....	....	....	....	....
Plan 13	....	....	....	....	....	....	....	....
Plan 14	....	....	....	....	....	....	....	....
Plan 15	....	....	....	....	....	....	....	....
Plan 16	....	....	....	....	....	....	....	....
Plan 17	....	....	....	....	....	....	....	....
Plan 18	....	....	....	....	....	....	....	....
Plan 19	....	....	....	....	....	....	....	....

Local Plan 21...29 (7-3) TIMING DATA

COORDINATION

		Cycle	Multi	Lag Gap	[Offsets	]		Green Factors or Press [F] to Select Force-Off							
					A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 21	Green Factor			....											
Plan 22	Green Factor			....											
Plan 23	Green Factor			....											
Plan 24	Green Factor			....											
Plan 25	Green Factor			....											
Plan 26	Green Factor			....											
Plan 27	Green Factor			....											
Plan 28	Green Factor			....											
Plan 29	Green Factor			....											

Local Plan 21...29 (7-3) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 21	....	....	....	....	....	....	....	....
Plan 22	....	....	....	....	....	....	....	....
Plan 23	....	....	....	....	....	....	....	....
Plan 24	....	....	....	....	....	....	....	....
Plan 25	....	....	....	....	....	....	....	....
Plan 26	....	....	....	....	....	....	....	....
Plan 27	....	....	....	....	....	....	....	....
Plan 28	....	....	....	....	....	....	....	....
Plan 29	....	....	....	....	....	....	....	....

DETECTORS

Detector Attributes (5-1) / Slot / Detector Configuration (5-2)

Det	Type	Phases	Lock	Slot	Det	Delay	Extend	Recall	Port
1	COUNT+CALL+EXTEND	1	NO	I1U	1			10	3.2
2	COUNT+CALL+EXTEND	1	NO	I1L	2			10	7.2
3	COUNT+CALL+EXTEND	. 2	NO	I2U	3			10	1.1
4	COUNT+CALL+EXTEND	. 2	NO	I2L	4			10	1.5
5	COUNT+CALL+EXTEND	. 2	NO	I3U	5			10	4.5
6	CALL+EXTEND	. 2	NO	I3L	6			10	6.2
7	LIMITED	. 2	NO	I4U	7			10	2.1
8	COUNT+CALL+EXTEND	. 2	NO	I4L	8			10	7.4
9	COUNT+CALL+EXTEND	. . 3	NO	I5U	9			10	3.4
10	COUNT+CALL+EXTEND	. . 3	NO	I5L	10			10	7.6
11	COUNT+CALL+EXTEND	. . . 4	NO	I6U	11			10	1.3
12	COUNT+CALL+EXTEND	. . . 4	NO	I6L	12			10	1.7
13	COUNT+CALL+EXTEND	. . . 4	NO	I7U	13			10	4.7
14	CALL+EXTEND	. . . 4	NO	I7L	14			10	6.4
15	LIMITED	. . . 4	NO	I8U	15			10	2.3
16	COUNT+CALL+EXTEND	. . . 4	NO	I8L	16			10	7.8
17	COUNT+CALL+EXTEND	1	NO	I9U	17			10	3.6
18	COUNT+CALL+EXTEND	. . 3	NO	I9L	18			10	3.8
19	COUNT+CALL+EXTEND	. 2	NO	I10U	19			10	4.1
20	COUNT+CALL+EXTEND	. . . 4	NO	I10L	20			10	4.2
21	COUNT+CALL+EXTEND	. . . . 5 . . .	NO	J1U	21			10	3.1
22	COUNT+CALL+EXTEND	. . . . 5 . . .	NO	J1L	22			10	7.1
23	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J2U	23			10	1.2
24	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J2L	24			10	1.6
25	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J3U	25			10	4.6
26	CALL+EXTEND	. . . . . 6 . .	NO	J3L	26			10	6.3
27	LIMITED	. . . . . 6 . .	NO	J4U	27			10	2.2
28	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J4L	28			10	7.3
29	COUNT+CALL+EXTEND	. . . . . . 7 .	NO	J5U	29			10	3.3
30	COUNT+CALL+EXTEND	. . . . . . 7 .	NO	J5L	30			10	7.5
31	COUNT+CALL+EXTEND	 8	NO	J6U	31			10	1.4
32	COUNT+CALL+EXTEND	 8	NO	J6L	32			10	1.8
33	COUNT+CALL+EXTEND	 8	NO	J7U	33			10	4.8
34	CALL+EXTEND	 8	NO	J7L	34			10	6.5
35	LIMITED	 8	NO	J8U	35			10	2.4
36	COUNT+CALL+EXTEND	 8	NO	J8L	36			10	7.7
37	COUNT+CALL+EXTEND	. . . . 5 . . .	NO	J9U	37			10	3.5
38	COUNT+CALL+EXTEND	. . . . . . 7 .	NO	J9L	38			10	3.7
39	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J10U	39			10	4.3
40	COUNT+CALL+EXTEND	 8	NO	J10L	40			10	4.4
41	PEDESTRIAN	. 2	NO	I12U	41			10	5.1
42	PEDESTRIAN	. . . 4	NO	I12L	42			10	5.3
43	PEDESTRIAN	. . . . . 6 . .	NO	I13U	43			10	5.2
44	PEDESTRIAN	 8	NO	I13L	44			10	5.4

Failure Times(5-3)	Minutes
Maximum On Time	
Fail Reset Time	

Failure Override (5-4)	
Detectors 1-8	. . . .
Detectors 9-16	. . . .
Detectors17-24	. . . .
Detectors 25-32	. . . .
Detectors 33-40	. . . .
Detectors 41-44	. . . .

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Nu								
Sys Det	9	10	11	12	13	14	15	16
Det Nu								

CIC Operation (5-6-1)	
Enable in Plans	. . . .

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.00	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase								
Sys Det	9	10	11	12	13	14	15	16
Phase								

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6	4.1	6.6	5.1	5.2	6.7
	7.2	1.5	6.2	7.4	7.6	1.7	6.4	7.8	3.8	4.2	2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5	4.3	2.8	5.5	5.6	2.5
	7.1	1.6	6.3	7.3	7.5	1.8	6.5	7.7	3.7	4.4	6.1	5.7	5.8	2.6

TOD SCHEDULE

Table 1 (8-2-1)		
Time	Plan	OS
0600	2	A
0900	255	A
1500	3	A
1800	1	A
2000	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)		
Time	Plan	OS
0630	1	A
0900	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1			. . . .	
2			. . . .	
3			. . . .	
4			. . . .	
5			. . . .	
6			. . . .	
7			. . . .	
8			. . . .	
9			. . . .	
10			. . . .	
11			. . . .	
12			. . . .	
13			. . . .	
14			. . . .	
15			. . . .	
16			. . . .	

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1			. . . .	
2			. . . .	
3			. . . .	
4			. . . .	
5			. . . .	
6			. . . .	
7			. . . .	
8			. . . .	
9			. . . .	
10			. . . .	
11			. . . .	
12			. . . .	
13			. . . .	
14			. . . .	
15			. . . .	
16			. . . .	

Daylight Saving (8-1)

Enabled	YES

	Month	Sunday
Start	MAR	2nd
End	NOV	1st

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	. . . .
Holiday	. . . .

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1			. . . .		. . . .
2			. . . .		. . . .
3			. . . .		. . . .
4			. . . .		. . . .
5			. . . .		. . . .
6			. . . .		. . . .
7			. . . .		. . . .
8			. . . .		. . . .
9			. . . .		. . . .
10			. . . .		. . . .
11			. . . .		. . . .
12			. . . .		. . . .
13			. . . .		. . . .
14			. . . .		. . . .
15			. . . .		. . . .
16			. . . .		. . . .

Action Codes:

0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11.Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting
100+Action Code = Phases removed
200+Action Code = Phases replaced

COMMUNICATIONS

	C2 (6-1-1)	C20 (6-1-2)	C21 (6-1-3)
Address	1		
Baud	1200	1200	1200
Protocol	AB3418	AB3418	AB3418
Data Bits	8	8	8
Parity	NONE	NONE	NONE
Stop Bits	1	1	1
RTS On Time	20	20	20
RTS Off Time	20	20	20
Handshaking	NORMAL	NORMAL	NORMAL
Access Level	0	0	0

CALLBACK NUMBERS

Callback Numbers (6-3...3)

Line Out			
Long Distance			
Local Toll			
Delay	10	10	10
Area Code			
Phone Number			

SOFT LOGIC

Soft Logic (6-2)

#	Data	OP	Data	OP	Data	OP	Data
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

*Refer to User's Manual for Data and OP Codes

NETWORK

Network Parameters (6-4)

Address	
Protocol	AB3418
Port	27000
Type	STATIC
Central Access	
Field Access	
ATSPM	OFF

IP Address	0 .	0 .	0 .	0
Netmask	255 .	255 .	255 .	0
Broadcast	0 .	0 .	0 .	255
Gateway	0 .	0 .	0 .	254

Access Levels:

0-Full Access
1-Status Only
2-Status, Set Pattern, Time
3-Status, Set Pattern, Time, Manual Plan
4-Reserved
5-Full Access with No Set Pattern
6-Full Access with No Set Time
7-Full Access with No Set Pattern, Manual Plan
8-Full Access with No Set Time, Pattern, Manual Plan

SPAT Network (6-5)

SPAT	1	2
Protocol	NONE	NONE
UDP Port	0	0

IP Address 0 . 0 . 0 . 0

RAILROAD PREEMPTION

RR 1

Timing (3-1-1)	
Clear 1	15
Clear 2	5
Clear 3	
Hold	
Min Gr	
Delay	
Exit	
Ped Clr	

Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
. 2 . . 5 . . .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. 2 . . 5 . . .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . . . .	. . . . . .	. . . . . .
1 . . 4 . . 7 8	. . . .	. . . .	. . . .	. . . 4 . . . 8	. 2 . . . 6 . .	. . . . . .	. . . . . .	. . . . . .

Exit Parameters (3-1-5)			
Phase Green	Ovrlap Green	Veh Permit/Call	Ped Permit/Call
. 2 . . . 6 . .	. . . . . .	1 2 3 4 5 6 7 8	. 2 . 4 . 6 . 8

Configuration (3-1-6)	PR	XR	Gate	Isld	APP	Sign	Sign	Max On	Latching
1								5	NO
2									

Valid Inputs: 1.x, 2.x, 3.x, 4.x, 5.x, 6.x, 7.x, 8.x x=1 to 8
Valid Outputs: 11.x, 12.x, 13.x, 14.x, 15.x, 16.x, 17.x, 18.x x=1 to 8

RR 2

Timing (3-2-1)	
Clear 1	15
Clear 2	5
Clear 3	
Hold	
Min Gr	
Delay	
Exit	
Ped Clr	

Phase Flags (3-2-2)			Pedestrian Flags (3-2-3)			Overlap Flags (3-2-4)		
Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
. . . 4 . . 7 .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . 4 . . 7 .	. . . .	. . . .	. . . .	. . . .	. 2 . 4 . 6 . 8	. . . . . .	. . . . . .	. . . . . .
. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . . . .	. . . . . .	. . . . . .
1 2 3 . . 6 . .	. . . .	. . . .	. . . .	. 2 . . . 6 . .	. . . 4 . . . 8	. . . . . .	. . . . . .	. . . . . .

Exit Parameters (3-2-5)			
Phase Green	Ovrlap Green	Veh Permit	Ped Permit
. 2 . . . 6 . .	. . . . . .	1 2 3 4 5 6 7 8	. 2 . 4 . 6 . 8

Configuration (3-2-6)	PR	XR	Gate	Isld	APP	Sign	Sign	Max On	Latching
1								5	NO
2									

Valid Inputs: 1.x, 2.x, 3.x, 4.x, 5.x, 6.x, 7.x, 8.x x=1 to 8
Valid Outputs: 11.x, 12.x, 13.x, 14.x, 15.x, 16.x, 17.x, 18.x x=1 to 8

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	. 2 . . 5 . . .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVB (3-B)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	. . . 4 . . 7 .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVC (3-C)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	1 . . . . 6 . .	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

EVD (3-D)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	. . 3 8	. . . . . .

Port	Latching	Phase Termination
	NO	ADVANCE

INPUTS

Enable	NO
Max ON	
Max OFF	

7 Wire I/C (2-1-5-1)			
Input	Port	Input	Port
RR1		Free	
RR2		D2	
RR3		D3	

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	
Advance Enable	

Cabinet Status (2-1-5-3	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Battery Backup (2-1-5-5)	
Port	Operation
	NORMAL

Y-Coordination (2-1-5-6	
Port C	Port D

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:
- 0 Unused (no output)
- 1-8 Vehicle 1-8
- 9-14 Overlap A-F
- 21-28 Ped 1-8
- 41-47 Special Functions
- 41 Protected Permissive Flashing Phase 1
- 43 Protected Permissive Flashing Phase 3
- 45 Protected Permissive Flashing Phase 5
- 47 Protected Permissive Flashing Phase 7
- 51-57 Special Functions
- 71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6 Channel 9 and 10

INTERVAL CONTROL

Interval Control (3-3-1)	Time
Step 1	
Step 2	
Step 3	
Step 4	
Step 5	
Step 6	
Step 7	
Step 8	

Phase Control (3-3-2)			Phase Recall (3-3-3)			Phase Permitted (3-3-4)		
Hold	Force	Advance	Veh Call	Ped Call	Int Call	Phs Permit	Ped Permit	Ovrlap Permit
....	....	....	....	....	....	....	....	......
....	....	....	....	....	....	....	....	......
....	....	....	....	....	....	....	....	......
....	....	....	....	....	....	....	....	......
....	....	....	....	....	....	....	....	......
....	....	....	....	....	....	....	....	......
....	....	....	....	....	....	....	....	......
....	....	....	....	....	....	....	....	......

Configuration (3-3-5)			
Input	Port	Delay	HRI Cross
1			
2			

HRI

HRI Configuration (3-4)	
RailRoad	51
Line	
Group	

	WAYSIDE	ATC
Subnode		
Device		

TRANSIT PRIORITY

Local Plans (3-E) 1...9 11...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											
Plan 11	Green Factor											
Plan 12	Green Factor											
Plan 13	Green Factor											
Plan 14	Green Factor											
Plan 15	Green Factor											
Plan 16	Green Factor											
Plan 17	Green Factor											
Plan 18	Green Factor											
Plan 19	Green Factor											

Transit Priority Configuration (3-E-A)				Indicator Output	
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	. . . .	0.0	NONE	0	0
Plan 11-19	. . . .	0.0	NONE	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
	. . . .
	. . . .

Free Plans (3-E-E)	
Max Grn Hold	Hold Phase
	. . . .

Access Utilities (9-5)	
Password	***
Timeout	30

YELLOW YIELD COORDINATION

Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	Force-Offs -1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . .	. . . .
Plan D													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . .	. . . .

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
					. . . .	0.0	0.0	0.0	0	0.0	0

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10 HCH By: PMP

T.S. No.: 4028 Date Implemented: ______ By: ______

1. CONFIGURATION SUBMENU

1. CONTROLLER SEQUENCE

PRIORITY	1	2	3	4	5	6	7	8	9	10	11	12
RING 1	1	2	3	4								
RING 2	5	6	7	8								
CG (CONCURRENT GROUPS)		X		X								

2. PHASES IN USE

	PHASE NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
PHASES IN USE	X	X	X	X	X	X	X	X				
EXCLUSIVE PED												

3. PHASE TO LOAD SWITCH (MMU) ASSIGNMENT

LOAD SWITCH (MMU)	SIGNAL DRIVER GROUP		LOAD SWITCH (MMU)	SIGNAL DRIVER GROUP	
CHANNEL	PHASE/OVLP	PED	CHANNEL	PHASE/OVLP	PED
1	1		9	2	X
2	2		10	4	X
3	3		11	6	X
4	4		12	8	X
5	5		13		
6	6		14		
7	7		15		
8	8		16		

4. SDLC OPTIONS/ENABLES

	BIU NUMBER							
	1	2	3	4	5	6	7	8
TERM & FACIL								
DETECTOR RACK								
TYPE 2 RUNS AS TYPE 1								
MMU DISABLE								X
DIAGNOSTIC ENABLE (TEST FIXTURE)								
PEER TO PEER ENABLE								

PEER TO PEER ADDRESS:

1)		2)		3)		4)		5)	
6)		7)		8)		9)		10)	

5. PORT 2 CONFIGURATION

PORT 2 PROTOCOL	
PORT 2 ENABLE	
AB3418 ADDRESS	
AB3418 GROUP ADDRESS	
AB3418 RESPONSE DELAY	
AB3418 SINGLE FLAG ENABLE	
AB3418 DROP-OUT TIME	
AB3418 TOD SF SELECT	
DATA RATE (BPS)	
DATA, PARITY, STOP	

6. PORT 3 CONFIGURATION

PORT 3 PROTOCOL	
PORT 3 ENABLE	
TELEMETRY ADDRESS	
SYSTEM DETECTOR 9-16 ADDRESS	
TELEMETRY RESPONSE DELAY	
AB3418 ADDRESS	
AB3418 GROUP ADDRESS	
AB3418 RESPONSE DELAY	
AB3418 SINGLE FLAG ENABLE	
AB3418 DROP-OUT TIME	
AB3418 TOD SF SELECT	
ADDITIONAL SCREEN(S)	
DUPLEX -- HALF OR FULL	
MODEM DATA RATE (BPS)	
DATA, PARITY, STOP	

LOS ANGELES COUNTY
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1. CONFIGURATION SUBMENU (Continued)

7. ENABLE EVENT LOGS

CRITICAL RFE'S (MMU/TF)	
NON-CRITICAL RFE'S(DET/TEST)	
DETECTOR ERRORS	
COORDINATION ERRORS	
MMU FLASH FAULTS	
LOCAL FLASH FAULTS	
PREEMPT	
POWER ON/OFF	
LOW BATTERY	
SPARE	
ALARM 1	
ALARM 2	
ALARM 3	
ALARM 4	
ALARM 5	
ALARM 6	
ALARM 7	
ALARM 8	
ALARM 9	
ALARM 10	
ALARM 11	
ALARM 12	
ALARM 13	
ALARM 14	
ALARM 15	
ALARM 16	

8. OPTIONS

SUPERVISOR ACCESS CODE	
DATA CHANGE ACCESS CODE	
KEY CLICK ENABLE	
BACKLIGHT ENABLE	

9. MMU PROGRAM CAN SERVE WITH

PHASE	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															

LOS ANGELES COUNTY
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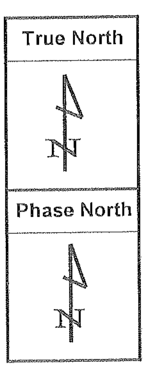
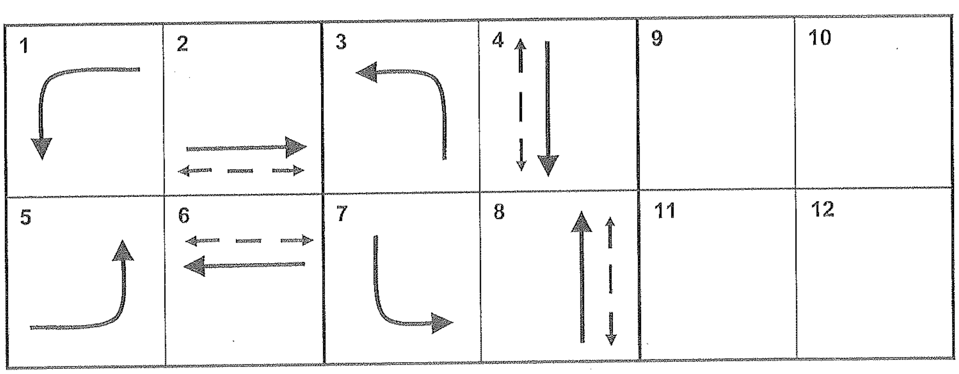
2. CONTROLLER SUBMENU

1. CONTROLLER TIMING DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MIN GREEN	4	6	4	6	4	6	4	6				
BIKE GREEN	0	0	0	0	0	0	0	0				
CS MIN GREEN	0	0	0	0	0	0	0	0				
WALK	0	7	0	7	0	7	0	7				
PED CLEAR	0	19	0	19	0	18	0	18				
VEH EXT	1.5	4.0	1.5	4.0	1.5	4.0	1.5	4.0				
VEH EXT 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
MAX EXT	0	0	0	0	0	0	0	0				
MAX 1	20	50	20	50	20	50	20	50				
MAX 2	20	130	20	50	20	130	20	50				
MAX 3	0	0	0	0	0	0	0	0				
DET MAX	0	0	0	0	0	0	0	0				
YELLOW	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5				
RED CLEAR	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				
RED REVERT	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				
ACT B4	0	0	0	0	0	0	0	0				
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
MAX INITIAL	0	0	0	0	0	0	0	0				
TIME B4 REDUCTION	0	15	0	15	0	15	0	15				
CARS WT	0	255	0	255	0	255	0	255				
TIME TO REDUCE	0	15	0	15	0	15	0	15				
MIN GAP	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0				





COMMENTS:

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

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2. CONTROLLER SUBMENU (Continued)

2. PHASE OVERLAP ASSIGNMENTS

	OVERLAP CONSISTS OF PHASES:											
OVLP PHASE	1	2	3	4	5	6	7	8	9	10	11	12
1	X											
2		X										
3			X									
4				X								
5					X							
6						X						
7							X					
8								X				
9									X			
10										X		
11											X	
12												X

3. PED TIMING CARRYOVER

PHASE	CARRYOVER PHASE	PHASE	CARRYOVER PHASE
1		7	
2		8	
3		9	
4		10	
5		11	
6		12	

4. CONTROLLER RECALL DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
LOCKING MEMORY		X		X		X		X				
VEH RECALL		X				X						
PED RECALL												
RECALL TO MAX												
SOFT RECALL												
DON'T REST HERE												
PED DARK N/CALL												

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T.S. No.: 4028 Date Implemented: ______ By: ______

(NOT USED)

2. CONTROLLER SUBMENU (Continued)

5. CONTROLLER OVERLAP DATA

OVERLAP A	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN												
LAG/LEAD GREEN												
LAG/LEAD YELLOW												
LAG/LEAD RED TIMER												

OVERLAP B	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN												
LAG/LEAD GREEN												
LAG/LEAD YELLOW												
LAG/LEAD RED TIMER												

OVERLAP C	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN												
LAG/LEAD GREEN												
LAG/LEAD YELLOW												
LAG/LEAD RED TIMER												

