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Noise Analysis for the California Terraces Planning Area 61 Project San Diego, California

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List of Acronyms and Abbreviations

Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of San Diego
CNEL	community noise equivalent level
CPU	Community Plan Update
dB	decibel
dB(A)	A-weighted decibel
FPEIR	Final Program Environmental Impact Report
FHWA	Federal Highway Administration
MSCP	Multiple Species Conservation Program
HVAC	heating, ventilation, and air conditioning
L_{eq}	one-hour equivalent noise level
LOS	Level of Service
L_{pw}	sound power level
MHPA	Multi-Habitat Planning Area
PA	Planning Area
project	California Terraces Planning Area 61 Project
SEL	sound exposure level
SR-905	State Route 905

Executive Summary

The California Terraces Planning Area (PA) 61 project (project) site is located north of State Route 