OVERLAP D	1	2	3	4	5	6	7	8	9	10	11	12
STANDARD												
PROTECTED												
PERMITTED												
ENABLE LAG												
ENABLE LEAD												
SPARE												
ADVANCE GREEN												
LAG/LEAD GREEN												
LAG/LEAD YELLOW												
LAG/LEAD RED TIMER												

PED OVERLAP ASSIGNMENTS
OVERLAP CONSISTS OF PHASES:

OVLP PHASE	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

LOS ANGELES COUNTY
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2. CONTROLLER SUBMENU (Continued)

6. CONTROLLER START/FLASH DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
POWER START		X				X						
EXTERNAL START		X				X						
ENTRY REM FLASH												
EXIT REM FLASH												
REM FLASH YELLOW												
FL TOGETHER PHS												
FL TOGETHER OVLPS	A			B			C			D		

POWER START	YELLOW	
EXTERNAL START	YELLOW	
POWER START ALL RED TIME	0	
POWER START FLASH TIME	0	
REMOTE FLASH OPTIONS:		
OUT OF FLASH YELLOW		
OUT OF FLASH RED		
MINIMUM RECALL		
USE ALTERNATE FLASH		
FLASH THRU LOAD SWITCHES		
CYCLE THROUGH PHASES		
YELLOW FLASH MAIN STREET		

7. NO SERVE PHASE

PHASE	12	11	10	9	8	7	6	5	4	3	2
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											

8. DIMMING

LOAD SWITCH	1	2	3	4	5	6	7	8
DIM GRN/WALK								
DIM YEL/PC								
DIM RED/DW								
LOAD SWITCH	9	10	11	12	13	14	15	16
DIM GRN/WALK								
DIM YEL/PC								
DIM RED/DW								

9. CONTROLLER OPTION DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
GUAR PASSAGE												
NON ACTUATED I												
NON ACTUATED II												
DUAL ENTRY												
COND SERVICE												
COND RESERVICE												
REST IN WALK												
FLASHING WALK												

FIVE SECTION LEFT TURN HEADS
(SPECIAL PROGRAM OPTION FOR STATE OF ILLINOIS)

5 - 2		7 - 4		1 - 6	
3 - 8		11 - 10		9 - 12	

DUAL ENTRY		RESERVED	
COND SERVICE ENABLE		BACKUP PROTECTION GROUP 1	
COND SERVICE DET X SWITCHING		BACKUP PROTECTION GROUP 2	
PED CLEAR PROTECT		BACKUP PROTECTION GROUP 3	
SPEC PREEMPT OVLP FLASH		SIMULTANEOUS GAP GROUP 1	ON
LOCK DETECTORS IN RED ONLY		SIMULTANEOUS GAP GROUP 2	ON
RESERVED		SIMULTANEOUS GAP GROUP 3	

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10 HCH By: DMP

T.S. No.: 4028 Date Implemented: ______ By: ______

3. COORDINATION SUBMENU

TIME OF DAY OPERATION SUMMARY					
PLAN 1	0900 - 1500 M-F 1800 - 2100 M-F	PLAN 4		PLAN 7	
PLAN 2	0600 - 0900 M-F	PLAN 5		PLAN 8	
PLAN 3	1500 - 1800 M-F	PLAN 6		PLAN 9	
FREE	ALL OTHER TIMES				

1. COORDINATOR OPTIONS

SPLIT UNITS	SEC	ACTUATED COORD PHASE(S)	X
OFFSET UNITS	SEC	ACTUATED WALK/REST	
INTERCONNECT FORMAT	STD	INHIBIT MAX	
INTERCONNECT SOURCE	NIC	MAX 2 SELECT	X
RESYNC COUNT	255	MULTISYNC	
TRANSITION	SMOOTH	FLOAT FORCE OFF	
DWELL PERIOD	255		

FREE ALTERNATE SEQUENCE	A	B	C	D	E	F

2. COORD MANUAL AND SPLIT DEMAND

MANUAL ENABLE		MANUAL PATTERN	

SPLIT DEMAND:	DEMAND 1	DEMAND 2
DEMAND CALL TIME	0	0
DEMAND CYCLE COUNT	0	0

DEMAND PHASE	1	2	3	4	5	6	7	8	9	10	11	12
DEMAND 1 PHASE												
DEMAND 2 PHASE												

3. COORD AUTO PERM MIN GREEN

PHASE	AUTO PERM MIN GREEN	PHASE	AUTO PERM MIN GRN
1	7	7	7
2	7	8	7
3	7	9	
4	7	10	
5	7	11	
6	7	12	

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3. COORDINATION SUBMENU (Continued)

4. PATTERN DATA

STD FORMAT

COORD PATTERN	1	OFFSET	5
CYCLE LENGTH	120	C/O/S	1/1/1

PLAN FORMAT

COORD PATTERN		OFFSET	
CYCLE LENGTH		PLAN	

TS2 FORMAT

COORD PATTERN		TIMING PLAN						
CYCLE LENGTH		OFFSETS	1		2		3	

SPLITS							
PHASE 1	19	PHASE 2	15	PHASE 3	16	PHASE 4	38
PHASE 5	19	PHASE 6	15	PHASE 7	16	PHASE 8	38
PHASE 9		PHASE 10		PHASE 11		PHASE 12	

VEH PERMISSIVE	[1]	0	[2]	0
VEH PERM 2 DISP				
PHASE RESERVICE				
SPLIT EXTENSION/RING	[1]	31	[2]	31
SPL DMD PATTERN	[1]		[2]	
XARTERY PATTERN				

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

STD FORMAT

COORD PATTERN	2	OFFSET	5
CYCLE LENGTH	120	C/O/S	2/1/1

PLAN FORMAT

COORD PATTERN		OFFSET	
CYCLE LENGTH		PLAN	

TS2 FORMAT

COORD PATTERN		TIMING PLAN						
CYCLE LENGTH		OFFSETS	1		2		3	

SPLITS							
PHASE 1	16	PHASE 2	15	PHASE 3	16	PHASE 4	38
PHASE 5	16	PHASE 6	15	PHASE 7	16	PHASE 8	38
PHASE 9		PHASE 10		PHASE 11		PHASE 12	

VEH PERMISSIVE	[1]	0	[2]	0
VEH PERM 2 DISP				
PHASE RESERVICE				
SPLIT EXTENSION/RING	[1]	31	[2]	31
SPL DMD PATTERN	[1]		[2]	
XARTERY PATTERN				

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

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3. COORDINATION SUBMENU (Continued)

4. PATTERN DATA (Continued)

STD FORMAT

COORD PATTERN	3	OFFSET	5
CYCLE LENGTH	120	C/O/S	3/1/1

PLAN FORMAT

COORD PATTERN		OFFSET	
CYCLE LENGTH		PLAN	

TS2 FORMAT

COORD PATTERN		TIMING PLAN						
CYCLE LENGTH		OFFSETS	1		2		3	

SPLITS							
PHASE 1	19	PHASE 2	15	PHASE 3	19	PHASE 4	33
PHASE 5	19	PHASE 6	15	PHASE 7	19	PHASE 8	33
PHASE 9		PHASE 10		PHASE 11		PHASE 12	
VEH PERMISSIVE	[1] 0			[2] 0			
VEH PERM 2 DISP							
PHASE RESERVICE							
SPLIT EXTENSION/RING	[1] 33			[2] 33			
SPL DMD PATTERN	[1]			[2]			
XARTERY PATTERN							

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES		X				X						
VEHICLE RECALL		X				X						
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

STD FORMAT

COORD PATTERN		OFFSET	
CYCLE LENGTH		C/O/S	

PLAN FORMAT

COORD PATTERN		OFFSET	
CYCLE LENGTH		PLAN	

TS2 FORMAT

COORD PATTERN		TIMING PLAN						
CYCLE LENGTH		OFFSETS	1		2		3	

SPLITS							
PHASE 1		PHASE 2		PHASE 3		PHASE 4	
PHASE 5		PHASE 6		PHASE 7		PHASE 8	
PHASE 9		PHASE 10		PHASE 11		PHASE 12	
VEH PERMISSIVE	[1]			[2]			
VEH PERM 2 DISP							
PHASE RESERVICE							
SPLIT EXTENSION/RING	[1]			[2]			
SPL DMD PATTERN	[1]			[2]			
XARTERY PATTERN							

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
COORD PHASES												
VEHICLE RECALL												
VEH MAX RECALL												
PED RECALL												
PHASE OMIT												
SPARE												

	A	B	C	D	E	F
ALTERNATE SEQUENCE						

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(NOT USED)

4. PREEMPTOR SUBMENU

1. PRIORITY PREEMPTOR 1

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			

2. PRIORITY PREEMPTOR 2

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

3. PRIORITY PREEMPTOR 3

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

4. PRIORITY PREEMPTOR 4

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

LOS ANGELES COUNTY
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4. PREEMPTOR SUBMENU (Continued)

5. PRIORITY PREEMPTOR 5

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

6. PRIORITY PREEMPTOR 6

	1	2	3	4	5	6	7	8	9	10	11	12
TERM PHASE OVLP												
TRK CLR PHASE												
HOLD PHASES												
EXIT PHASES												
EXIT CALLS												
SPARE												
TERM OVERLAP	A			B			C			D		

ACTIVE		PED DARK	
PRIORITY		PED ACTIVE	
DET LOCK		ZERO PC TIME	
HOLD FLASH		PC THRU YELLOW	
TERM OVLP ASAP		TERM PHASES	
DON'T OVERRIDE FLASH		ACTIVE ONLY DURING HOLD	
FLASH ALL OUTPUTS		NO CVM IN FLASH	
YELLOW-RED GOES GREEN		FAST FLASH GRN ON HOLD	
ENABLE MAX PREEMPT TIME		OUT OF FLASH	
MAX TIME		DURATION TIME	
MIN HOLD TIME		DELAY TIME	
MIN PED CLEAR		INHIBIT TIME	
EXIT MAX		HOLD DELAY TIME	

	GREEN	YELLOW	RED
MINIMUM			
TRACK CLEAR			
HOLD			
LINKED PREEMPTOR			

7. BUS PREEMPTORS

	BUS PREEMPTOR			
	1	2	3	4
PREEMPTOR ACTIVE				
DETECTOR LOCK				
MAXIMUM TIME				
RESERVICE TIME				
DELAY TIME				
INHIBIT TIME				
ENTRANCE GREEN				
ENTRANCE PED CLEAR				
ENTRANCE YELLOW				
ENTRANCE RED				
MIN HOLD TIME				

	HOLD PHASE											
	1	2	3	4	5	6	7	8	9	10	11	12
PREEMPTOR 1												
PREEMPTOR 2												
PREEMPTOR 3												
PREEMPTOR 4												

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5. NIC/TOD SUBMENU

1. NIC/TOD CLOCK/CALENDAR DATA

DATE SET	
TIME SET	
MANUAL NIC PROGRAM STEP	0
MANUAL TOD PROGRAM STEP	0
SYNC REFERENCE TIME	★ ★ 0000
SYNC REFERENCE	REFERENCE TIME
WEEK 1 BEGINS ON 1ST SUNDAY	
DISABLE DAYLIGHT SAVINGS	
DST BEGINS LAST SUNDAY	

2. NIC/TOD WEEKLY PROGRAMS

WEEK	SUN	MON	TUE	WED	THU	FRI	SAT
1	2	1	1	1	1	1	2
2							
3							
4							
5							
6							
7							
8							
9							
10							

3. NIC/TOD YEARLY PROGRAMS

WEEK OF YEAR	1	2	3	4	5	6	7	8
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	9	10	11	12	13	14	15	16
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	17	18	19	20	21	22	23	24
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	25	26	27	28	29	30	31	32
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	33	34	35	36	37	38	39	40
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR	41	42	43	44	45	46	47	48
WEEKLY PROGRAM	1	1	1	1	1	1	1	1
WEEK OF YEAR				49	50	51	52	53
WEEKLY PROGRAM				1	1	1	1	1

4. NIC/TOD HOLIDAY PROGRAM

HOLIDAY	FLOAT/FIXED	MON/MON	DOW/DOM	WOM/YEAR	PROG
1	FIXED	1	1	0	2
2	FIXED	7	4	0	2
3	FIXED	11	11	0	2
4	FIXED	12	24	0	2
5	FIXED	12	25	0	2
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					

★ ★ NOTE: When using RCTB Unit, in order for the controller clock to be properly updated, the RCTB Unit must be designed for a 03:30 AM Sync Pulse.

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5. NIC/TOD SUBMENU (Continued)

5. NIC PROGRAM STEP

STEP	PGM	TIME	PATTERN	OVERRIDE
1	1	0000	0	
2	2	0000	0	
3	1	0600	2	
4	1	0900	1	
5	1	1500	3	
6	1	1800	1	
7	1	2100	0	

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5. NIC/TOD SUBMENU (Continued)

6. TOD PROGRAM STEPS

TOD PROGRAM STEP			
DAY PGM NUMBER			
STEP BEGINS			
FLASH		DIM ENABLE	
RED REST		ALT VEH EXTSN	
SPARE 5		DET LOG ENABLE	
SPARE 3		SPARE 4	
TYPE 0 DELAY ENABLE		SPARE 2	
DET DIAG PLAN			

ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP			
DAY PGM NUMBER			
STEP BEGINS			
FLASH		DIM ENABLE	
RED REST		ALT VEH EXTSN	
SPARE 5		DET LOG ENABLE	
SPARE 3		SPARE 4	
TYPE 0 DELAY ENABLE		SPARE 2	
DET DIAG PLAN			

ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP			
DAY PGM NUMBER			
STEP BEGINS			
FLASH		DIM ENABLE	
RED REST		ALT VEH EXTSN	
SPARE 5		DET LOG ENABLE	
SPARE 3		SPARE 4	
TYPE 0 DELAY ENABLE		SPARE 2	
DET DIAG PLAN			

ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP			
DAY PGM NUMBER			
STEP BEGINS			
FLASH		DIM ENABLE	
RED REST		ALT VEH EXTSN	
SPARE 5		DET LOG ENABLE	
SPARE 3		SPARE 4	
TYPE 0 DELAY ENABLE		SPARE 2	
DET DIAG PLAN			

ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

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5. NIC/TOD SUBMENU (Continued)

6. TOD PROGRAM STEPS (CONTINUED)

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

TOD PROGRAM STEP												
DAY PGM NUMBER												
STEP BEGINS												
FLASH					DIM ENABLE							
RED REST					ALT VEH EXTSN							
SPARE 5					DET LOG ENABLE							
SPARE 3					SPARE 4							
TYPE 0 DELAY ENABLE					SPARE 2							
DET DIAG PLAN												
ALTERNATE SEQUENCE	A		B		C		D		E		F	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MAX 2 ENABLE												
MAX 3 ENABLE												
VEH RECALL												
VEH MAX RECALL												
PED RECALL												
COND SERV INHIBIT												
PHASE OMIT												
SPECIAL FUNCTIONS									(1 - 8)			

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6. DETECTORS SUBMENU

1. DETECTOR TYPE/TIMERS

DETECTOR	TYPE	LOCK	EXTEND	DELAY	NO RESET	LOG ENABLE
1	0					
2	0					
3	0					
4	0					
5	5		2.0			
6	5		2.0			
7	5		2.0			
8	5		2.0			
9	0					
10	0					
11	0					
12	0					
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

2. DETECTOR PHASE ASSIGNMENT

	PHASE ASSIGNMENT											
DETECTOR	1	2	3	4	5	6	7	8	9	10	11	12
1			X									
2							X					
3	X											
4					X							
5				X								
6								X				
7		X										
8						X						
9						X						
10								X				
11		X										
12				X								
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												

3. PED AND SYSTEM DETECTOR LOCAL ASSIGNMENT

DETECTOR LOG INTERVAL					MINUTES	
LOCAL PED DET NUMBER	PHASE PED DETECTOR					
	1	2	3	4	5	6
		2		4		6
	7	8	9	10	11	12
NUMBER		8				
LOCAL PED DET NUMBER	LOCAL SYSTEM DETECTOR NUMBER					
	1	2	3	4	5	6
	7	8	9	10	11	12
NUMBER						

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10HC/+ By: Pmp

T.S. No.: 4028 Date Implemented: ____________ By: ______

(NOT USED)

6. DETECTORS SUBMENU (Continued)

4. CROSS SWITCHING

	PHASES											
DETECTOR	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												

6. VEHICLE DETECTOR DIAGNOSTIC PLAN

PLAN	DET NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	DIAG NO																
	SCALING																
2	DIAG NO																
	SCALING																
3	DIAG NO																
	SCALING																
4	DIAG NO																
	SCALING																
5	DIAG NO																
	SCALING																
6	DIAG NO																
	SCALING																
7	DIAG NO																
	SCALING																
8	DIAG NO																
	SCALING																
FINAL ACTION																	

PLAN	DET NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	DIAG NO																
	SCALING																
2	DIAG NO																
	SCALING																
3	DIAG NO																
	SCALING																
4	DIAG NO																
	SCALING																
5	DIAG NO																
	SCALING																
6	DIAG NO																
	SCALING																
7	DIAG NO																
	SCALING																
8	DIAG NO																
	SCALING																
FINAL ACTION																	

5. SPEED DETECTORS

SPEED DETECTOR NUMBERS	1	2	3	4	5	6	7	8
ONE DETECTOR SPEED:								
LOCAL DET NUMBER								
VEHICLE LENGTH								
LOOP LENGTH								
TWO DETECTOR SPEED:								
LOCAL DET NUMBER								
SPEED TRAP								
ENABLE LOG								
UNITS:								

7. PED DETECTOR DIAGNOSTIC PLAN

PLAN	DET NO.	1	2	3	4	5	6	7	8	9	10	11	12
1	DIAG NO.												
	SCALING												
2	DIAG NO.												
	SCALING												
3	DIAG NO.												
	SCALING												
4	DIAG NO.												
	SCALING												
5	DIAG NO.												
	SCALING												
6	DIAG NO.												
	SCALING												
7	DIAG NO.												
	SCALING												
8	DIAG NO.												
	SCALING												

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10 HcH By: pmp

T.S. No.: 4028 Date Implemented: ______ By: ______

(NOT USED)

6. DETECTORS SUBMENU (Continued)

8. DETECTOR DIAGNOSTIC INTERVAL

DETECTOR DIAGNOSTIC INTERVAL			
DIAGNOSTIC NUMBER	NO ACTIVITY	MAX PRESENCE	ERRATIC COUNTS
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
TRAFFIC SIGNAL TIMING

ASC/2

PROGRAM REFERENCE CARD

INTERSECTION: Carson St. @ Wilmington Ave. Date Prepared: 8-11-10 HCH By: PMP

T.S. No.: 4028 Date Implemented: ______ By: ______

DETECTOR ASSIGNMENT WORK SHEET

LOOP LOCATION	LANE	DET ASSIGN	DET TYP #	PHASE 1	2	3	4	5	6	7	8	9	10	11	12	DET DELAY	DET EXTEND	QUEUE MAX	REMARKS
1-E-Ø1	LT	3	0	X															F
1-W-Ø5	LT	4	0					X											F
1-S-Ø3	LT	1	0			X													F
1-N-Ø7	LT	2	0							X									F
1-W-Ø2	1,2	7	5		X												2.0		Q
1-E-Ø6	1,2	8	5						X								2.0		Q
1-N-Ø4	1,2	5	5				X										2.0		Q
1-S-Ø8	1,2	6	5								X						2.0		Q
2-W-Ø2	1,2	11	0		X														A
2-N-Ø4	1,2	12	0				X												A
2-E-Ø6	1,2	9	0						X										A
2-S-Ø8	1,2	10	0								X								A

DETECTOR ASSIGNMENT DEFINITIONS

CONTROLLER	CONNECTOR'S A,B C								CONNECTOR D								CONNECTOR TELEMETRY								CONNECTOR TYPE 1							
ASC-2	DETECTOR								DETECTOR								DETECTOR								INPUT TYPE 1 ONLY							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

* = DELAY Time or EXTEND Time set on External Sensor

** = When the Detector Input is set to be a TYPE 4 Detector, the EXTEND value set in the Controller becomes the QUEUE MAX value and any Extension Time needed must be set externally on the Sensor. If the Detector Input is set to be a TYPE 5, the EXTEND value becomes a Reset (Gap) Timer value and the Extension Time is set Externally on the Sensor Unit.

Q = QUEUE CLEARING LOOP F = FIRST VEHICLE LOOP
H = HOLDING LOOP A = ADVANCE LOOP

APPENDIX C:
EXISTING TRAFFIC COUNTS

Prepared by National Data & Surveying Services

Avalon Blvd & Carson St

Peak Hour Turning Movement Count

ID: 19-05496-009
City: Carson

Day: Wednesday
Date: 08/28/2019

PEAK HOURS		COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

Avalon Blvd – SOUTHBOUND

	Right	Thru	Left	U-Turn	Approach Total (northbound departure)
AM	113	646	112	1	1000
NOON	0	0	0	0	0
PM	180	890	205	4	995
Lanes	0	3	1	0	

Carson St – EASTBOUND

	AM	NOON	PM
Departure (westbound)	952	0	965
U-Turn (0)	1	0	1
Left (2)	136	0	179
Thru (2)	686	0	818
Right (0)	71	0	104

Carson St – WESTBOUND

	PM	NOON	AM
Right (0)	103	0	108
Thru (2)	685	0	760
Left (2)	331	0	313
U-Turn (0)	11	0	5
Departure (eastbound)	1517	0	1202

Avalon Blvd – NORTHBOUND

	Departure (southbound)	U-Turn	Left	Thru	Right
Lanes		0	1	3	0
PM	1326	1	99	709	483
NOON	0	0	0	0	0
AM	1030	0	78	755	399

CONTROL

Signalized

	AM	NOON	PM
TEV	4184	0	4803
PHF	0.90		0.99

Total Vehicles (AM)

Total Vehicles (AM)

Total Vehicles (NOON)

Total Vehicles (NOON)

Total Vehicles (PM)

Total Vehicles (PM)

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg	0 0	0 0	0 0
South leg	0 0	0 0	0 0
West leg	0 0	0 0	0 0
East leg	0 0	0 0	0 0
NW corner	0	0	0
NE corner	0	0	0
SW corner	0	0	0
SE corner	0	0	0

Prepared by National Data & Surveying Services

I-405 SB Ramps & Carson St

Peak Hour Turning Movement Count

ID: 19-05496-011
City: Carson

Day: Tuesday
Date: 08/27/2019

PEAK HOURS		COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

I-405 SB Ramps — SOUTHBOUND

	Right	Thru	Left	U-Turn	Exit
AM	3	0	0	0	25
NOON	0	0	0	0	0
PM	4	0	0	0	32
Lanes	1	0	0	0	

Carson St — EASTBOUND

	AM	NOON	PM	Lanes
Exit	1255	0	1060	
U-Turn	0	0	3	0
Left	5	0	4	1
Thru	674	0	1203	2
Right	572	0	907	1

Carson St — WESTBOUND

	Lanes	PM	NOON	AM
Left	0	18	0	13
Thru	3	1037	0	1210
Right	1	69	0	70
U-Turn	0	0	0	0
Exit		1265	0	870

I-405 SB Ramps — NORTHBOUND

	Exit	U-Turn	Left	Thru	Right
Lanes		0	1	0	1
PM	976	0	16	10	62
NOON	0	0	0	0	0
AM	642	0	42	7	196

CONTROL

Signalized

	AM	NOON	PM
TEV	2792	0	3333
PHF	0.92		0.95

Total Vehicles (AM)

Total Vehicles (NOON)

Total Vehicles (PM)

Total Vehicles (AM)

Total Vehicles (NOON)

Total Vehicles (PM)

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg	0	0	0
North leg	0	0	0
West leg	0	0	0
West leg	0	0	0
East leg	0	0	0
East leg	0	0	0
South leg	0	0	0
South leg	0	0	0
NW diagonal	0	0	0
NE diagonal	0	0	0
SW diagonal	0	0	0
SE diagonal	0	0	0

Prepared by National Data & Surveying Services

I-405 NB Ramps & Carson St

Peak Hour Turning Movement Count

ID: 19-05496-012
City: Carson

Day: Tuesday
Date: 08/27/2019

	PEAK HOURS	COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

I-405 NB Ramps — SOUTHBOUND

	Right	Through	Left	U-Turn	Departing
AM	465	16	15	1	388
NOON	0	0	0	0	0
PM	524	12	34	3	425
Lanes	1	0.5	0.5	0	

Carson St — EASTBOUND

	AM	NOON	PM	Lanes
Departing	1302	0	1123	
U-Turn	0	0	0	0
Left	104	0	140	1
Through	732	0	1111	2
Right	37	0	29	0

Carson St — WESTBOUND

	Lanes	PM	NOON	AM
Right	1	251	0	282
Through	2	564	0	827
Left	1	28	0	17
U-Turn	0	1	0	0
Departing		1173	0	760

I-405 NB Ramps — NORTHBOUND

	Departing	U-Turn	Left	Through	Right
Lanes		0	0	0.5	0.5
PM	69	0	35	31	27
NOON	0	0	0	0	0
AM	70	0	10	1	13

CONTROL

Signalized

	AM	NOON	PM
TEV	2520	0	2790
PHF	0.91		0.94

Total Vehicles (AM)

Total Vehicles (AM)

Total Vehicles (NOON)

Total Vehicles (NOON)

Total Vehicles (PM)

Total Vehicles (PM)

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North (west side)	0	0	0
North (east side)	0	0	0
West (north side)	0	0	0
West (south side)	0	0	0
East (north side)	0	0	0
East (south side)	0	0	0
South (west side)	0	0	0
South (east side)	0	0	0
NW diagonal	0	0	0
NE diagonal	0	0	0
SW diagonal	0	0	0
SE diagonal	0	0	0

Prepared by National Data & Surveying Services

S Perry St & E Carson St

Peak Hour Turning Movement Count

ID: 21-020357-001
City: Carson

Day: Thursday
Date: 12/9/2021

PEAK HOURS	
AM	07:30 AM - 08:30 AM
NOON	NONE
PM	04:45 PM - 05:45 PM

COUNT PERIODS	
AM	7:00 AM - 09:00 AM
NOON	NONE
PM	4:00 PM - 06:00 PM

S Perry St — SOUTHBOUND

	Right	Through	Left	U-Turn	Departing
AM	80	0	9	0	78
NOON	0	0	0	0	0
PM	86	0	66	1	85
Bikes	0	1	0	0	

E Carson St — EASTBOUND

	AM	NOON	PM	Bikes
Departing	771	0	817	
U-Turn	2	0	6	0
Left	52	0	62	1
Through	636	0	858	2
Right	9	0	4	0

E Carson St — WESTBOUND

	Bikes	PM	NOON	AM
Left	0	22	0	26
Through	2	720	0	685
Right	1	3	0	7
U-Turn	0	1	0	0
Departing		936	0	649

S Perry St — NORTHBOUND

	Departing	U-Turn	Left	Through	Right
Bikes		0	0	1	0
PM	7	0	5	0	11
NOON	0	0	0	0	0
AM	16	0	4	0	4

CONTROL

1-Way Stop(SB)

	AM	NOON	PM
TEV	1514	0	1845
PHF	0.87		0.96

Totals (AM)

Approach	Left	Through	Right
Southbound	9	0	80
Eastbound	52	636	9
Westbound	26	685	7
Northbound	4	0	4

Totals (NOON)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Totals (PM)

Approach	Left	Through	Right
Southbound	66	0	86
Eastbound	62	858	4
Westbound	22	720	3
Northbound	5	0	11

Total Bikes (AM)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	2	0
Westbound	1	1	0
Northbound	0	0	0

Total Bikes (NOON)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Total Bikes (PM)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	1	1	0
Westbound	0	1	0
Northbound	0	0	0

Pedestrians (Crosswalks)

Crosswalk	PM	NOON	AM	AM	NOON	PM
North	0	0	3	4	0	1
West	0	0	0	0	0	0
East	0	0	0	1	0	0
South	1	0	1	6	0	0

Diagonal	PM	NOON	AM
Northwest	0	0	0
Northeast	0	0	0
Southwest	0	0	0
Southeast	0	0	0

Prepared by National Data & Surveying Services

Wilmington Ave & Carson St

Peak Hour Turning Movement Count

ID: Historical
City: Carson

Day: Tuesday
Date: 06/04/2019

	PEAK HOURS	COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Wilmington Ave — SOUTHBOUND

	Right	Through	Left	U-Turn	Total
AM	109	372	138	2	885
NOON	0	0	0	0	0
PM	222	660	209	3	588
Lanes	0	2	1	0	

Carson St — WESTBOUND

Movement	Lanes	PM	NOON	AM
Right	0	114	0	254
Through	2	354	0	427
Left	1	49	0	74
U-Turn	0	0	0	1
Total		1049	0	588

Carson St — EASTBOUND

Movement	AM	NOON	PM	Lanes
Total	595	0	662	
U-Turn	1	0	3	0
Left	168	0	101	1
Through	372	0	742	2
Right	42	0	61	0

Wilmington Ave — NORTHBOUND

	Total	U-Turn	Left	Through	Right
Lanes		0	1	2	0
PM	776	6	83	370	98
NOON	0	0	0	0	0
AM	497	9	58	461	77

CONTROL

Signalized

	AM	NOON	PM
TEV	2565	0	3075
PHF	0.84		0.94

Cars (AM)

Approach			
Southbound	105	293	103
Eastbound	157	361	37
Westbound	228	421	54
Northbound	53	418	62

MT (AM)

Approach			
Southbound	3	44	20
Eastbound	8	11	3
Westbound	17	6	7
Northbound	4	22	6

Cars (NOON)

Approach			
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

MT (NOON)

Approach			
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Cars (PM)

Approach			
Southbound	217	602	187
Eastbound	88	729	58
Westbound	90	345	33
Northbound	80	270	81

MT (PM)

Approach			
Southbound	1	26	8
Eastbound	8	12	3
Westbound	17	4	4
Northbound	2	40	10

Pedestrians (Crosswalks)

Crosswalk	Side	PM	NOON	AM
North	West half	1	0	1
North	East half	1	0	0
West	North half	2	0	1
West	South half	0	0	2
East	North half	1	0	0
East	South half	1	0	0
South	West half	1	0	0
South	East half	1	0	0
NW diagonal		0	0	0
NE diagonal		0	0	0
SW diagonal		0	0	0
SE diagonal		0	0	0

APPENDIX D:
LOS ANALYSIS SHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	686	71	318	760	108	78	755	399	112	646	113
Future Volume (veh/h)	136	686	71	318	760	108	78	755	399	112	646	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	151	762	79	353	844	120	87	839	443	124	718	126
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	210	948	98	412	1093	155	110	1182	551	151	1621	282
Arrive On Green	0.06	0.29	0.29	0.12	0.35	0.35	0.06	0.35	0.35	0.08	0.37	0.37
Sat Flow, veh/h	3456	3250	337	3456	3123	444	1781	3404	1585	1781	4377	760
Grp Volume(v), veh/h	151	417	424	353	480	484	87	839	443	124	557	287
Grp Sat Flow(s),veh/h/ln	1728	1777	1810	1728	1777	1790	1781	1702	1585	1781	1702	1733
Q Serve(g_s), s	4.9	24.8	24.9	11.5	27.6	27.6	5.5	24.4	29.0	7.8	14.1	14.3
Cycle Q Clear(g_c), s	4.9	24.8	24.9	11.5	27.6	27.6	5.5	24.4	29.0	7.8	14.1	14.3
Prop In Lane	1.00		0.19	1.00		0.25	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	210	518	528	412	622	627	110	1182	551	151	1260	642
V/C Ratio(X)	0.72	0.80	0.80	0.86	0.77	0.77	0.79	0.71	0.80	0.82	0.44	0.45
Avail Cap(c_a), veh/h	498	690	703	498	690	696	257	1323	616	257	1323	674
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	37.5	37.5	49.5	33.2	33.2	53.0	32.4	33.9	51.6	27.2	27.2
Incr Delay (d2), s/veh	1.7	6.0	5.9	10.5	5.4	5.4	4.7	1.8	7.6	4.2	0.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	11.3	11.5	5.5	12.3	12.4	2.6	10.1	12.0	3.6	5.7	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	43.5	43.5	60.0	38.5	38.5	57.7	34.2	41.4	55.8	27.5	27.9
LnGrp LOS	D	D	D	E	D	D	E	C	D	E	C	C
Approach Vol, veh/h		992			1317			1369			968	
Approach Delay, s/veh		45.2			44.3			38.0			31.2	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	45.6	13.2	45.3	17.1	38.9	10.6	47.9
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	6.9	29.6	9.8	31.0	13.5	26.9	7.5	16.3
Green Ext Time (p_c), s	0.1	6.9	0.0	8.8	0.2	6.5	0.0	8.5

Intersection Summary	
HCM 6th Ctrl Delay	39.9
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	674	572	70	1210	0	42	0	196	0	0	0
Future Volume (veh/h)	5	674	572	70	1210	0	42	0	196	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	5	733	622	76	1315	0	46	0	213			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	315	1999	1141	198	3706	0	281	0	250			
Arrive On Green	0.56	0.56	0.56	0.22	1.00	0.00	0.16	0.00	0.16			
Sat Flow, veh/h	418	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	5	733	622	76	1315	0	46	0	213			
Grp Sat Flow(s),veh/h/ln	418	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.5	10.2	16.3	3.3	0.0	0.0	2.0	0.0	11.8			
Cycle Q Clear(g_c), s	0.5	10.2	16.3	3.3	0.0	0.0	2.0	0.0	11.8			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	315	1999	1141	198	3706	0	281	0	250			
V/C Ratio(X)	0.02	0.37	0.55	0.38	0.35	0.00	0.16	0.00	0.85			
Avail Cap(c_a), veh/h	315	1999	1141	303	3706	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.80	0.80	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.7	10.9	5.8	32.4	0.0	0.0	32.8	0.0	36.9			
Incr Delay (d2), s/veh	0.1	0.5	1.9	0.7	0.2	0.0	0.3	0.0	13.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	3.6	4.8	1.3	0.1	0.0	0.9	0.0	5.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.8	11.4	7.7	33.1	0.2	0.0	33.1	0.0	50.3			
LnGrp LOS	A	B	A	C	A	A	C	A	D			
Approach Vol, veh/h		1360			1391			259				
Approach Delay, s/veh		9.7			2.0			47.2				
Approach LOS		A			A			D				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.7	56.0				70.7		19.3				
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1				
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9				
Max Q Clear Time (g_c+I1), s	5.3	18.3				2.0		13.8				
Green Ext Time (p_c), s	0.1	10.8				19.2		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			9.4									
HCM 6th LOS			A									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	732	37	17	827	282	10	1	13	15	16	465
Future Volume (veh/h)	104	732	37	17	827	282	10	1	13	15	16	465
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	804	41	19	909	310	11	1	14	16	18	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	186	2832	1263	497	2275	1015	192	14	137	107	97	
Arrive On Green	0.21	1.00	1.00	0.64	0.64	0.64	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1781	3554	1585	652	3554	1585	1333	165	1585	558	1124	1585
Grp Volume(v), veh/h	114	804	41	19	909	310	12	0	14	34	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	652	1777	1585	1498	0	1585	1682	0	1585
Q Serve(g_s), s	5.2	0.0	0.0	1.0	11.1	7.9	0.0	0.0	0.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	0.0	1.0	11.1	7.9	0.5	0.0	0.7	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.92		1.00	0.47		1.00
Lane Grp Cap(c), veh/h	186	2832	1263	497	2275	1015	206	0	137	204	0	
V/C Ratio(X)	0.61	0.28	0.03	0.04	0.40	0.31	0.06	0.00	0.10	0.17	0.00	
Avail Cap(c_a), veh/h	501	2832	1263	497	2275	1015	398	0	350	422	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.9	0.0	0.0	6.0	7.8	7.2	37.8	0.0	37.9	38.3	0.0	0.0
Incr Delay (d2), s/veh	2.2	0.2	0.0	0.1	0.5	0.8	0.1	0.0	0.3	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.1	0.0	0.1	3.6	2.4	0.2	0.0	0.3	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	0.2	0.0	6.1	8.4	8.0	37.9	0.0	38.2	38.6	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		959			1238			26			34	A
Approach Delay, s/veh		4.5			8.2			38.1			38.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		77.1		12.9	14.1	63.0		12.9
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9
Max Q Clear Time (g_c+I1), s		2.0		3.5	7.2	13.1		2.7
Green Ext Time (p_c), s		9.8		0.1	0.2	9.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		7.5
HCM 6th LOS		A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	78	123	0
Future Vol, veh/h	0	0	0	78	123	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	85	134	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	219	134	134	0	-	0
Stage 1	134	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	769	915	1451	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	769	915	1451	-	-	-
Mov Cap-2 Maneuver	769	-	-	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	938	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1451	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	52	636	9	7	979	26	6	0	4	9	0	114
Future Vol, veh/h	52	636	9	7	979	26	6	0	4	9	0	114
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	60	731	10	8	1125	30	7	0	5	10	0	131

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1155	0	0	741	0	0	1435	2027	371	1642	2017	578
Stage 1	-	-	-	-	-	-	856	856	-	1156	1156	-
Stage 2	-	-	-	-	-	-	579	1171	-	486	861	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	601	-	-	1173	-	-	159	67	*838	*101	67	459
Stage 1	-	-	-	-	-	-	583	552	-	*209	269	-
Stage 2	-	-	-	-	-	-	468	265	-	*790	549	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	601	-	-	1173	-	-	104	59	*838	*93	60	459
Mov Cap-2 Maneuver	-	-	-	-	-	-	104	59	-	*93	60	-
Stage 1	-	-	-	-	-	-	525	497	-	*188	267	-
Stage 2	-	-	-	-	-	-	332	263	-	*707	494	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.1	29.2	18.3
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	160	601	-	-	1173	-	-	93	459
HCM Lane V/C Ratio	0.072	0.099	-	-	0.007	-	-	0.111	0.285
HCM Control Delay (s)	29.2	11.7	-	-	8.1	-	-	48.5	15.9
HCM Lane LOS	D	B	-	-	A	-	-	E	C
HCM 95th %tile Q(veh)	0.2	0.3	-	-	0	-	-	0.4	1.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	372	42	74	427	254	67	461	77	140	372	109
Future Volume (veh/h)	168	372	42	74	427	254	67	461	77	140	372	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	200	443	50	88	508	302	80	549	92	167	443	130
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	237	1226	547	113	978	436	103	833	371	203	1033	461
Arrive On Green	0.14	0.35	0.35	0.06	0.28	0.28	0.06	0.24	0.24	0.12	0.30	0.30
Sat Flow, veh/h	1753	3497	1560	1753	3497	1560	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	200	443	50	88	508	302	80	549	92	167	443	130
Grp Sat Flow(s),veh/h/ln	1753	1749	1560	1753	1749	1560	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	9.1	7.7	1.8	4.1	10.1	14.2	3.7	11.6	3.9	7.6	8.4	5.3
Cycle Q Clear(g_c), s	9.1	7.7	1.8	4.1	10.1	14.2	3.7	11.6	3.9	7.6	8.4	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	1226	547	113	978	436	103	833	371	203	1033	461
V/C Ratio(X)	0.84	0.36	0.09	0.78	0.52	0.69	0.78	0.66	0.25	0.82	0.43	0.28
Avail Cap(c_a), veh/h	342	1895	845	342	1895	845	342	1895	845	342	1895	845
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	19.8	17.9	37.8	24.9	26.4	38.1	28.3	25.3	35.5	23.3	22.2
Incr Delay (d2), s/veh	8.7	0.3	0.1	4.4	0.6	2.8	4.7	1.3	0.5	3.2	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	3.0	0.6	1.8	4.0	5.2	1.7	4.7	1.4	3.3	3.3	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.3	20.1	18.0	42.2	25.5	29.2	42.9	29.5	25.8	38.7	23.7	22.7
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		693			898			721			740	
Approach Delay, s/veh		26.6			28.4			30.5			26.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.3	34.3	8.8	29.7	15.1	28.5	13.5	25.0
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	6.1	9.7	5.7	10.4	11.1	16.2	9.6	13.6
Green Ext Time (p_c), s	0.0	4.6	0.0	5.0	0.1	6.8	0.1	5.9

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	151	841	353	964	87	1282	124	844
v/c Ratio	0.57	0.82	0.83	0.81	0.60	0.81	0.70	0.51
Control Delay	67.0	48.1	71.9	43.9	75.8	41.1	78.6	33.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.0	48.1	71.9	43.9	75.8	41.1	78.6	33.7
Queue Length 50th (ft)	65	349	154	387	73	335	104	197
Queue Length 95th (ft)	106	444	#250	511	134	431	179	268
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	466	1240	466	1287	240	1770	240	1827
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.68	0.76	0.75	0.36	0.72	0.52	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	5	733	622	76	1315	46	213
v/c Ratio	0.02	0.34	0.44	0.37	0.35	0.21	0.55
Control Delay	9.6	9.9	1.3	39.6	3.6	36.8	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	9.9	1.3	39.6	3.6	36.8	11.0
Queue Length 50th (ft)	1	99	1	43	66	24	0
Queue Length 95th (ft)	7	169	22	m79	76	53	59
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	228	2126	1478	300	3725	391	515
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.34	0.42	0.25	0.35	0.12	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	114	804	41	19	909	310	12	14	34	511
v/c Ratio	0.50	0.32	0.03	0.05	0.45	0.29	0.06	0.05	0.15	0.77
Control Delay	50.5	2.0	0.4	12.2	13.0	3.1	31.4	0.3	33.5	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	2.0	0.4	12.2	13.0	3.1	31.4	0.3	33.5	11.9
Queue Length 50th (ft)	53	10	0	4	134	5	6	0	18	0
Queue Length 95th (ft)	125	54	1	20	262	54	20	0	40	87
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2540	1186	384	2032	1056	328	417	361	748
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	0.32	0.03	0.05	0.45	0.29	0.04	0.03	0.09	0.68

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	200	443	50	88	508	302	80	549	92	167	443	130
v/c Ratio	0.67	0.38	0.09	0.53	0.62	0.50	0.51	0.66	0.21	0.66	0.40	0.22
Control Delay	51.9	27.4	2.5	55.5	36.2	6.9	55.4	37.4	8.0	54.0	28.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	27.4	2.5	55.5	36.2	6.9	55.4	37.4	8.0	54.0	28.3	6.2
Queue Length 50th (ft)	114	110	0	51	144	0	47	157	0	94	110	0
Queue Length 95th (ft)	#233	169	8	103	201	49	96	218	33	176	168	36
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	300	1670	789	300	1670	904	300	1670	794	300	1670	814
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.27	0.06	0.29	0.30	0.33	0.27	0.33	0.12	0.56	0.27	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	818	104	342	685	103	99	709	483	209	890	180
Future Volume (veh/h)	179	818	104	342	685	103	99	709	483	209	890	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	181	826	105	345	692	104	100	716	488	211	899	182
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	948	121	393	1070	161	123	1119	521	220	1634	329
Arrive On Green	0.07	0.30	0.30	0.11	0.35	0.35	0.07	0.33	0.33	0.12	0.38	0.38
Sat Flow, veh/h	3456	3171	403	3456	3098	465	1781	3404	1585	1781	4261	859
Grp Volume(v), veh/h	181	463	468	345	397	399	100	716	488	211	717	364
Grp Sat Flow(s),veh/h/ln	1728	1777	1798	1728	1777	1787	1781	1702	1585	1781	1702	1716
Q Serve(g_s), s	6.9	33.0	33.0	13.1	25.1	25.2	7.4	23.9	39.9	15.7	22.0	22.1
Cycle Q Clear(g_c), s	6.9	33.0	33.0	13.1	25.1	25.2	7.4	23.9	39.9	15.7	22.0	22.1
Prop In Lane	1.00		0.22	1.00		0.26	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	233	531	537	393	614	617	123	1119	521	220	1305	658
V/C Ratio(X)	0.78	0.87	0.87	0.88	0.65	0.65	0.81	0.64	0.94	0.96	0.55	0.55
Avail Cap(c_a), veh/h	427	592	599	427	614	617	220	1134	528	220	1305	658
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.3	44.4	44.4	58.2	36.8	36.8	61.3	38.1	43.5	58.2	32.2	32.2
Incr Delay (d2), s/veh	2.1	13.0	12.9	16.3	2.7	2.7	4.9	1.4	24.5	48.5	0.6	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	16.1	16.3	6.5	11.1	11.2	3.5	10.1	18.9	10.0	9.1	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.4	57.4	57.3	74.5	39.5	39.5	66.2	39.5	68.0	106.7	32.8	33.5
LnGrp LOS	E	E	E	E	D	D	E	D	E	F	C	C
Approach Vol, veh/h		1112			1141			1304			1292	
Approach Delay, s/veh		58.3			50.1			52.2			45.1	
Approach LOS		E			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	51.6	20.0	49.4	18.7	45.4	12.7	56.7				
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5				
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5				
Max Q Clear Time (g_c+I1), s	8.9	27.2	17.7	41.9	15.1	35.0	9.4	24.1				
Green Ext Time (p_c), s	0.1	6.1	0.0	2.0	0.1	5.0	0.0	9.7				
Intersection Summary												
HCM 6th Ctrl Delay			51.2									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1203	907	69	1037	0	16	0	62	0	0	0
Future Volume (veh/h)	7	1203	907	69	1037	0	16	0	62	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	7	1266	955	73	1092	0	17	0	65			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	402	2215	1141	198	4016	0	172	0	153			
Arrive On Green	0.62	0.62	0.62	0.22	1.00	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	516	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	7	1266	955	73	1092	0	17	0	65			
Grp Sat Flow(s),veh/h/ln	516	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.5	18.8	38.2	3.1	0.0	0.0	0.8	0.0	3.5			
Cycle Q Clear(g_c), s	0.5	18.8	38.2	3.1	0.0	0.0	0.8	0.0	3.5			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	402	2215	1141	198	4016	0	172	0	153			
V/C Ratio(X)	0.02	0.57	0.84	0.37	0.27	0.00	0.10	0.00	0.42			
Avail Cap(c_a), veh/h	402	2215	1141	303	4016	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.82	0.82	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	6.5	9.9	8.9	32.3	0.0	0.0	37.1	0.0	38.3			
Incr Delay (d2), s/veh	0.1	1.1	7.4	0.7	0.1	0.0	0.2	0.0	1.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	6.3	12.2	1.3	0.1	0.0	0.3	0.0	1.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.6	11.0	16.2	33.0	0.1	0.0	37.3	0.0	40.1			
LnGrp LOS	A	B	B	C	A	A	D	A	D			
Approach Vol, veh/h		2228			1165			82				
Approach Delay, s/veh		13.2			2.2			39.5				
Approach LOS		B			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.7	61.5				76.2		13.8				
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1				
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9				
Max Q Clear Time (g_c+I1), s	5.1	40.2				2.0		5.5				
Green Ext Time (p_c), s	0.1	0.0				14.4		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		10.2
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	1111	29	28	564	251	35	31	27	37	12	524
Future Volume (veh/h)	140	1111	29	28	564	251	35	31	27	37	12	524
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	149	1182	31	30	600	267	37	33	29	39	13	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	2753	1228	363	2182	973	141	107	172	149	40	
Arrive On Green	0.22	1.00	1.00	0.61	0.61	0.61	0.11	0.11	0.11	0.11	0.11	0.00
Sat Flow, veh/h	1781	3554	1585	460	3554	1585	736	990	1585	732	372	1585
Grp Volume(v), veh/h	149	1182	31	30	600	267	70	0	29	52	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	460	1777	1585	1726	0	1585	1104	0	1585
Q Serve(g_s), s	7.1	0.0	0.0	2.4	7.1	7.0	0.0	0.0	1.5	2.2	0.0	0.0
Cycle Q Clear(g_c), s	7.1	0.0	0.0	2.4	7.1	7.0	3.2	0.0	1.5	5.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.53		1.00	0.75		1.00
Lane Grp Cap(c), veh/h	193	2753	1228	363	2182	973	249	0	172	190	0	
V/C Ratio(X)	0.77	0.43	0.03	0.08	0.27	0.27	0.28	0.00	0.17	0.27	0.00	
Avail Cap(c_a), veh/h	501	2753	1228	363	2182	973	427	0	350	352	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.2	0.0	0.0	7.2	8.1	8.1	37.2	0.0	36.4	38.6	0.0	0.0
Incr Delay (d2), s/veh	3.8	0.4	0.0	0.4	0.3	0.7	0.6	0.0	0.5	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.1	0.0	0.2	2.4	2.2	1.5	0.0	0.6	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	0.4	0.0	7.6	8.4	8.8	37.8	0.0	36.9	39.4	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1362			897			99			52	A
Approach Delay, s/veh		4.5			8.5			37.5			39.4	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		75.1		14.9	14.5	60.7		14.9				
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1				
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9				
Max Q Clear Time (g_c+I1), s		2.0		7.4	9.1	9.1		5.2				
Green Ext Time (p_c), s		17.4		0.1	0.2	7.2		0.3				

Intersection Summary			
HCM 6th Ctrl Delay			8.1
HCM 6th LOS			A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	102	152	0
Future Vol, veh/h	0	0	0	102	152	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	111	165	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	276	165	165	0	-	0
Stage 1	165	-	-	-	-	-
Stage 2	111	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	714	879	1413	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	714	879	1413	-	-	-
Mov Cap-2 Maneuver	714	-	-	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	914	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	0		0		0	
HCM LOS	A					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1413	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	1073	5	3	720	22	5	0	11	66	0	86
Future Vol, veh/h	85	1073	5	3	720	22	5	0	11	66	0	86
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	89	1118	5	3	750	23	5	0	11	69	0	90

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	773	0	0	1123	0	0	1680	2078	562	1505	2069	387
Stage 1	-	-	-	-	-	-	1299	1299	-	768	768	-
Stage 2	-	-	-	-	-	-	381	779	-	737	1301	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	838	-	-	*999	-	-	154	74	*668	*247	76	611
Stage 1	-	-	-	-	-	-	457	435	-	*360	409	-
Stage 2	-	-	-	-	-	-	613	404	-	*629	433	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	838	-	-	*999	-	-	121	66	*668	*223	68	611
Mov Cap-2 Maneuver	-	-	-	-	-	-	121	66	-	*223	68	-
Stage 1	-	-	-	-	-	-	409	388	-	*322	408	-
Stage 2	-	-	-	-	-	-	522	403	-	*553	387	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	18.8	19
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	277	838	-	-	* 999	-	-	223	611
HCM Lane V/C Ratio	0.06	0.106	-	-	0.003	-	-	0.308	0.147
HCM Control Delay (s)	18.8	9.8	-	-	8.6	-	-	28.2	11.9
HCM Lane LOS	C	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.2	0.4	-	-	0	-	-	1.3	0.5

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	742	61	49	354	114	89	370	98	212	660	222
Future Volume (veh/h)	104	742	61	49	354	114	89	370	98	212	660	222
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	111	789	65	52	377	121	95	394	104	226	702	236
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	141	1151	513	65	1000	446	121	799	357	265	1087	485
Arrive On Green	0.08	0.33	0.33	0.04	0.29	0.29	0.07	0.23	0.23	0.15	0.31	0.31
Sat Flow, veh/h	1739	3469	1547	1739	3469	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	111	789	65	52	377	121	95	394	104	226	702	236
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1739	1735	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	4.8	15.1	2.2	2.3	6.7	4.6	4.1	7.6	4.3	9.7	13.4	9.5
Cycle Q Clear(g_c), s	4.8	15.1	2.2	2.3	6.7	4.6	4.1	7.6	4.3	9.7	13.4	9.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	141	1151	513	65	1000	446	121	799	357	265	1087	485
V/C Ratio(X)	0.79	0.69	0.13	0.80	0.38	0.27	0.78	0.49	0.29	0.85	0.65	0.49
Avail Cap(c_a), veh/h	363	2013	898	363	2013	898	363	2013	898	363	2013	898
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	22.2	17.9	36.6	21.8	21.1	35.1	25.6	24.3	31.7	22.7	21.3
Incr Delay (d2), s/veh	3.7	1.0	0.2	8.0	0.3	0.5	4.1	0.7	0.6	10.4	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.7	0.8	1.1	2.5	1.6	1.8	3.0	1.5	4.6	5.1	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	23.2	18.0	44.6	22.1	21.5	39.2	26.3	25.0	42.0	23.6	22.4
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		965			550			593			1164	
Approach Delay, s/veh		24.6			24.1			28.1			26.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	30.9	9.3	29.5	10.2	27.6	15.7	23.2
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	4.3	17.1	6.1	15.4	6.8	8.7	11.7	9.6
Green Ext Time (p_c), s	0.0	8.4	0.0	8.7	0.0	4.3	0.1	4.4

Intersection Summary		
HCM 6th Ctrl Delay		26.0
HCM 6th LOS		C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	181	931	345	796	100	1204	211	1081
v/c Ratio	0.64	0.88	0.86	0.68	0.66	0.88dr	0.94	0.64
Control Delay	70.0	53.6	78.2	40.3	79.9	42.4	105.1	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.0	53.6	78.2	40.3	79.9	42.4	105.1	38.2
Queue Length 50th (ft)	82	411	159	311	89	328	~194	291
Queue Length 95th (ft)	122	506	#241	406	148	387	#368	362
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	435	1155	435	1215	224	1662	224	1707
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.81	0.79	0.66	0.45	0.72	0.94	0.63

Intersection Summary

~ 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.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	7	1266	955	73	1092	17	65
v/c Ratio	0.02	0.61	0.68	0.36	0.30	0.07	0.22
Control Delay	10.7	14.2	4.1	47.6	3.3	32.2	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	14.2	4.1	47.6	3.3	32.2	6.2
Queue Length 50th (ft)	1	215	40	43	32	9	0
Queue Length 95th (ft)	10	388	114	m75	93	25	22
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	283	2091	1470	300	3669	391	417
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.61	0.65	0.24	0.30	0.04	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	149	1182	31	30	600	267	70	29	52	557
v/c Ratio	0.59	0.47	0.03	0.12	0.32	0.27	0.32	0.10	0.26	0.79
Control Delay	54.5	3.5	1.1	15.1	13.3	2.9	37.0	0.6	35.8	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	3.5	1.1	15.1	13.3	2.9	37.0	0.6	35.8	12.2
Queue Length 50th (ft)	92	63	0	7	84	0	38	0	28	1
Queue Length 95th (ft)	m154	74	m1	31	171	45	68	0	55	94
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2535	1181	241	1859	982	339	420	308	784
Starvation Cap Reductn	0	147	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	0.30	0.49	0.03	0.12	0.32	0.27	0.21	0.07	0.17	0.71

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	111	789	65	52	377	121	95	394	104	226	702	236
v/c Ratio	0.59	0.71	0.12	0.40	0.41	0.24	0.55	0.47	0.23	0.76	0.59	0.37
Control Delay	60.7	34.8	4.6	60.0	32.3	7.4	60.1	33.9	7.6	61.2	32.4	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.7	34.8	4.6	60.0	32.3	7.4	60.1	33.9	7.6	61.2	32.4	13.2
Queue Length 50th (ft)	66	223	0	31	97	0	56	108	0	135	196	37
Queue Length 95th (ft)	158	388	23	88	183	47	138	185	42	#393	343	124
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	299	1662	786	299	1662	806	299	1662	797	299	1662	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.47	0.08	0.17	0.23	0.15	0.32	0.24	0.13	0.76	0.42	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	705	72	327	780	112	80	770	409	117	659	115
Future Volume (veh/h)	139	705	72	327	780	112	80	770	409	117	659	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	783	80	363	867	124	89	856	454	130	732	128
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	211	958	98	419	1105	158	112	1175	547	156	1621	281
Arrive On Green	0.06	0.29	0.29	0.12	0.35	0.35	0.06	0.35	0.35	0.09	0.37	0.37
Sat Flow, veh/h	3456	3255	332	3456	3121	446	1781	3404	1585	1781	4379	758
Grp Volume(v), veh/h	154	427	436	363	494	497	89	856	454	130	567	293
Grp Sat Flow(s),veh/h/ln	1728	1777	1811	1728	1777	1790	1781	1702	1585	1781	1702	1734
Q Serve(g_s), s	5.2	26.5	26.6	12.2	29.5	29.5	5.9	26.1	31.2	8.5	15.0	15.2
Cycle Q Clear(g_c), s	5.2	26.5	26.6	12.2	29.5	29.5	5.9	26.1	31.2	8.5	15.0	15.2
Prop In Lane	1.00		0.18	1.00		0.25	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	211	523	533	419	629	634	112	1175	547	156	1260	642
V/C Ratio(X)	0.73	0.82	0.82	0.87	0.78	0.78	0.79	0.73	0.83	0.83	0.45	0.46
Avail Cap(c_a), veh/h	480	666	679	480	666	671	248	1276	594	248	1276	650
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.8	38.9	38.9	51.2	34.3	34.3	54.9	34.0	35.7	53.3	28.3	28.3
Incr Delay (d2), s/veh	1.8	7.1	7.0	12.8	6.3	6.2	4.7	2.2	9.6	6.6	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	12.2	12.5	5.9	13.4	13.4	2.8	10.9	13.2	4.1	6.1	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.6	46.1	46.0	64.0	40.6	40.5	59.6	36.2	45.3	59.9	28.6	29.1
LnGrp LOS	E	D	D	E	D	D	E	D	D	E	C	C
Approach Vol, veh/h		1017			1354			1399			990	
Approach Delay, s/veh		47.6			46.8			40.6			32.9	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	47.6	13.9	46.5	17.9	40.4	11.0	49.4
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	7.2	31.5	10.5	33.2	14.2	28.6	7.9	17.2
Green Ext Time (p_c), s	0.1	6.5	0.0	7.8	0.1	6.4	0.0	8.6

Intersection Summary	
HCM 6th Ctrl Delay	42.3
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	700	583	78	1245	0	43	0	212	0	0	0
Future Volume (veh/h)	5	700	583	78	1245	0	43	0	212	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	5	761	634	85	1353	0	47	0	230			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	302	1962	1141	198	3653	0	299	0	266			
Arrive On Green	0.55	0.55	0.55	0.22	1.00	0.00	0.17	0.00	0.17			
Sat Flow, veh/h	403	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	5	761	634	85	1353	0	47	0	230			
Grp Sat Flow(s),veh/h/ln	403	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.5	11.0	16.8	3.7	0.0	0.0	2.0	0.0	12.7			
Cycle Q Clear(g_c), s	0.5	11.0	16.8	3.7	0.0	0.0	2.0	0.0	12.7			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	302	1962	1141	198	3653	0	299	0	266			
V/C Ratio(X)	0.02	0.39	0.56	0.43	0.37	0.00	0.16	0.00	0.86			
Avail Cap(c_a), veh/h	302	1962	1141	303	3653	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	9.1	11.5	5.9	32.5	0.0	0.0	32.0	0.0	36.4			
Incr Delay (d2), s/veh	0.1	0.6	2.0	0.9	0.2	0.0	0.2	0.0	15.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	4.0	5.0	1.5	0.1	0.0	0.9	0.0	6.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.2	12.1	7.8	33.4	0.2	0.0	32.2	0.0	52.2			
LnGrp LOS	A	B	A	C	A	A	C	A	D			
Approach Vol, veh/h		1400			1438			277				
Approach Delay, s/veh		10.1			2.2			48.8				
Approach LOS		B			A			D				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.7	55.1				69.8		20.2				
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1				
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9				
Max Q Clear Time (g_c+I1), s	5.7	18.8				2.0		14.7				
Green Ext Time (p_c), s	0.1	11.0				20.1		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			9.9									
HCM 6th LOS			A									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	771	38	17	861	299	10	1	13	23	16	474
Future Volume (veh/h)	106	771	38	17	861	299	10	1	13	23	16	474
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	116	847	42	19	946	329	11	1	14	25	18	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	187	2815	1255	477	2256	1006	200	15	145	132	79	
Arrive On Green	0.21	1.00	1.00	0.63	0.63	0.63	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1781	3554	1585	625	3554	1585	1352	164	1585	754	862	1585
Grp Volume(v), veh/h	116	847	42	19	946	329	12	0	14	43	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	625	1777	1585	1516	0	1585	1616	0	1585
Q Serve(g_s), s	5.3	0.0	0.0	1.0	11.9	8.6	0.0	0.0	0.7	0.6	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	0.0	1.0	11.9	8.6	0.5	0.0	0.7	2.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.92		1.00	0.58		1.00
Lane Grp Cap(c), veh/h	187	2815	1255	477	2256	1006	215	0	145	211	0	
V/C Ratio(X)	0.62	0.30	0.03	0.04	0.42	0.33	0.06	0.00	0.10	0.20	0.00	
Avail Cap(c_a), veh/h	501	2815	1255	477	2256	1006	400	0	350	414	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.9	0.0	0.0	6.2	8.2	7.6	37.4	0.0	37.5	38.0	0.0	0.0
Incr Delay (d2), s/veh	2.3	0.3	0.0	0.2	0.6	0.9	0.1	0.0	0.3	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.1	0.0	0.1	3.9	2.6	0.2	0.0	0.3	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	0.3	0.0	6.3	8.8	8.4	37.5	0.0	37.8	38.5	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1005			1294			26			43	A
Approach Delay, s/veh		4.4			8.6			37.7			38.5	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		76.7		13.3	14.1	62.5		13.3
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9
Max Q Clear Time (g_c+I1), s		2.0		4.0	7.3	13.9		2.7
Green Ext Time (p_c), s		10.6		0.1	0.2	9.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		7.7
HCM 6th LOS		A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	37	42	80	126	7
Future Vol, veh/h	7	37	42	80	126	7
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	40	46	87	137	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	320	141	145	0	-	0
Stage 1	141	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	673	907	1437	-	-	-
Stage 1	886	-	-	-	-	-
Stage 2	852	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	650	907	1437	-	-	-
Mov Cap-2 Maneuver	650	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1437	-	853	-	-
HCM Lane V/C Ratio	0.032	-	0.056	-	-
HCM Control Delay (s)	7.6	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	649	9	7	998	36	6	0	4	18	0	145
Future Vol, veh/h	85	649	9	7	998	36	6	0	4	18	0	145
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	98	746	10	8	1147	41	7	0	5	21	0	167

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1188	0	0	756	0	0	1537	2151	378	1753	2136	594
Stage 1	-	-	-	-	-	-	947	947	-	1184	1184	-
Stage 2	-	-	-	-	-	-	590	1204	-	569	952	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	583	-	-	1155	-	-	127	53	*838	*79	54	448
Stage 1	-	-	-	-	-	-	498	490	-	*201	261	-
Stage 2	-	-	-	-	-	-	461	255	-	*790	487	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	583	-	-	1155	-	-	69	43	*838	*68	45	448
Mov Cap-2 Maneuver	-	-	-	-	-	-	69	43	-	*68	45	-
Stage 1	-	-	-	-	-	-	414	408	-	*167	259	-
Stage 2	-	-	-	-	-	-	287	253	-	*653	405	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.1	41.9	24.5
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	109	583	-	-	1155	-	-	68	448
HCM Lane V/C Ratio	0.105	0.168	-	-	0.007	-	-	0.304	0.372
HCM Control Delay (s)	41.9	12.4	-	-	8.1	-	-	79.6	17.7
HCM Lane LOS	E	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.3	0.6	-	-	0	-	-	1.1	1.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	382	45	75	438	259	71	470	79	143	379	116
Future Volume (veh/h)	176	382	45	75	438	259	71	470	79	143	379	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	210	455	54	89	521	308	85	560	94	170	451	138
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	246	1247	556	114	983	438	109	836	373	205	1028	458
Arrive On Green	0.14	0.36	0.36	0.06	0.28	0.28	0.06	0.24	0.24	0.12	0.29	0.29
Sat Flow, veh/h	1753	3497	1560	1753	3497	1560	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	210	455	54	89	521	308	85	560	94	170	451	138
Grp Sat Flow(s),veh/h/ln	1753	1749	1560	1753	1749	1560	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	10.0	8.2	2.0	4.3	10.7	15.1	4.1	12.4	4.2	8.1	8.9	5.8
Cycle Q Clear(g_c), s	10.0	8.2	2.0	4.3	10.7	15.1	4.1	12.4	4.2	8.1	8.9	5.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	246	1247	556	114	983	438	109	836	373	205	1028	458
V/C Ratio(X)	0.85	0.36	0.10	0.78	0.53	0.70	0.78	0.67	0.25	0.83	0.44	0.30
Avail Cap(c_a), veh/h	329	1824	814	329	1824	814	329	1824	814	329	1824	814
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	20.3	18.3	39.3	25.9	27.5	39.4	29.4	26.3	36.8	24.4	23.3
Incr Delay (d2), s/veh	12.1	0.3	0.1	4.3	0.6	2.9	4.5	1.3	0.5	4.5	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	3.2	0.7	1.9	4.3	5.6	1.8	5.1	1.5	3.6	3.5	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	20.6	18.4	43.6	26.5	30.4	43.9	30.7	26.8	41.3	24.8	23.9
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		719			918			739			759	
Approach Delay, s/veh		28.4			29.5			31.8			28.4	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	35.9	9.3	30.6	16.0	29.5	14.0	25.9				
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5				
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5				
Max Q Clear Time (g_c+I1), s	6.3	10.2	6.1	10.9	12.0	17.1	10.1	14.4				
Green Ext Time (p_c), s	0.0	4.7	0.0	5.2	0.1	6.9	0.1	6.0				
Intersection Summary												
HCM 6th Ctrl Delay			29.5									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	154	863	363	991	89	1310	130	860
v/c Ratio	0.58	0.84	0.85	0.83	0.61	0.83	0.73	0.52
Control Delay	67.9	49.6	74.4	45.4	76.7	42.7	80.6	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	49.6	74.4	45.4	76.7	42.7	80.6	34.3
Queue Length 50th (ft)	68	364	161	406	76	353	111	206
Queue Length 95th (ft)	107	458	#260	531	136	444	187	275
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	456	1216	456	1265	235	1737	235	1794
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.71	0.80	0.78	0.38	0.75	0.55	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	5	761	634	85	1353	47	230
v/c Ratio	0.02	0.36	0.45	0.40	0.36	0.21	0.57
Control Delay	10.0	10.3	1.6	40.1	3.6	36.7	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	10.3	1.6	40.1	3.6	36.7	11.0
Queue Length 50th (ft)	1	104	6	47	68	25	0
Queue Length 95th (ft)	7	182	32	m86	79	53	61
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	217	2114	1470	300	3721	391	529
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.36	0.43	0.28	0.36	0.12	0.43

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	116	847	42	19	946	329	12	14	43	521
v/c Ratio	0.51	0.33	0.04	0.05	0.47	0.31	0.06	0.05	0.19	0.78
Control Delay	49.3	2.0	0.4	12.4	13.4	3.4	31.3	0.3	34.4	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.3	2.0	0.4	12.4	13.4	3.4	31.3	0.3	34.4	12.5
Queue Length 50th (ft)	50	11	0	4	143	8	6	0	23	3
Queue Length 95th (ft)	126	57	m1	20	276	61	20	0	48	93
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2535	1184	368	2024	1055	327	417	345	751
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	0.33	0.04	0.05	0.47	0.31	0.04	0.03	0.12	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	455	54	89	521	308	85	560	94	170	451	138
v/c Ratio	0.71	0.39	0.09	0.54	0.62	0.51	0.53	0.67	0.21	0.67	0.41	0.23
Control Delay	55.4	27.9	3.0	56.3	36.7	6.9	56.4	37.8	7.9	55.1	28.8	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	27.9	3.0	56.3	36.7	6.9	56.4	37.8	7.9	55.1	28.8	6.1
Queue Length 50th (ft)	122	115	0	53	151	0	50	163	0	97	114	0
Queue Length 95th (ft)	#253	176	10	105	208	49	102	224	34	180	174	37
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	294	1638	776	294	1638	895	294	1638	782	294	1638	805
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.28	0.07	0.30	0.32	0.34	0.29	0.34	0.12	0.58	0.28	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	837	106	350	701	106	101	723	494	214	908	184
Future Volume (veh/h)	183	837	106	350	701	106	101	723	494	214	908	184
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	185	845	107	354	708	107	102	730	499	216	917	186
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	236	957	121	401	1081	163	125	1115	519	217	1616	327
Arrive On Green	0.07	0.30	0.30	0.12	0.35	0.35	0.07	0.33	0.33	0.12	0.38	0.38
Sat Flow, veh/h	3456	3173	402	3456	3096	468	1781	3404	1585	1781	4259	860
Grp Volume(v), veh/h	185	473	479	354	406	409	102	730	499	216	732	371
Grp Sat Flow(s),veh/h/ln	1728	1777	1798	1728	1777	1786	1781	1702	1585	1781	1702	1715
Q Serve(g_s), s	7.1	34.3	34.3	13.7	26.1	26.2	7.7	24.9	41.8	16.4	23.0	23.2
Cycle Q Clear(g_c), s	7.1	34.3	34.3	13.7	26.1	26.2	7.7	24.9	41.8	16.4	23.0	23.2
Prop In Lane	1.00		0.22	1.00		0.26	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	236	536	542	401	621	624	125	1115	519	217	1292	651
V/C Ratio(X)	0.78	0.88	0.88	0.88	0.65	0.66	0.82	0.65	0.96	1.00	0.57	0.57
Avail Cap(c_a), veh/h	421	584	591	421	621	624	217	1118	521	217	1292	651
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.1	45.0	45.0	59.0	37.2	37.2	62.1	39.0	44.7	59.4	33.2	33.3
Incr Delay (d2), s/veh	2.2	14.6	14.5	17.9	2.8	2.8	4.9	1.6	29.8	59.6	0.7	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	17.0	17.1	6.9	11.6	11.7	3.6	10.6	20.5	11.0	9.6	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.3	59.7	59.5	76.8	40.0	40.0	67.0	40.5	74.4	119.1	33.9	34.7
LnGrp LOS	E	E	E	E	D	D	E	D	E	F	C	C
Approach Vol, veh/h		1137			1169			1331			1319	
Approach Delay, s/veh		60.4			51.1			55.3			48.1	
Approach LOS		E			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	52.8	20.0	49.9	19.2	46.3	13.0	56.9
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	9.1	28.2	18.4	43.8	15.7	36.3	9.7	25.2
Green Ext Time (p_c), s	0.1	6.1	0.0	0.5	0.1	4.5	0.0	9.6

Intersection Summary	
HCM 6th Ctrl Delay	53.6
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1233	925	74	1063	0	16	0	69	0	0	0
Future Volume (veh/h)	7	1233	925	74	1063	0	16	0	69	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	7	1298	974	78	1119	0	17	0	73			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	392	2205	1141	198	4003	0	177	0	158			
Arrive On Green	0.62	0.62	0.62	0.22	1.00	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	503	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	7	1298	974	78	1119	0	17	0	73			
Grp Sat Flow(s),veh/h/ln	503	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.5	19.6	40.2	3.4	0.0	0.0	0.8	0.0	3.9			
Cycle Q Clear(g_c), s	0.5	19.6	40.2	3.4	0.0	0.0	0.8	0.0	3.9			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	392	2205	1141	198	4003	0	177	0	158			
V/C Ratio(X)	0.02	0.59	0.85	0.39	0.28	0.00	0.10	0.00	0.46			
Avail Cap(c_a), veh/h	392	2205	1141	303	4003	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.80	0.80	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	6.6	10.2	9.2	32.4	0.0	0.0	36.9	0.0	38.3			
Incr Delay (d2), s/veh	0.1	1.2	8.2	0.8	0.1	0.0	0.2	0.0	2.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	6.6	13.0	1.4	0.1	0.0	0.3	0.0	1.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.7	11.4	17.3	33.2	0.1	0.0	37.1	0.0	40.4			
LnGrp LOS	A	B	B	C	A	A	D	A	D			
Approach Vol, veh/h		2279			1197			90				
Approach Delay, s/veh		13.9			2.3			39.8				
Approach LOS		B			A			D				

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	61.3				76.0		14.0
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9
Max Q Clear Time (g_c+I1), s	5.4	42.2				2.0		5.9
Green Ext Time (p_c), s	0.1	0.0				14.9		0.2

Intersection Summary	
HCM 6th Ctrl Delay	10.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	143	1144	30	29	584	262	36	32	28	41	12	534
Future Volume (veh/h)	143	1144	30	29	584	262	36	32	28	41	12	534
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	1217	32	31	621	279	38	34	30	44	13	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	2752	1227	353	2180	972	142	108	173	151	36	
Arrive On Green	0.22	1.00	1.00	0.61	0.61	0.61	0.11	0.11	0.11	0.11	0.11	0.00
Sat Flow, veh/h	1781	3554	1585	445	3554	1585	739	994	1585	737	330	1585
Grp Volume(v), veh/h	152	1217	32	31	621	279	72	0	30	57	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	445	1777	1585	1734	0	1585	1068	0	1585
Q Serve(g_s), s	7.2	0.0	0.0	2.6	7.4	7.4	0.0	0.0	1.5	2.7	0.0	0.0
Cycle Q Clear(g_c), s	7.2	0.0	0.0	2.6	7.4	7.4	3.3	0.0	1.5	5.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.53		1.00	0.77		1.00
Lane Grp Cap(c), veh/h	193	2752	1227	353	2180	972	250	0	173	187	0	
V/C Ratio(X)	0.79	0.44	0.03	0.09	0.28	0.29	0.29	0.00	0.17	0.30	0.00	
Avail Cap(c_a), veh/h	501	2752	1227	353	2180	972	428	0	350	348	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.2	0.0	0.0	7.2	8.1	8.2	37.2	0.0	36.4	39.0	0.0	0.0
Incr Delay (d2), s/veh	4.0	0.4	0.0	0.5	0.3	0.7	0.6	0.0	0.5	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.2	0.0	0.3	2.5	2.3	1.5	0.0	0.6	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.2	0.4	0.0	7.7	8.5	8.9	37.8	0.0	36.9	39.9	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1401			931			102			57	A
Approach Delay, s/veh		4.5			8.6			37.5			39.9	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		75.1		14.9	14.5	60.6		14.9				
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1				
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9				
Max Q Clear Time (g_c+I1), s		2.0		7.9	9.2	9.4		5.3				
Green Ext Time (p_c), s		18.3		0.1	0.2	7.5		0.3				

Intersection Summary		
HCM 6th Ctrl Delay		8.2
HCM 6th LOS		A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	20	19	104	155	3
Future Vol, veh/h	3	20	19	104	155	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	22	21	113	168	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	325	170	171	0	-	0
Stage 1	170	-	-	-	-	-
Stage 2	155	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	669	874	1406	-	-	-
Stage 1	860	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	658	874	1406	-	-	-
Mov Cap-2 Maneuver	658	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	873	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1406	-	838	-	-
HCM Lane V/C Ratio	0.015	-	0.03	-	-
HCM Control Delay (s)	7.6	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	101	1094	5	3	734	27	5	0	11	72	0	103
Future Vol, veh/h	101	1094	5	3	734	27	5	0	11	72	0	103
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	105	1140	5	3	765	28	5	0	11	75	0	107

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	793	0	0	1145	0	0	1742	2152	573	1565	2140	397
Stage 1	-	-	-	-	-	-	1353	1353	-	785	785	-
Stage 2	-	-	-	-	-	-	389	799	-	780	1355	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	824	-	-	*948	-	-	149	66	*634	*246	68	602
Stage 1	-	-	-	-	-	-	467	436	-	*352	402	-
Stage 2	-	-	-	-	-	-	606	396	-	*597	435	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	824	-	-	*948	-	-	110	58	*634	*217	59	602
Mov Cap-2 Maneuver	-	-	-	-	-	-	110	58	-	*217	59	-
Stage 1	-	-	-	-	-	-	408	381	-	*307	401	-
Stage 2	-	-	-	-	-	-	496	395	-	*512	379	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	20.1	19.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	255	824	-	-	* 948	-	-	217	602
HCM Lane V/C Ratio	0.065	0.128	-	-	0.003	-	-	0.346	0.178
HCM Control Delay (s)	20.1	10	-	-	8.8	-	-	30.1	12.3
HCM Lane LOS	C	B	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.2	0.4	-	-	0	-	-	1.5	0.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	758	63	50	362	116	92	377	100	216	673	229
Future Volume (veh/h)	108	758	63	50	362	116	92	377	100	216	673	229
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	115	806	67	53	385	123	98	401	106	230	716	244
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	145	1160	517	67	1003	447	125	807	360	268	1093	488
Arrive On Green	0.08	0.33	0.33	0.04	0.29	0.29	0.07	0.23	0.23	0.15	0.32	0.32
Sat Flow, veh/h	1739	3469	1547	1739	3469	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	115	806	67	53	385	123	98	401	106	230	716	244
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1739	1735	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	5.1	15.9	2.4	2.4	7.0	4.9	4.4	7.9	4.5	10.2	14.1	10.1
Cycle Q Clear(g_c), s	5.1	15.9	2.4	2.4	7.0	4.9	4.4	7.9	4.5	10.2	14.1	10.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	1160	517	67	1003	447	125	807	360	268	1093	488
V/C Ratio(X)	0.79	0.70	0.13	0.79	0.38	0.28	0.78	0.50	0.29	0.86	0.65	0.50
Avail Cap(c_a), veh/h	352	1954	872	352	1954	872	352	1954	872	352	1954	872
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	22.8	18.3	37.7	22.5	21.7	36.1	26.3	25.0	32.6	23.3	22.0
Incr Delay (d2), s/veh	3.6	1.1	0.2	7.7	0.3	0.5	4.0	0.7	0.6	12.3	1.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.1	0.8	1.1	2.7	1.7	1.9	3.1	1.6	4.9	5.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	23.9	18.5	45.4	22.8	22.2	40.1	27.0	25.6	44.8	24.3	23.1
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		988			561			605			1190	
Approach Delay, s/veh		25.3			24.8			28.9			28.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	31.9	9.7	30.4	10.6	28.3	16.2	23.9
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	4.4	17.9	6.4	16.1	7.1	9.0	12.2	9.9
Green Ext Time (p_c), s	0.0	8.5	0.0	8.8	0.0	4.4	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	26.8
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	185	952	354	815	102	1229	216	1103
v/c Ratio	0.64	0.90	0.87	0.69	0.67	0.89dr	0.98	0.66
Control Delay	70.7	55.6	80.2	41.1	80.9	43.3	114.4	38.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.7	55.6	80.2	41.1	80.9	43.3	114.4	38.9
Queue Length 50th (ft)	85	428	165	325	92	338	~210	299
Queue Length 95th (ft)	123	#530	#251	418	150	398	#379	371
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	428	1139	428	1207	220	1641	220	1696
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.84	0.83	0.68	0.46	0.75	0.98	0.65

Intersection Summary

~ 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.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	7	1298	974	78	1119	17	73
v/c Ratio	0.03	0.62	0.69	0.38	0.31	0.07	0.25
Control Delay	11.0	14.8	4.6	47.6	3.4	31.9	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	14.8	4.6	47.6	3.4	31.9	7.8
Queue Length 50th (ft)	1	227	46	46	34	9	0
Queue Length 95th (ft)	10	408	148	m78	98	25	28
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	274	2078	1463	300	3658	391	417
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.62	0.67	0.26	0.31	0.04	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	152	1217	32	31	621	279	72	30	57	568
v/c Ratio	0.59	0.48	0.03	0.13	0.34	0.28	0.33	0.10	0.29	0.81
Control Delay	54.1	3.7	1.3	15.5	13.6	2.9	37.1	0.6	36.5	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	3.7	1.3	15.5	13.6	2.9	37.1	0.6	36.5	13.8
Queue Length 50th (ft)	94	70	0	7	88	0	39	0	31	9
Queue Length 95th (ft)	m151	83	m1	32	176	46	71	0	60	109
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2525	1176	232	1849	983	334	417	301	779
Starvation Cap Reductn	0	146	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	0.31	0.51	0.03	0.13	0.34	0.28	0.22	0.07	0.19	0.73

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	806	67	53	385	123	98	401	106	230	716	244
v/c Ratio	0.61	0.72	0.12	0.41	0.42	0.25	0.56	0.47	0.23	0.78	0.60	0.38
Control Delay	62.3	35.6	5.0	61.2	32.9	7.3	61.3	34.0	7.4	64.3	32.9	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	35.6	5.0	61.2	32.9	7.3	61.3	34.0	7.4	64.3	32.9	13.6
Queue Length 50th (ft)	70	234	0	32	102	0	60	113	0	141	205	40
Queue Length 95th (ft)	163	403	24	90	188	47	143	188	42	#405	351	130
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	294	1636	775	294	1636	796	294	1636	787	294	1636	813
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.49	0.09	0.18	0.24	0.15	0.33	0.25	0.13	0.78	0.44	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	713	72	324	804	194	85	849	407	239	802	255
Future Volume (veh/h)	199	713	72	324	804	194	85	849	407	239	802	255
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	221	792	80	360	893	216	94	943	452	266	891	283
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	959	97	408	946	229	116	1108	516	223	1480	468
Arrive On Green	0.08	0.29	0.29	0.12	0.33	0.33	0.07	0.33	0.33	0.13	0.39	0.39
Sat Flow, veh/h	3456	3259	329	3456	2838	686	1781	3404	1585	1781	3841	1215
Grp Volume(v), veh/h	221	432	440	360	559	550	94	943	452	266	789	385
Grp Sat Flow(s),veh/h/ln	1728	1777	1811	1728	1777	1747	1781	1702	1585	1781	1702	1652
Q Serve(g_s), s	8.3	29.8	29.9	13.5	40.3	40.4	6.9	34.1	35.5	16.5	24.4	24.6
Cycle Q Clear(g_c), s	8.3	29.8	29.9	13.5	40.3	40.4	6.9	34.1	35.5	16.5	24.4	24.6
Prop In Lane	1.00		0.18	1.00		0.39	1.00		1.00	1.00		0.74
Lane Grp Cap(c), veh/h	273	523	533	408	593	583	116	1108	516	223	1312	637
V/C Ratio(X)	0.81	0.83	0.83	0.88	0.94	0.94	0.81	0.85	0.88	1.19	0.60	0.60
Avail Cap(c_a), veh/h	433	600	612	433	600	590	223	1150	535	223	1312	637
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.7	43.3	43.3	57.2	42.7	42.7	60.8	41.4	41.9	57.6	32.4	32.4
Incr Delay (d2), s/veh	2.7	8.9	8.8	17.1	23.7	24.2	4.9	6.4	15.2	122.1	0.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	14.1	14.4	6.8	21.1	20.8	3.2	15.0	15.8	14.9	10.1	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.4	52.3	52.1	74.3	66.4	66.9	65.7	47.8	57.1	179.7	33.3	34.4
LnGrp LOS	E	D	D	E	E	E	E	D	E	F	C	C
Approach Vol, veh/h		1093			1469			1489			1440	
Approach Delay, s/veh		54.3			68.5			51.8			60.6	
Approach LOS		D			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	49.4	20.0	48.4	19.1	44.3	12.1	56.3
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	10.3	42.4	18.5	37.5	15.5	31.9	8.9	26.6
Green Ext Time (p_c), s	0.1	1.6	0.0	5.5	0.1	5.6	0.0	9.8

Intersection Summary	
HCM 6th Ctrl Delay	59.1
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	801	607	71	1341	0	48	0	200	0	0	0
Future Volume (veh/h)	5	801	607	71	1341	0	48	0	200	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	5	871	660	77	1458	0	52	0	217			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	284	1990	1141	198	3693	0	285	0	254			
Arrive On Green	0.56	0.56	0.56	0.22	1.00	0.00	0.16	0.00	0.16			
Sat Flow, veh/h	364	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	5	871	660	77	1458	0	52	0	217			
Grp Sat Flow(s),veh/h/ln	364	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.6	12.9	18.0	3.3	0.0	0.0	2.3	0.0	12.0			
Cycle Q Clear(g_c), s	0.6	12.9	18.0	3.3	0.0	0.0	2.3	0.0	12.0			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	284	1990	1141	198	3693	0	285	0	254			
V/C Ratio(X)	0.02	0.44	0.58	0.39	0.39	0.00	0.18	0.00	0.85			
Avail Cap(c_a), veh/h	284	1990	1141	303	3693	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.73	0.73	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.8	11.5	6.0	32.4	0.0	0.0	32.7	0.0	36.8			
Incr Delay (d2), s/veh	0.1	0.7	2.1	0.7	0.2	0.0	0.3	0.0	13.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	4.6	5.3	1.4	0.1	0.0	1.0	0.0	5.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.0	12.2	8.2	33.1	0.2	0.0	33.0	0.0	50.7			
LnGrp LOS	A	B	A	C	A	A	C	A	D			
Approach Vol, veh/h		1536			1535			269				
Approach Delay, s/veh		10.5			1.9			47.3				
Approach LOS		B			A			D				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.7	55.8				70.5		19.5				
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1				
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9				
Max Q Clear Time (g_c+I1), s	5.3	20.0				2.0		14.0				
Green Ext Time (p_c), s	0.1	11.8				22.6		0.4				

Intersection Summary			
HCM 6th Ctrl Delay			9.5
HCM 6th LOS			A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	845	38	17	942	288	10	1	13	15	16	482
Future Volume (veh/h)	122	845	38	17	942	288	10	1	13	15	16	482
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	929	42	19	1035	316	11	1	14	16	18	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	2832	1263	449	2266	1011	192	14	137	107	97	
Arrive On Green	0.21	1.00	1.00	0.64	0.64	0.64	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1781	3554	1585	579	3554	1585	1333	165	1585	558	1124	1585
Grp Volume(v), veh/h	134	929	42	19	1035	316	12	0	14	34	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	579	1777	1585	1498	0	1585	1682	0	1585
Q Serve(g_s), s	6.3	0.0	0.0	1.1	13.4	8.1	0.0	0.0	0.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.3	0.0	0.0	1.1	13.4	8.1	0.5	0.0	0.7	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.92		1.00	0.47		1.00
Lane Grp Cap(c), veh/h	191	2832	1263	449	2266	1011	206	0	137	204	0	
V/C Ratio(X)	0.70	0.33	0.03	0.04	0.46	0.31	0.06	0.00	0.10	0.17	0.00	
Avail Cap(c_a), veh/h	501	2832	1263	449	2266	1011	398	0	350	422	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	0.0	6.1	8.3	7.4	37.8	0.0	37.9	38.3	0.0	0.0
Incr Delay (d2), s/veh	3.1	0.3	0.0	0.2	0.7	0.8	0.1	0.0	0.3	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.1	0.0	0.1	4.4	2.5	0.2	0.0	0.3	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	0.3	0.0	6.3	9.0	8.2	37.9	0.0	38.2	38.6	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1105			1370			26			34	A
Approach Delay, s/veh		4.7			8.8			38.1			38.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		77.1		12.9	14.3	62.8		12.9				
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1				
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9				
Max Q Clear Time (g_c+I1), s		2.0		3.5	8.3	15.4		2.7				
Green Ext Time (p_c), s		12.1		0.1	0.2	9.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		7.7
HCM 6th LOS		A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	80	126	0
Future Vol, veh/h	0	0	0	80	126	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	87	137	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	224	137	137	0	-	0
Stage 1	137	-	-	-	-	-
Stage 2	87	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	764	911	1447	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	936	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	764	911	1447	-	-	-
Mov Cap-2 Maneuver	764	-	-	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	936	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1447	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	53	747	9	7	1097	27	6	0	4	9	0	117
Future Vol, veh/h	53	747	9	7	1097	27	6	0	4	9	0	117
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	61	859	10	8	1261	31	7	0	5	10	0	134

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1292	0	0	869	0	0	1633	2294	435	1845	2284	646
Stage 1	-	-	-	-	-	-	986	986	-	1293	1293	-
Stage 2	-	-	-	-	-	-	647	1308	-	552	991	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	532	-	-	1080	-	-	112	41	*804	*69	42	414
Stage 1	-	-	-	-	-	-	518	500	-	*172	231	-
Stage 2	-	-	-	-	-	-	426	228	-	*758	496	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	532	-	-	1080	-	-	69	36	*804	*62	37	414
Mov Cap-2 Maneuver	-	-	-	-	-	-	69	36	-	*62	37	-
Stage 1	-	-	-	-	-	-	458	443	-	*152	229	-
Stage 2	-	-	-	-	-	-	285	226	-	*667	439	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	41.9	21.8
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	109	532	-	-	1080	-	-	62	414
HCM Lane V/C Ratio	0.105	0.115	-	-	0.007	-	-	0.167	0.325
HCM Control Delay (s)	41.9	12.6	-	-	8.4	-	-	74.4	17.8
HCM Lane LOS	E	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.3	0.4	-	-	0	-	-	0.6	1.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s   +: Computation Not Defined   *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	171	475	46	75	534	259	69	470	79	143	379	111
Future Volume (veh/h)	171	475	46	75	534	259	69	470	79	143	379	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	204	565	55	89	636	308	82	560	94	170	451	132
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	239	1270	567	114	1020	455	105	829	370	204	1028	458
Arrive On Green	0.14	0.36	0.36	0.06	0.29	0.29	0.06	0.24	0.24	0.12	0.29	0.29
Sat Flow, veh/h	1753	3497	1560	1753	3497	1560	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	204	565	55	89	636	308	82	560	94	170	451	132
Grp Sat Flow(s),veh/h/ln	1753	1749	1560	1753	1749	1560	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	9.9	10.7	2.0	4.4	13.7	15.2	4.0	12.7	4.3	8.3	9.1	5.7
Cycle Q Clear(g_c), s	9.9	10.7	2.0	4.4	13.7	15.2	4.0	12.7	4.3	8.3	9.1	5.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	239	1270	567	114	1020	455	105	829	370	204	1028	458
V/C Ratio(X)	0.85	0.44	0.10	0.78	0.62	0.68	0.78	0.68	0.25	0.83	0.44	0.29
Avail Cap(c_a), veh/h	322	1787	797	322	1787	797	322	1787	797	322	1787	797
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	21.1	18.3	40.1	26.7	27.2	40.4	30.2	27.0	37.6	24.9	23.7
Incr Delay (d2), s/veh	12.0	0.3	0.1	4.4	0.9	2.5	4.7	1.4	0.5	5.3	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	4.1	0.7	1.9	5.5	5.6	1.8	5.2	1.6	3.7	3.6	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	21.4	18.4	44.5	27.6	29.7	45.0	31.6	27.5	43.0	25.4	24.2
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		824			1033			736			753	
Approach Delay, s/veh		28.0			29.7			32.5			29.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	37.1	9.2	31.1	15.9	30.9	14.2	26.2
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	6.4	12.7	6.0	11.1	11.9	17.2	10.3	14.7
Green Ext Time (p_c), s	0.0	5.9	0.0	5.1	0.1	8.2	0.1	6.0

Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	221	872	360	1109	94	1395	266	1174
v/c Ratio	0.70	0.84	0.89	0.99	0.65	0.90	1.24	0.67
Control Delay	72.0	51.8	84.1	68.8	81.3	49.8	189.1	37.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.0	51.8	84.1	68.8	81.3	49.8	189.1	37.9
Queue Length 50th (ft)	100	381	165	510	83	410	~298	307
Queue Length 95th (ft)	143	465	#256	#703	142	487	#487	392
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	417	1111	417	1121	215	1594	215	1743
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.78	0.86	0.99	0.44	0.88	1.24	0.67

Intersection Summary

~ 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	5	871	660	77	1458	52	217
v/c Ratio	0.03	0.41	0.47	0.37	0.39	0.23	0.56
Control Delay	9.8	10.6	1.6	38.2	4.1	37.2	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	9.8	10.6	1.6	38.2	4.2	37.2	11.0
Queue Length 50th (ft)	1	124	5	43	75	28	0
Queue Length 95th (ft)	7	209	29	m75	108	58	59
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	196	2123	1476	300	3721	391	519
Starvation Cap Reductn	0	0	0	0	794	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.41	0.45	0.26	0.50	0.13	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	134	929	42	19	1035	316	12	14	34	530
v/c Ratio	0.55	0.37	0.04	0.06	0.55	0.32	0.06	0.05	0.14	0.80
Control Delay	51.8	2.3	0.3	13.3	15.8	4.3	30.9	0.3	33.0	13.7
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	2.3	0.3	13.3	15.8	4.3	30.9	0.3	33.0	13.7
Queue Length 50th (ft)	57	11	0	4	167	13	6	0	18	10
Queue Length 95th (ft)	141	56	0	20	321	71	20	0	40	107
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2528	1180	315	1881	985	329	417	361	748
Starvation Cap Reductn	0	429	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	0.27	0.44	0.04	0.06	0.55	0.32	0.04	0.03	0.09	0.71

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	204	565	55	89	636	308	82	560	94	170	451	132
v/c Ratio	0.73	0.45	0.09	0.55	0.68	0.48	0.54	0.68	0.21	0.70	0.42	0.23
Control Delay	60.4	28.6	2.9	60.3	37.6	6.2	60.4	40.4	8.2	60.6	31.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.4	28.6	2.9	60.3	37.6	6.2	60.4	40.4	8.2	60.6	31.0	6.5
Queue Length 50th (ft)	129	153	0	57	195	0	52	176	0	105	123	0
Queue Length 95th (ft)	#269	225	11	111	260	47	105	240	35	#207	187	38
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	278	1548	738	278	1548	863	278	1548	744	278	1548	765
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.36	0.07	0.32	0.41	0.36	0.29	0.36	0.13	0.61	0.29	0.17

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	849	106	349	771	204	121	867	493	372	1037	364
Future Volume (veh/h)	297	849	106	349	771	204	121	867	493	372	1037	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	300	858	107	353	779	206	122	876	498	376	1047	368
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	965	120	400	885	234	146	1113	518	216	1367	480
Arrive On Green	0.10	0.30	0.30	0.12	0.32	0.32	0.08	0.33	0.33	0.12	0.37	0.37
Sat Flow, veh/h	3456	3179	396	3456	2780	735	1781	3404	1585	1781	3728	1310
Grp Volume(v), veh/h	300	480	485	353	498	487	122	876	498	376	956	459
Grp Sat Flow(s),veh/h/ln	1728	1777	1799	1728	1777	1738	1781	1702	1585	1781	1702	1635
Q Serve(g_s), s	11.6	35.0	35.0	13.7	36.1	36.1	9.2	31.7	41.9	16.5	33.6	33.6
Cycle Q Clear(g_c), s	11.6	35.0	35.0	13.7	36.1	36.1	9.2	31.7	41.9	16.5	33.6	33.6
Prop In Lane	1.00		0.22	1.00		0.42	1.00		1.00	1.00		0.80
Lane Grp Cap(c), veh/h	349	539	546	400	565	553	146	1113	518	216	1248	599
V/C Ratio(X)	0.86	0.89	0.89	0.88	0.88	0.88	0.84	0.79	0.96	1.74	0.77	0.77
Avail Cap(c_a), veh/h	420	582	589	420	582	569	216	1115	519	216	1248	599
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.1	45.1	45.1	59.2	43.9	43.9	61.5	41.5	44.9	59.7	37.9	37.9
Incr Delay (d2), s/veh	12.5	15.4	15.3	17.9	14.7	15.0	11.0	4.0	30.0	350.9	3.1	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	17.4	17.6	6.9	17.8	17.5	4.6	13.8	20.5	28.5	14.4	14.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.6	60.6	60.4	77.1	58.6	58.9	72.5	45.5	74.8	410.6	41.0	44.2
LnGrp LOS	E	E	E	E	E	E	E	D	E	F	D	D
Approach Vol, veh/h		1265			1338			1496			1791	
Approach Delay, s/veh		63.4			63.6			57.5			119.4	
Approach LOS		E			E			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.2	48.7	20.0	49.9	19.2	46.8	14.6	55.3				
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5				
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5				
Max Q Clear Time (g_c+I1), s	13.6	38.1	18.5	43.9	15.7	37.0	11.2	35.6				
Green Ext Time (p_c), s	0.1	3.9	0.0	0.5	0.1	4.3	0.0	6.7				
Intersection Summary												
HCM 6th Ctrl Delay			79.0									
HCM 6th LOS			E									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1381	946	70	1210	0	36	0	63	0	0	0
Future Volume (veh/h)	7	1381	946	70	1210	0	36	0	63	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	7	1454	996	74	1274	0	38	0	66			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	348	2193	1141	198	3985	0	183	0	163			
Arrive On Green	0.62	0.62	0.62	0.22	1.00	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	434	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	7	1454	996	74	1274	0	38	0	66			
Grp Sat Flow(s),veh/h/ln	434	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.6	23.9	42.6	3.2	0.0	0.0	1.8	0.0	3.5			
Cycle Q Clear(g_c), s	0.6	23.9	42.6	3.2	0.0	0.0	1.8	0.0	3.5			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	348	2193	1141	198	3985	0	183	0	163			
V/C Ratio(X)	0.02	0.66	0.87	0.37	0.32	0.00	0.21	0.00	0.40			
Avail Cap(c_a), veh/h	348	2193	1141	303	3985	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	6.7	11.2	9.5	32.3	0.0	0.0	37.0	0.0	37.8			
Incr Delay (d2), s/veh	0.1	1.6	9.3	0.7	0.2	0.0	0.6	0.0	1.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	8.1	14.0	1.3	0.1	0.0	0.8	0.0	1.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.8	12.8	18.8	33.0	0.2	0.0	37.6	0.0	39.4			
LnGrp LOS	A	B	B	C	A	A	D	A	D			
Approach Vol, veh/h		2457			1348			104				
Approach Delay, s/veh		15.2			2.0			38.7				
Approach LOS		B			A			D				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.7	60.9				75.6		14.4				
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1				
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9				
Max Q Clear Time (g_c+I1), s	5.2	44.6				2.0		5.5				
Green Ext Time (p_c), s	0.1	0.0				18.2		0.2				

Intersection Summary			
HCM 6th Ctrl Delay			11.3
HCM 6th LOS			B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	1273	30	29	697	256	36	32	28	38	12	564
Future Volume (veh/h)	156	1273	30	29	697	256	36	32	28	38	12	564
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	166	1354	32	31	741	272	38	34	30	40	13	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	2752	1228	318	2168	967	141	108	172	149	39	
Arrive On Green	0.22	1.00	1.00	0.61	0.61	0.61	0.11	0.11	0.11	0.11	0.11	0.00
Sat Flow, veh/h	1781	3554	1585	390	3554	1585	737	993	1585	725	360	1585
Grp Volume(v), veh/h	166	1354	32	31	741	272	72	0	30	53	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	390	1777	1585	1730	0	1585	1085	0	1585
Q Serve(g_s), s	8.0	0.0	0.0	3.0	9.2	7.3	0.0	0.0	1.5	2.3	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0	3.0	9.2	7.3	3.3	0.0	1.5	5.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.53		1.00	0.75		1.00
Lane Grp Cap(c), veh/h	200	2752	1228	318	2168	967	249	0	172	188	0	
V/C Ratio(X)	0.83	0.49	0.03	0.10	0.34	0.28	0.29	0.00	0.17	0.28	0.00	
Avail Cap(c_a), veh/h	501	2752	1228	318	2168	967	428	0	350	350	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.1	0.0	0.0	7.4	8.6	8.3	37.2	0.0	36.4	38.7	0.0	0.0
Incr Delay (d2), s/veh	4.5	0.4	0.0	0.6	0.4	0.7	0.6	0.0	0.5	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.2	0.0	0.3	3.1	2.3	1.5	0.0	0.6	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	0.4	0.0	8.0	9.1	9.0	37.8	0.0	36.9	39.5	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1552			1044			102			53	A
Approach Delay, s/veh		4.5			9.0			37.5			39.5	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		75.1		14.9	14.8	60.3		14.9				
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1				
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9				
Max Q Clear Time (g_c+I1), s		2.0		7.6	10.0	11.2		5.3				
Green Ext Time (p_c), s		21.8		0.1	0.3	8.2		0.3				

Intersection Summary			
HCM 6th Ctrl Delay			8.1
HCM 6th LOS			A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	104	155	0
Future Vol, veh/h	0	0	0	104	155	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	113	168	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	281	168	168	0	-	0
Stage 1	168	-	-	-	-	-
Stage 2	113	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	709	876	1410	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	709	876	1410	-	-	-
Mov Cap-2 Maneuver	709	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	912	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1410	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	1234	5	3	857	22	5	0	11	67	0	88
Future Vol, veh/h	87	1234	5	3	857	22	5	0	11	67	0	88
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	91	1285	5	3	893	23	5	0	11	70	0	92

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	916	0	0	1290	0	0	1923	2392	645	1736	2383	458
Stage 1	-	-	-	-	-	-	1470	1470	-	911	911	-
Stage 2	-	-	-	-	-	-	453	922	-	825	1472	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	740	-	-	*897	-	-	100	38	*600	*175	39	550
Stage 1	-	-	-	-	-	-	413	392	-	*295	351	-
Stage 2	-	-	-	-	-	-	556	347	-	*565	391	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	740	-	-	*897	-	-	75	33	*600	*155	34	550
Mov Cap-2 Maneuver	-	-	-	-	-	-	75	33	-	*155	34	-
Stage 1	-	-	-	-	-	-	362	344	-	*259	350	-
Stage 2	-	-	-	-	-	-	462	346	-	*486	343	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	26	27.2
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	188	740	-	-	* 897	-	-	155	550
HCM Lane V/C Ratio	0.089	0.122	-	-	0.003	-	-	0.45	0.167
HCM Control Delay (s)	26	10.5	-	-	9	-	-	46	12.9
HCM Lane LOS	D	B	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0.3	0.4	-	-	0	-	-	2.1	0.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	896	63	50	480	116	94	377	100	216	673	226
Future Volume (veh/h)	106	896	63	50	480	116	94	377	100	216	673	226
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	113	953	67	53	511	123	100	401	106	230	716	240
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	142	1279	571	67	1130	504	127	774	345	265	1050	468
Arrive On Green	0.08	0.37	0.37	0.04	0.33	0.33	0.07	0.22	0.22	0.15	0.30	0.30
Sat Flow, veh/h	1739	3469	1547	1739	3469	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	113	953	67	53	511	123	100	401	106	230	716	240
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1739	1735	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	5.6	20.9	2.5	2.6	10.2	5.1	4.9	8.9	5.0	11.3	15.9	11.2
Cycle Q Clear(g_c), s	5.6	20.9	2.5	2.6	10.2	5.1	4.9	8.9	5.0	11.3	15.9	11.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	142	1279	571	67	1130	504	127	774	345	265	1050	468
V/C Ratio(X)	0.80	0.75	0.12	0.79	0.45	0.24	0.79	0.52	0.31	0.87	0.68	0.51
Avail Cap(c_a), veh/h	318	1765	787	318	1765	787	318	1765	787	318	1765	787
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.4	24.0	18.2	41.7	23.3	21.6	39.9	29.8	28.3	36.2	26.8	25.2
Incr Delay (d2), s/veh	3.8	1.5	0.1	7.5	0.4	0.4	4.1	0.8	0.7	17.1	1.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	8.1	0.9	1.2	4.0	1.8	2.2	3.6	1.8	5.8	6.3	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	25.5	18.3	49.2	23.7	22.0	44.0	30.6	29.0	53.4	27.9	26.4
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1133			687			607			1186	
Approach Delay, s/veh		26.8			25.4			32.5			32.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	37.7	10.4	32.0	11.1	34.0	17.3	25.0
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	4.6	22.9	6.9	17.9	7.6	12.2	13.3	10.9
Green Ext Time (p_c), s	0.0	9.3	0.0	8.6	0.0	5.7	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	300	965	353	985	122	1374	376	1415
v/c Ratio	0.81	0.91	0.89	0.91	0.74	0.89	1.76	0.85
Control Delay	76.8	57.8	84.0	56.7	86.0	49.2	393.2	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.8	57.8	84.0	56.7	86.0	49.2	393.2	46.0
Queue Length 50th (ft)	138	437	165	444	110	407	~513	422
Queue Length 95th (ft)	190	#557	#250	#575	177	472	#718	#509
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	416	1106	416	1112	214	1593	214	1669
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.87	0.85	0.89	0.57	0.86	1.76	0.85

Intersection Summary

~ 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	7	1454	996	74	1274	38	66
v/c Ratio	0.03	0.70	0.71	0.36	0.35	0.15	0.22
Control Delay	11.3	16.9	4.8	45.1	3.5	33.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	16.9	4.8	45.1	3.5	33.3	6.3
Queue Length 50th (ft)	1	276	47	44	49	20	0
Queue Length 95th (ft)	10	#536	151	m72	106	43	23
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	232	2071	1464	300	3642	391	417
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.70	0.68	0.25	0.35	0.10	0.16

Intersection Summary

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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	166	1354	32	31	741	272	72	30	53	600
v/c Ratio	0.62	0.55	0.03	0.16	0.42	0.29	0.29	0.09	0.23	0.85
Control Delay	57.1	4.1	1.2	18.2	16.1	3.1	34.1	0.5	33.1	18.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.1	4.2	1.2	18.2	16.1	3.1	34.1	0.5	33.1	18.3
Queue Length 50th (ft)	103	73	0	9	125	0	37	0	27	35
Queue Length 95th (ft)	m149	94	m0	34	219	46	71	0	56	#173
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2462	1148	192	1760	946	341	419	312	764
Starvation Cap Reductn	0	132	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	0.33	0.58	0.03	0.16	0.42	0.29	0.21	0.07	0.17	0.79

Intersection Summary

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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	953	67	53	511	123	100	401	106	230	716	240
v/c Ratio	0.63	0.78	0.11	0.43	0.50	0.23	0.59	0.47	0.23	0.84	0.67	0.41
Control Delay	66.6	37.8	4.9	65.0	33.7	7.0	65.7	36.2	7.5	73.7	37.5	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	37.8	4.9	65.0	33.7	7.0	65.7	36.2	7.5	73.7	37.5	14.7
Queue Length 50th (ft)	78	304	0	37	147	0	69	127	0	162	237	46
Queue Length 95th (ft)	162	498	24	90	253	47	146	188	42	#405	351	128
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	275	1532	731	275	1532	753	275	1532	744	275	1532	771
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.62	0.09	0.19	0.33	0.16	0.36	0.26	0.14	0.84	0.47	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
1: Carson Street & Avalon Boulevard

01/13/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	717	72	327	808	196	85	849	409	241	802	255
Future Volume (veh/h)	199	717	72	327	808	196	85	849	409	241	802	255
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	221	797	80	363	898	218	94	943	454	268	891	283
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	959	96	411	947	230	116	1109	516	223	1480	468
Arrive On Green	0.08	0.29	0.29	0.12	0.33	0.33	0.07	0.33	0.33	0.12	0.39	0.39
Sat Flow, veh/h	3456	3261	327	3456	2836	688	1781	3404	1585	1781	3841	1215
Grp Volume(v), veh/h	221	434	443	363	562	554	94	943	454	268	789	385
Grp Sat Flow(s),veh/h/ln	1728	1777	1811	1728	1777	1747	1781	1702	1585	1781	1702	1652
Q Serve(g_s), s	8.3	30.1	30.2	13.7	40.7	40.8	6.9	34.1	35.7	16.5	24.5	24.6
Cycle Q Clear(g_c), s	8.3	30.1	30.2	13.7	40.7	40.8	6.9	34.1	35.7	16.5	24.5	24.6
Prop In Lane	1.00		0.18	1.00		0.39	1.00		1.00	1.00		0.74
Lane Grp Cap(c), veh/h	273	522	533	411	593	583	116	1109	516	223	1312	636
V/C Ratio(X)	0.81	0.83	0.83	0.88	0.95	0.95	0.81	0.85	0.88	1.20	0.60	0.60
Avail Cap(c_a), veh/h	432	599	611	432	599	589	223	1147	534	223	1312	636
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.8	43.5	43.5	57.2	42.9	42.9	60.9	41.5	42.1	57.8	32.5	32.5
Incr Delay (d2), s/veh	2.7	9.4	9.2	17.5	24.7	25.2	4.9	6.4	15.6	126.3	0.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	14.3	14.6	6.9	21.4	21.2	3.3	15.1	16.0	15.2	10.2	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.5	52.9	52.8	74.7	67.5	68.1	65.8	47.9	57.7	184.1	33.4	34.4
LnGrp LOS	E	D	D	E	E	E	E	D	E	F	C	C
Approach Vol, veh/h		1098			1479			1491			1442	
Approach Delay, s/veh		54.8			69.5			52.0			61.7	
Approach LOS		D			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	49.6	20.0	48.5	19.2	44.3	12.1	56.4
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	10.3	42.8	18.5	37.7	15.7	32.2	8.9	26.6
Green Ext Time (p_c), s	0.1	1.3	0.0	5.3	0.1	5.6	0.0	9.8

Intersection Summary		
HCM 6th Ctrl Delay		59.8
HCM 6th LOS		E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	813	607	78	1352	0	48	0	212	0	0	0
Future Volume (veh/h)	5	813	607	78	1352	0	48	0	212	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	5	884	660	85	1470	0	52	0	230			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	279	1962	1141	198	3652	0	299	0	266			
Arrive On Green	0.55	0.55	0.55	0.22	1.00	0.00	0.17	0.00	0.17			
Sat Flow, veh/h	360	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	5	884	660	85	1470	0	52	0	230			
Grp Sat Flow(s),veh/h/ln	360	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.6	13.4	18.0	3.7	0.0	0.0	2.3	0.0	12.7			
Cycle Q Clear(g_c), s	0.6	13.4	18.0	3.7	0.0	0.0	2.3	0.0	12.7			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	279	1962	1141	198	3652	0	299	0	266			
V/C Ratio(X)	0.02	0.45	0.58	0.43	0.40	0.00	0.17	0.00	0.86			
Avail Cap(c_a), veh/h	279	1962	1141	303	3652	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.72	0.72	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	9.2	12.0	6.0	32.5	0.0	0.0	32.1	0.0	36.4			
Incr Delay (d2), s/veh	0.1	0.8	2.1	0.8	0.2	0.0	0.3	0.0	15.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	4.8	5.3	1.5	0.1	0.0	1.0	0.0	6.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.3	12.8	8.2	33.3	0.2	0.0	32.4	0.0	52.1			
LnGrp LOS	A	B	A	C	A	A	C	A	D			
Approach Vol, veh/h		1549			1555			282				
Approach Delay, s/veh		10.8			2.0			48.5				
Approach LOS		B			A			D				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.7	55.1				69.8		20.2				
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1				
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9				
Max Q Clear Time (g_c+I1), s	5.7	20.0				2.0		14.7				
Green Ext Time (p_c), s	0.1	11.9				22.9		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			9.9									
HCM 6th LOS			A									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	869	38	17	960	299	10	1	13	23	16	482
Future Volume (veh/h)	122	869	38	17	960	299	10	1	13	23	16	482
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	955	42	19	1055	329	11	1	14	25	18	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	2815	1255	437	2248	1003	200	15	145	132	79	
Arrive On Green	0.21	1.00	1.00	0.63	0.63	0.63	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1781	3554	1585	565	3554	1585	1352	164	1585	754	862	1585
Grp Volume(v), veh/h	134	955	42	19	1055	329	12	0	14	43	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	565	1777	1585	1516	0	1585	1616	0	1585
Q Serve(g_s), s	6.3	0.0	0.0	1.2	14.0	8.7	0.0	0.0	0.7	0.6	0.0	0.0
Cycle Q Clear(g_c), s	6.3	0.0	0.0	1.2	14.0	8.7	0.5	0.0	0.7	2.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.92		1.00	0.58		1.00
Lane Grp Cap(c), veh/h	191	2815	1255	437	2248	1003	215	0	145	211	0	
V/C Ratio(X)	0.70	0.34	0.03	0.04	0.47	0.33	0.06	0.00	0.10	0.20	0.00	
Avail Cap(c_a), veh/h	501	2815	1255	437	2248	1003	400	0	350	414	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	0.0	6.3	8.6	7.7	37.4	0.0	37.5	38.0	0.0	0.0
Incr Delay (d2), s/veh	3.1	0.3	0.0	0.2	0.7	0.9	0.1	0.0	0.3	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.1	0.0	0.1	4.6	2.7	0.2	0.0	0.3	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	0.3	0.0	6.5	9.3	8.5	37.5	0.0	37.8	38.5	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1131			1403			26			43	A
Approach Delay, s/veh		4.6			9.1			37.7			38.5	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		76.7		13.3	14.3	62.3		13.3
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9
Max Q Clear Time (g_c+I1), s		2.0		4.0	8.3	16.0		2.7
Green Ext Time (p_c), s		12.6		0.1	0.2	8.9		0.0

Intersection Summary			
HCM 6th Ctrl Delay			7.9
HCM 6th LOS			A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	37	42	80	126	7
Future Vol, veh/h	7	37	42	80	126	7
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	40	46	87	137	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	320	141	145	0	-	0
Stage 1	141	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	673	907	1437	-	-	-
Stage 1	886	-	-	-	-	-
Stage 2	852	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	650	907	1437	-	-	-
Mov Cap-2 Maneuver	650	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1437	-	853	-	-
HCM Lane V/C Ratio	0.032	-	0.056	-	-
HCM Control Delay (s)	7.6	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	747	9	7	1097	36	6	0	4	18	0	145
Future Vol, veh/h	85	747	9	7	1097	36	6	0	4	18	0	145
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	98	859	10	8	1261	41	7	0	5	21	0	167

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1302	0	0	869	0	0	1707	2378	435	1924	2363	651
Stage 1	-	-	-	-	-	-	1060	1060	-	1298	1298	-
Stage 2	-	-	-	-	-	-	647	1318	-	626	1065	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	528	-	-	1080	-	-	95	35	*804	*57	36	411
Stage 1	-	-	-	-	-	-	453	452	-	*171	230	-
Stage 2	-	-	-	-	-	-	426	225	-	*758	449	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	528	-	-	1080	-	-	48	28	*804	*48	29	411
Mov Cap-2 Maneuver	-	-	-	-	-	-	48	28	-	*48	29	-
Stage 1	-	-	-	-	-	-	368	368	-	*139	228	-
Stage 2	-	-	-	-	-	-	251	223	-	*613	365	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.1	59.8	31.6
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	77	528	-	-	1080	-	-	48	411
HCM Lane V/C Ratio	0.149	0.185	-	-	0.007	-	-	0.431	0.406
HCM Control Delay (s)	59.8	13.4	-	-	8.4	-	-	127.9	19.6
HCM Lane LOS	F	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.5	0.7	-	-	0	-	-	1.6	1.9

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	477	48	75	536	259	72	470	79	143	379	116
Future Volume (veh/h)	176	477	48	75	536	259	72	470	79	143	379	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	210	568	57	89	638	308	86	560	94	170	451	138
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	245	1279	571	114	1017	454	110	827	369	204	1015	453
Arrive On Green	0.14	0.37	0.37	0.06	0.29	0.29	0.06	0.24	0.24	0.12	0.29	0.29
Sat Flow, veh/h	1753	3497	1560	1753	3497	1560	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	210	568	57	89	638	308	86	560	94	170	451	138
Grp Sat Flow(s),veh/h/ln	1753	1749	1560	1753	1749	1560	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	10.3	10.8	2.1	4.4	13.9	15.3	4.2	12.8	4.3	8.3	9.2	6.0
Cycle Q Clear(g_c), s	10.3	10.8	2.1	4.4	13.9	15.3	4.2	12.8	4.3	8.3	9.2	6.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	245	1279	571	114	1017	454	110	827	369	204	1015	453
V/C Ratio(X)	0.86	0.44	0.10	0.78	0.63	0.68	0.78	0.68	0.25	0.83	0.44	0.30
Avail Cap(c_a), veh/h	319	1772	790	319	1772	790	319	1772	790	319	1772	790
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	21.1	18.3	40.5	27.0	27.5	40.6	30.5	27.2	38.0	25.4	24.3
Incr Delay (d2), s/veh	13.5	0.3	0.1	4.4	0.9	2.5	4.5	1.4	0.5	5.7	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	4.2	0.7	2.0	5.6	5.7	1.9	5.3	1.6	3.7	3.7	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.4	21.4	18.4	44.8	27.9	30.0	45.1	31.9	27.8	43.6	25.8	24.8
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		835			1035			740			759	
Approach Delay, s/veh		28.5			30.0			32.9			29.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	37.6	9.5	31.0	16.3	31.0	14.2	26.3
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	6.4	12.8	6.2	11.2	12.3	17.3	10.3	14.8
Green Ext Time (p_c), s	0.0	5.9	0.0	5.2	0.1	8.2	0.1	6.0

Intersection Summary			
HCM 6th Ctrl Delay			30.2
HCM 6th LOS			C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	221	877	363	1116	94	1397	268	1174
v/c Ratio	0.69	0.84	0.90	1.00	0.65	0.90	1.25	0.67
Control Delay	71.9	52.1	84.8	70.2	81.4	50.0	192.3	37.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	52.1	84.8	70.2	81.4	50.0	192.3	37.9
Queue Length 50th (ft)	101	384	168	516	83	413	~302	308
Queue Length 95th (ft)	143	469	#260	#711	142	489	#493	392
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	417	1110	417	1121	215	1593	215	1743
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.79	0.87	1.00	0.44	0.88	1.25	0.67

Intersection Summary

~ 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	5	884	660	85	1470	52	230
v/c Ratio	0.03	0.42	0.47	0.40	0.40	0.23	0.57
Control Delay	10.2	11.0	1.7	38.6	4.2	37.0	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	10.2	11.0	1.7	38.6	4.3	37.0	11.0
Queue Length 50th (ft)	1	127	9	48	76	28	0
Queue Length 95th (ft)	7	218	36	m82	115	57	61
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	192	2112	1469	300	3717	391	529
Starvation Cap Reductn	0	0	0	0	763	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.42	0.45	0.28	0.50	0.13	0.43

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	134	955	42	19	1055	329	12	14	43	530
v/c Ratio	0.55	0.38	0.04	0.06	0.56	0.33	0.06	0.05	0.19	0.80
Control Delay	52.4	2.4	0.3	13.4	16.0	4.5	30.9	0.3	34.0	13.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	2.5	0.3	13.4	16.0	4.5	30.9	0.3	34.0	13.8
Queue Length 50th (ft)	61	11	0	4	172	15	6	0	23	10
Queue Length 95th (ft)	141	58	m1	20	330	76	20	0	48	108
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2527	1180	307	1880	987	327	417	345	747
Starvation Cap Reductn	0	397	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	0.27	0.45	0.04	0.06	0.56	0.33	0.04	0.03	0.12	0.71

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	568	57	89	638	308	86	560	94	170	451	138
v/c Ratio	0.76	0.45	0.09	0.56	0.68	0.48	0.54	0.68	0.21	0.70	0.42	0.24
Control Delay	62.1	28.6	3.2	60.4	37.6	6.1	60.3	40.4	8.2	60.6	31.3	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.1	28.6	3.2	60.4	37.6	6.1	60.3	40.4	8.2	60.6	31.3	6.5
Queue Length 50th (ft)	133	154	0	57	196	0	55	176	0	105	124	0
Queue Length 95th (ft)	#281	226	12	111	261	47	109	240	35	#207	188	39
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	278	1547	737	278	1547	862	278	1547	744	278	1547	768
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.37	0.08	0.32	0.41	0.36	0.31	0.36	0.13	0.61	0.29	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	852	106	350	774	205	121	867	494	373	1037	364
Future Volume (veh/h)	297	852	106	350	774	205	121	867	494	373	1037	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	300	861	107	354	782	207	122	876	499	377	1047	368
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	967	120	401	886	235	146	1112	518	216	1365	480
Arrive On Green	0.10	0.30	0.30	0.12	0.32	0.32	0.08	0.33	0.33	0.12	0.37	0.37
Sat Flow, veh/h	3456	3181	395	3456	2779	736	1781	3404	1585	1781	3728	1310
Grp Volume(v), veh/h	300	481	487	354	500	489	122	876	499	377	956	459
Grp Sat Flow(s),veh/h/ln	1728	1777	1799	1728	1777	1738	1781	1702	1585	1781	1702	1635
Q Serve(g_s), s	11.6	35.2	35.2	13.7	36.3	36.3	9.2	31.8	42.1	16.5	33.7	33.7
Cycle Q Clear(g_c), s	11.6	35.2	35.2	13.7	36.3	36.3	9.2	31.8	42.1	16.5	33.7	33.7
Prop In Lane	1.00		0.22	1.00		0.42	1.00		1.00	1.00		0.80
Lane Grp Cap(c), veh/h	349	540	547	401	567	554	146	1112	518	216	1246	598
V/C Ratio(X)	0.86	0.89	0.89	0.88	0.88	0.88	0.84	0.79	0.96	1.75	0.77	0.77
Avail Cap(c_a), veh/h	419	581	588	419	581	568	216	1113	518	216	1246	598
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.2	45.2	45.2	59.3	43.9	43.9	61.6	41.6	45.0	59.8	38.0	38.0
Incr Delay (d2), s/veh	12.5	15.7	15.5	18.1	15.0	15.3	11.1	4.1	30.6	354.0	3.1	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	17.5	17.7	6.9	17.9	17.6	4.6	13.8	20.7	28.6	14.4	14.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.7	60.9	60.7	77.3	58.9	59.2	72.7	45.6	75.6	413.8	41.1	44.3
LnGrp LOS	E	E	E	E	E	E	E	D	E	F	D	D
Approach Vol, veh/h		1268			1343			1497			1792	
Approach Delay, s/veh		63.6			63.9			57.8			120.4	
Approach LOS		E			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	48.9	20.0	49.9	19.3	46.9	14.6	55.3
Change Period (Y+Rc), s	3.5	5.5	3.5	5.5	3.5	5.5	3.5	5.5
Max Green Setting (Gmax), s	16.5	44.5	16.5	44.5	16.5	44.5	16.5	44.5
Max Q Clear Time (g_c+I1), s	13.6	38.3	18.5	44.1	15.7	37.2	11.2	35.7
Green Ext Time (p_c), s	0.1	3.8	0.0	0.3	0.0	4.2	0.0	6.7

Intersection Summary		
HCM 6th Ctrl Delay		79.4
HCM 6th LOS		E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1386	946	74	1215	0	36	0	69	0	0	0
Future Volume (veh/h)	7	1386	946	74	1215	0	36	0	69	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	7	1459	996	78	1279	0	38	0	73			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	346	2188	1141	198	3978	0	186	0	165			
Arrive On Green	0.62	0.62	0.62	0.22	1.00	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	432	3554	1585	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	7	1459	996	78	1279	0	38	0	73			
Grp Sat Flow(s),veh/h/ln	432	1777	1585	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.6	24.1	42.6	3.4	0.0	0.0	1.8	0.0	3.9			
Cycle Q Clear(g_c), s	0.6	24.1	42.6	3.4	0.0	0.0	1.8	0.0	3.9			
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	346	2188	1141	198	3978	0	186	0	165			
V/C Ratio(X)	0.02	0.67	0.87	0.39	0.32	0.00	0.20	0.00	0.44			
Avail Cap(c_a), veh/h	346	2188	1141	303	3978	0	394	0	350			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	6.8	11.3	9.5	32.4	0.0	0.0	36.9	0.0	37.9			
Incr Delay (d2), s/veh	0.1	1.6	9.3	0.7	0.2	0.0	0.5	0.0	1.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	8.2	14.0	1.4	0.1	0.0	0.8	0.0	1.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.9	12.9	18.8	33.1	0.2	0.0	37.4	0.0	39.7			
LnGrp LOS	A	B	B	C	A	A	D	A	D			
Approach Vol, veh/h		2462			1357			111				
Approach Delay, s/veh		15.3			2.1			38.9				
Approach LOS		B			A			D				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.7	60.8				75.5		14.5				
Change Period (Y+Rc), s	* 4.7	5.4				5.4		5.1				
Max Green Setting (Gmax), s	* 15	39.6				59.6		19.9				
Max Q Clear Time (g_c+I1), s	5.4	44.6				2.0		5.9				
Green Ext Time (p_c), s	0.1	0.0				18.4		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		11.4
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	1284	30	29	707	262	36	32	28	41	12	564
Future Volume (veh/h)	156	1284	30	29	707	262	36	32	28	41	12	564
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	166	1366	32	31	752	279	38	34	30	44	13	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	2752	1227	315	2167	967	142	108	173	151	36	
Arrive On Green	0.22	1.00	1.00	0.61	0.61	0.61	0.11	0.11	0.11	0.11	0.11	0.00
Sat Flow, veh/h	1781	3554	1585	386	3554	1585	739	994	1585	737	330	1585
Grp Volume(v), veh/h	166	1366	32	31	752	279	72	0	30	57	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	386	1777	1585	1734	0	1585	1068	0	1585
Q Serve(g_s), s	8.0	0.0	0.0	3.1	9.4	7.5	0.0	0.0	1.5	2.7	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0	3.1	9.4	7.5	3.3	0.0	1.5	5.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.53		1.00	0.77		1.00
Lane Grp Cap(c), veh/h	200	2752	1227	315	2167	967	250	0	173	187	0	
V/C Ratio(X)	0.83	0.50	0.03	0.10	0.35	0.29	0.29	0.00	0.17	0.30	0.00	
Avail Cap(c_a), veh/h	501	2752	1227	315	2167	967	428	0	350	348	0	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.1	0.0	0.0	7.4	8.7	8.3	37.2	0.0	36.4	39.0	0.0	0.0
Incr Delay (d2), s/veh	4.5	0.4	0.0	0.6	0.4	0.8	0.6	0.0	0.5	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.2	0.0	0.3	3.2	2.4	1.5	0.0	0.6	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	0.4	0.0	8.1	9.1	9.1	37.8	0.0	36.9	39.9	0.0	0.0
LnGrp LOS	D	A	A	A	A	A	D	A	D	D	A	
Approach Vol, veh/h		1564			1062			102			57	A
Approach Delay, s/veh		4.5			9.1			37.5			39.9	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		75.1		14.9	14.8	60.3		14.9				
Change Period (Y+Rc), s		5.4		5.1	* 4.7	5.4		5.1				
Max Green Setting (Gmax), s		59.6		19.9	* 25	29.6		19.9				
Max Q Clear Time (g_c+I1), s		2.0		7.9	10.0	11.4		5.3				
Green Ext Time (p_c), s		22.1		0.1	0.3	8.3		0.3				

Intersection Summary			
HCM 6th Ctrl Delay			8.2
HCM 6th LOS			A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	1.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	20	19	104	155	3
Future Vol, veh/h	3	20	19	104	155	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	22	21	113	168	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	325	170	171	0	-	0
Stage 1	170	-	-	-	-	-
Stage 2	155	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	669	874	1406	-	-	-
Stage 1	860	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	658	874	1406	-	-	-
Mov Cap-2 Maneuver	658	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	873	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1406	-	838	-	-
HCM Lane V/C Ratio	0.015	-	0.03	-	-
HCM Control Delay (s)	7.6	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	101	1234	5	3	857	27	5	0	11	72	0	103
Future Vol, veh/h	101	1234	5	3	857	27	5	0	11	72	0	103
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	75	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	105	1285	5	3	893	28	5	0	11	75	0	107

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	921	0	0	1290	0	0	1951	2425	645	1766	2413	461
Stage 1	-	-	-	-	-	-	1498	1498	-	913	913	-
Stage 2	-	-	-	-	-	-	453	927	-	853	1500	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	737	-	-	*897	-	-	91	35	*600	*161	36	547
Stage 1	-	-	-	-	-	-	385	373	-	*294	350	-
Stage 2	-	-	-	-	-	-	556	345	-	*565	371	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	737	-	-	*897	-	-	65	30	*600	*140	31	547
Mov Cap-2 Maneuver	-	-	-	-	-	-	65	30	-	*140	31	-
Stage 1	-	-	-	-	-	-	331	320	-	*252	349	-
Stage 2	-	-	-	-	-	-	445	344	-	*475	319	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	28.8	31.3
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	168	737	-	-	* 897	-	-	140	547
HCM Lane V/C Ratio	0.099	0.143	-	-	0.003	-	-	0.536	0.196
HCM Control Delay (s)	28.8	10.7	-	-	9	-	-	57.1	13.2
HCM Lane LOS	D	B	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.3	0.5	-	-	0	-	-	2.6	0.7

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
6: Carson Street & Wilmington Avenue

01/13/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	897	64	50	482	116	95	377	100	216	673	229
Future Volume (veh/h)	108	897	64	50	482	116	95	377	100	216	673	229
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	115	954	68	53	513	123	101	401	106	230	716	244
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	144	1279	570	67	1125	502	128	777	346	265	1049	468
Arrive On Green	0.08	0.37	0.37	0.04	0.32	0.32	0.07	0.22	0.22	0.15	0.30	0.30
Sat Flow, veh/h	1739	3469	1547	1739	3469	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	115	954	68	53	513	123	101	401	106	230	716	244
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1739	1735	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	5.7	21.0	2.5	2.7	10.3	5.1	5.0	8.9	5.0	11.3	15.9	11.4
Cycle Q Clear(g_c), s	5.7	21.0	2.5	2.7	10.3	5.1	5.0	8.9	5.0	11.3	15.9	11.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	144	1279	570	67	1125	502	128	777	346	265	1049	468
V/C Ratio(X)	0.80	0.75	0.12	0.79	0.46	0.25	0.79	0.52	0.31	0.87	0.68	0.52
Avail Cap(c_a), veh/h	317	1761	785	317	1761	785	317	1761	785	317	1761	785
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	24.1	18.3	41.8	23.5	21.7	40.0	29.9	28.4	36.3	26.9	25.3
Incr Delay (d2), s/veh	3.8	1.5	0.1	7.5	0.4	0.4	4.1	0.8	0.7	17.3	1.1	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	8.2	0.9	1.2	4.0	1.8	2.2	3.6	1.8	5.9	6.3	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.3	25.6	18.4	49.3	23.9	22.1	44.0	30.6	29.1	53.6	28.0	26.6
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1137			689			608			1190	
Approach Delay, s/veh		27.0			25.5			32.6			32.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	37.8	10.4	32.0	11.3	33.9	17.3	25.1
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	16.0	44.5	16.0	44.5	16.0	44.5	16.0	44.5
Max Q Clear Time (g_c+I1), s	4.7	23.0	7.0	17.9	7.7	12.3	13.3	10.9
Green Ext Time (p_c), s	0.0	9.3	0.0	8.6	0.0	5.7	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	29.5
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	300	968	354	989	122	1375	377	1415
v/c Ratio	0.81	0.91	0.89	0.91	0.74	0.89	1.76	0.85
Control Delay	76.9	58.1	84.2	57.0	86.1	49.3	395.2	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.9	58.1	84.2	57.0	86.1	49.3	395.2	46.0
Queue Length 50th (ft)	138	440	165	447	110	407	~515	422
Queue Length 95th (ft)	190	#561	#251	#579	177	473	#719	#509
Internal Link Dist (ft)		543		632		486		619
Turn Bay Length (ft)	225		210		140		145	
Base Capacity (vph)	416	1105	416	1112	214	1592	214	1668
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.88	0.85	0.89	0.57	0.86	1.76	0.85

Intersection Summary

~ 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	7	1459	996	78	1279	38	73
v/c Ratio	0.03	0.71	0.71	0.38	0.35	0.15	0.24
Control Delay	11.4	17.2	5.0	45.2	3.5	33.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	17.2	5.0	45.2	3.5	33.2	7.6
Queue Length 50th (ft)	2	278	50	46	49	20	0
Queue Length 95th (ft)	10	#542	167	m76	106	43	28
Internal Link Dist (ft)		349			384		
Turn Bay Length (ft)	45			55			
Base Capacity (vph)	230	2064	1459	300	3639	391	417
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.71	0.68	0.26	0.35	0.10	0.18

Intersection Summary

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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	166	1366	32	31	752	279	72	30	57	600
v/c Ratio	0.62	0.56	0.03	0.16	0.43	0.29	0.29	0.09	0.25	0.85
Control Delay	57.1	4.2	1.2	18.3	16.2	3.1	34.1	0.5	33.5	18.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.1	4.2	1.2	18.3	16.2	3.1	34.1	0.5	33.5	18.3
Queue Length 50th (ft)	103	73	0	9	128	0	37	0	29	36
Queue Length 95th (ft)	m148	96	m0	34	223	46	71	0	60	#175
Internal Link Dist (ft)		384			608		543		472	
Turn Bay Length (ft)	70			100		160		20		225
Base Capacity (vph)	497	2461	1148	190	1758	949	340	419	308	763
Starvation Cap Reductn	0	130	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	0.33	0.59	0.03	0.16	0.43	0.29	0.21	0.07	0.19	0.79

Intersection Summary

\# 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	954	68	53	513	123	101	401	106	230	716	244
v/c Ratio	0.64	0.78	0.11	0.43	0.51	0.23	0.59	0.47	0.23	0.84	0.67	0.42
Control Delay	66.8	37.8	5.0	65.1	33.8	7.0	65.7	36.2	7.5	73.9	37.6	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.8	37.8	5.0	65.1	33.8	7.0	65.7	36.2	7.5	73.9	37.6	14.8
Queue Length 50th (ft)	79	305	0	37	148	0	69	127	0	162	237	47
Queue Length 95th (ft)	163	498	26	90	254	47	146	188	42	#405	351	130
Internal Link Dist (ft)		337			604			581			494	
Turn Bay Length (ft)	195		180	195		445	295		220	210		135
Base Capacity (vph)	275	1530	730	275	1530	752	275	1530	743	275	1530	771
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.62	0.09	0.19	0.34	0.16	0.37	0.26	0.14	0.84	0.47	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX E: MEMORANDUM OF UNDERSTANDING

Memorandum

Date: December 13, 2021

To: Ryan Kim and Nick Lowe, City of Carson
CC: Stefanie Edmondson, City of Carson
Darren Embry, Faring

From: Drew Heckathorn and Michael Kennedy, Fehr & Peers

Subject: 21611 South Perry Street Self-Storage/Mixed-Use Project Traffic Study Methodology and Assumptions

LB21-0049

This document summarizes the methodology and assumptions for the study to address transportation analysis requirements and potential improvements for the 21611 South Perry Street Self-Storage/Mixed-Use project in the City of Carson.

Overall Methodology

The assessment of the proposed project will involve evaluating intersection level of service (LOS) and queueing for the following scenarios during weekday AM and PM peak hour conditions:

- Existing
- Existing plus Ambient Growth with Project
- Future Base
- Future with Project

Any adverse project traffic effects will be defined by comparing Existing LOS to Existing plus Ambient Growth with Project LOS and Future Base LOS to Future with Project LOS for weekday AM and PM peak periods. Specific LOS methodology and thresholds are defined below.

LOS Methodology

All study intersections will be analyzed using the Highway Capacity Manual (HCM), 6th Edition method.

Project Traffic Threshold

Study intersections will be considered adversely affected if the project's traffic would contribute to unacceptable queuing, defined as:

- Spill over from turn pockets into through lanes
- Spill over into intersections

Existing Conditions

Existing Transportation Network

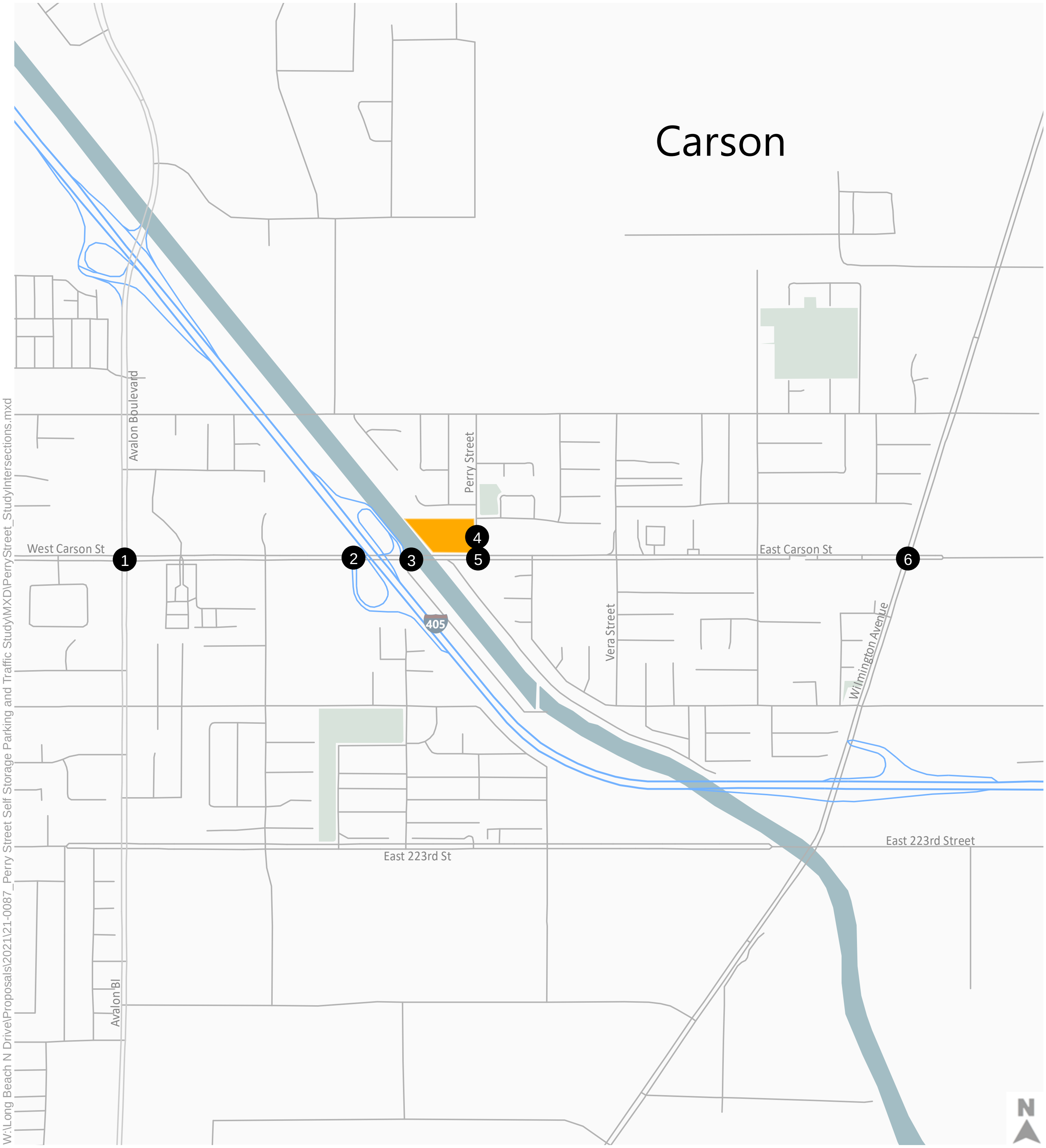
The study report will include a description of the following existing transportation network elements:

- Freeway and street characteristics within the study area
- Pedestrian infrastructure within ¼ mile of the project site
- Bicycle infrastructure within 2 miles of the project site
- Transit available within ¼ mile of the project site

Existing Traffic Volumes

Recent traffic studies in the City of Carson will be reviewed to determine if there are available turning movement count data at any of the proposed study intersections. Due to significant changes in travel behavior caused by the COVID-19 pandemic, this study will utilize AM and PM peak hour traffic counts collected in the year prior to the start of the pandemic (March 2019-March 2020). If pre-pandemic counts are not available at any location, new AM and PM peak hour traffic counts will be collected. If appropriate, an adjustment factor will be applied to the new counts to estimate pre-pandemic traffic levels. The list of study intersections is shown below and in **Figure 1**:

1. Avalon Boulevard & Carson Street
2. I-405 Southbound Ramps & Carson Street
3. I-405 Northbound Ramps & Carson Street
4. Perry Street & Proposed Project Driveway (Future Intersection)
5. Perry Street & Carson Street
6. Wilmington Avenue & Carson Street



Cities

Study Intersections

Proposed Project Site

Figure 1

Study Intersections

Existing Plus Ambient Growth Conditions

Existing plus Ambient Growth volumes will account for ambient growth in the study area up to the project buildout year. Specific assumptions are listed below:

- Project Buildout Year – 2023
- Ambient linear growth factor – 0.5% per year (for a total of 2% over 4 years)

Future Base Conditions

The Future Base volumes will account for the Existing plus Ambient Growth volumes and trips associated with known related projects and any planned network changes. Related projects are shown in **Table 1** and **Figure 2** (list of projects provided by the City of Carson).

Project Description

The project as analyzed will include:

- Self-Storage Warehouse 109,039 square feet (725 storage units)
    - Self-Storage Office 2,425 square feet
- Retail Space 700 square feet
- Restaurant Space 1,550 square feet

Project Trip Generation

The total trip generation for the project is based on ITE rates with credits for internal capture and pass-by informed by NCHRP internal capture guidelines and ITE data for pass-by credits. Trip generation rates and credits are shown in **Table 2**.

Trip Distribution

The geographic trip distribution of the project trips is based on several factors including the type and density of the proposed land uses, the geographic distribution of population and activity centers in the surrounding area, and the location of the project access points in relation to the surrounding street and freeway system.

Figure 3 illustrates the trip distribution pattern of the project trips.

Other Traffic and Parking Study Components

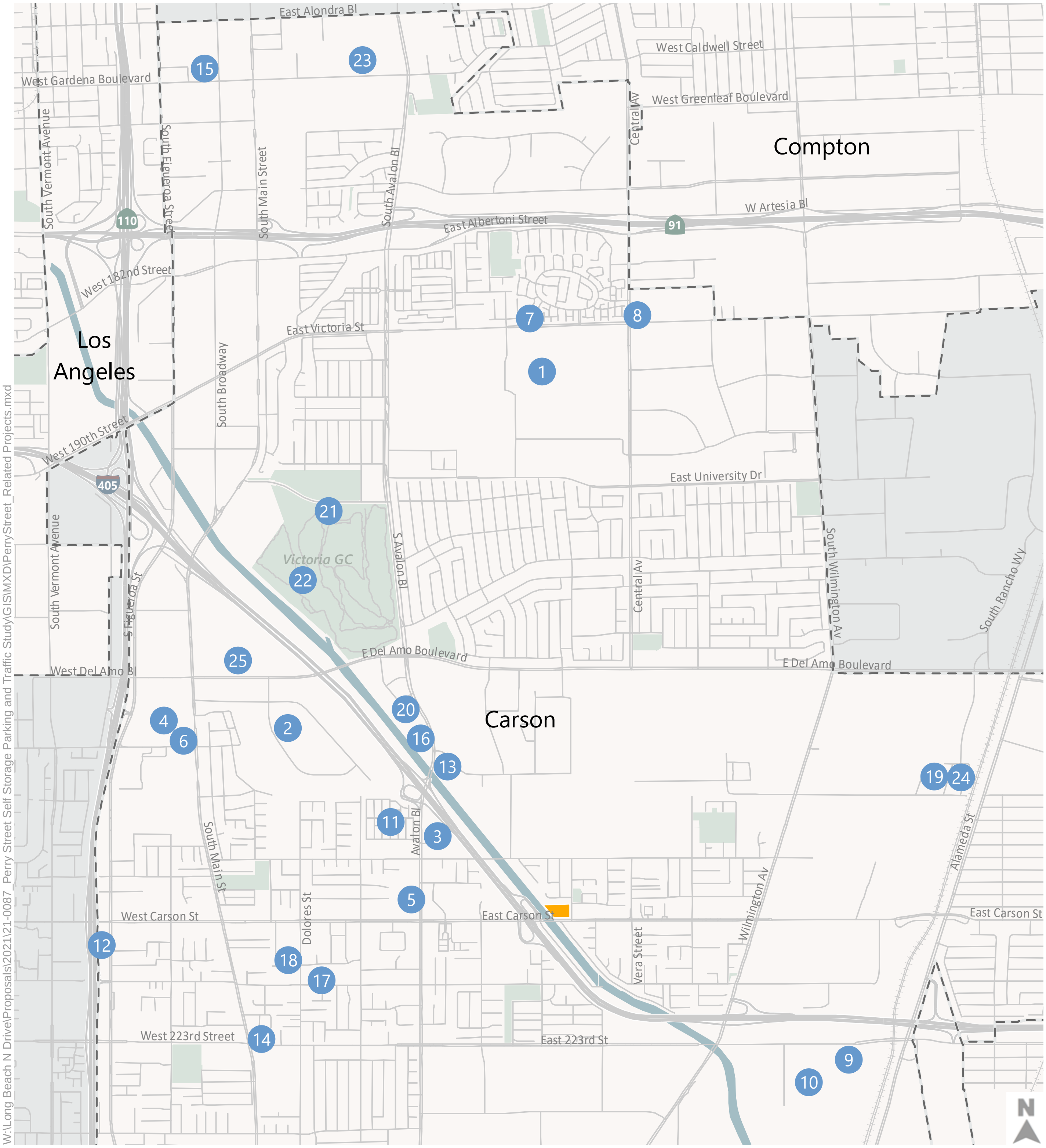
Site Access Analysis

This analysis will involve a review of the project's proposed access including an analysis of driveways and pedestrian entry points.

TABLE 1
PERRY STREET SELF STORAGE PROJECT
RELATED PROJECTS

No.	Project Location	Land Use	Size		Trip Generation						
					Daily	AM			PM		
						IN	OUT	TOTAL	IN	OUT	TOTAL
1	CSUDH Master Plan	Mixed Use	[1]	[1]	N/A	2,299	1,415	3,714	1,940	2,286	4,226
2	The District at South Bay	Mixed Use	[1]	[1]	42,791	1,490	1,349	2,838	1,809	1,997	3,805
3	21212 Avalon Blvd	Mixed Use	[1]	[1]	9,779	171	347	518	391	268	659
4	20601 S Main St	Industrial Park	267	ksf	900	87	20	107	22	85	107
5	Union South Bay (21521 S Avalon Blvd)	Multifamily	357	du	3,685	54	156	210	199	137	335
		Shopping	31	ksf							
6	225 W Torrance Blvd	Multifamily	356	du	1,937	33	95	128	96	61	157
7	1007 E Victoria St	Multifamily	35	du	278	4	13	17	13	8	21
8	NEC Victoria and Central	Multifamily	175	du	1,281	19	62	81	62	36	98
9	2254 E 223rd St	Warehousing	121	ksf	429	29	8	36	10	29	39
10	2112 E 223rd St	Warehousing	292	ksf	507	38	12	50	14	41	55
11	21207 Avalon Blvd	Mixed Use	[1]	[1]	5,586	125	277	402	283	174	457
12	21809-21811 S Figueroa St	Multifamily	32	du	234	3	11	14	11	7	18
13	888 E Dominguez St	Hotel	118	keys	905	32	22	54	36	35	71
14	123 E 223rd st	Multifamily	10	du	36	2	1	3	1	2	3
15	333 W Gardena Blvd	Warehousing	146	ksf	276	19	6	25	7	21	28
16	20707 Avalon Blvd	Retail	3	ksf	608	26	26	52	22	20	42
17	345/349 E 220th St	Multifamily	35	du	256	4	12	16	12	7	19
18	21915 S Dolores St	Multifamily	5	du	37	1	2	3	2	2	4
19	2315 E Dominguez St	Warehousing	14	ksf	68	1	1	2	1	2	3
20	20501 Avalon Blvd	Retail	5	ksf	1,013	44	43	86	37	34	70
21	Carol Kimmelman Campus	Mixed Use	[1]	[1]	3,808	105	83	188	244	192	436
22	Creek Dominguez Hills	Mixed Use	[1]	[1]	16,132	580	384	964	727	669	1,396
23	439 E Gardena Blvd	Warehousing	4	ksf	52	1	0	1	0	1	1
24	20950 Brant Ave	Retail	4	ksf	151	2	2	4	7	8	15
25	20330 S Main St	Multifamily	300	du	1,580	27	109	136	84	45	129
				Total	92,329	5,196	4,456	9,649	6,030	6,167	12,194

Notes:
du = dwelling unit
ksf = one thousand square feet
[1] Mixed Use developments contain more than one independent variable to calculate trip generation.
Related projects list is based on information provided by the City of Carson, the County of Los Angeles, publicly available environmental documentation, and trip generation rates contained in ITE Trip Generation, 10th Edition.



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Proposed Project Site

Cities

Related Projects

Figure 2

Related Projects

TABLE 2
PERRY STREET SELF-STORAGE PROJECT
ESTIMATED PROJECT TRIP GENERATION

Land Use	ITE Land Use Code	Size	Trip Generation Rates [a]							Estimated Trip Generation						
				AM Peak Hour			PM Peak Hour				AM Peak Hour Trips			PM Peak Hour Trips		
			Daily	Rate	In%	Out%	Rate	In%	Out%	Daily	In	Out	Total	In	Out	Total
PROPOSED PROJECT																
Mini-Warehouse	151	7 Units (100s)	17.96	1.21	51%	49%	1.68	50%	50%	130	5	4	9	6	6	12
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [b]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net External Vehicle Trips										130	5	4	9	6	6	12
Coffee/Donut Shop without Drive-Through Window [c]	936	1.55 KSF	450.49	93.08	51%	49%	32.29	50%	50%	698	73	71	144	25	25	50
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [b]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Driveway Trips										698	73	71	144	25	25	50
Less: Pass-by			*43%*	*43%*			*43%*			*(300)*	*(31)*	*(31)*	*(62)*	*(11)*	*(11)*	*(22)*
Net External Vehicle Trips										398	42	40	82	14	14	28
Copy, Print, and Express Ship Store [d]	920	0.7 KSF	74.2	2.78	75%	25%	7.42	44%	56%	52	2	0	2	2	3	5
Less: Internal capture			*0%*		*0%*	*0%*		*0%*	*0%*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Less: Walk/Bike/Transit Credit [b]			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Driveway Trips										52	2	0	2	2	3	5
Less: Pass-by			*0%*	*0%*			*0%*			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net External Vehicle Trips										52	2	0	2	2	3	5
TOTAL DRIVEWAY TRIPS										880	80	75	155	33	34	67
TOTAL PROJECT EXTERNAL VEHICLE TRIPS										580	49	44	93	22	23	45
EXISTING USE CREDIT																
Vacant Lot	-		-	-	-	-	-	-	-	0	0	0	0	0	0	0
TOTAL EXISTING DRIVEWAY TRIPS										0	0	0	0	0	0	0
NET INCREMENTAL EXTERNAL TRIPS										580	49	44	93	22	23	45

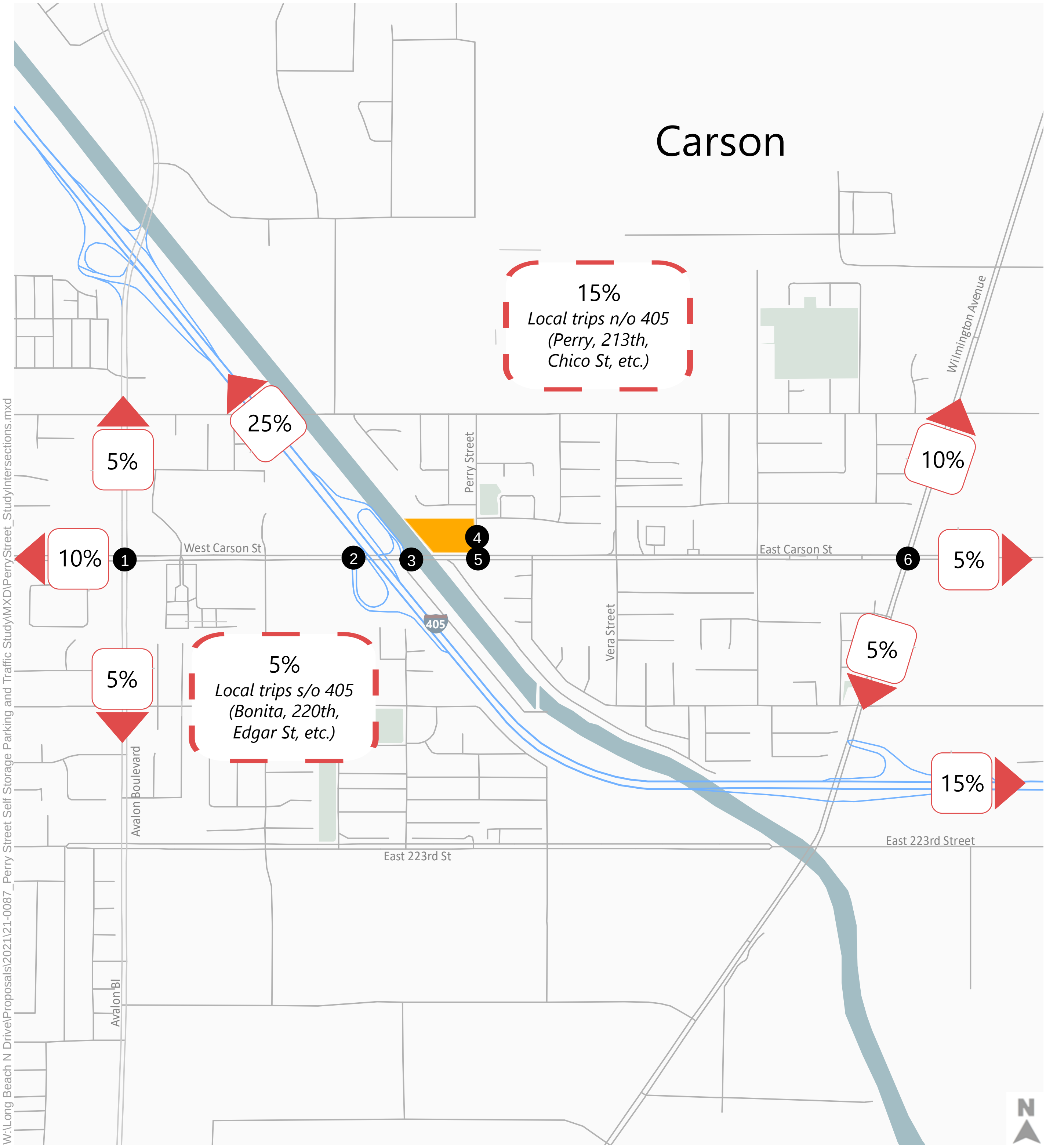
Notes:

[a] Source: Institute of Transportation Engineers (ITE), *Trip Generation, 11th Edition* , 2021

[b] A 0% Walk/Bike/Transit Credit was used based on the site's general suburban context.

[c] ITE use 933 - Fast-Food Restaurant without Drive-Through Window used for daily rate due to lack of daily rate data for ITE use 936 - Coffee/Donut Shop without Drive-Through Window.

[d] ITE use 920 does not have a daily rate. The daily rate is estimated to be 10 times greater than the PM peak hour traffic volume for the use.



Cities
Study Intersections
Proposed Project Site
Local Trip Distribution
Trip Distribution

Figure 3

Trip Distribution

Parking Demand Analysis

This analysis will assess if the proposed on-site parking supply is adequate to accommodate peak parking demand. In addition to estimating peak parking demand, the analysis will consider potential spillover effects into adjacent residential neighborhoods, shared parking efficiencies, and TDM strategies.

The parking demand analysis will include a summary of minimum parking requirements for the project based on the Carson Municipal Code. The analysis will then consider national best practice standards, such as the ITE *Parking Generation* manual and ULI *Shared Parking* manual, to see if lower parking ratios can be justified given the project's land use types and local context. The ULI *Shared Parking* methodology will also be utilized to determine shared parking efficiencies through complementary on-site land uses (i.e., land uses with peak parking demand occurring at different times of day or season).

Potential Improvements

Any adverse effects of project traffic on the study intersections will be identified. If the project traffic creates adverse effects (according to the City of Carson guidelines described in the Project Traffic Threshold section of this memorandum), physical and/or operational improvements necessary to accommodate project trips will be investigated and defined at a conceptual level.

VMT Analysis

The proposed project can be classified as local-serving retail, and therefore based on standard OPR guidance can screen out from conducting VMT analysis for CEQA purposes. As described in the OPR technical advisory: "By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT." This approach will be described qualitatively in any environmental documents necessary for the project.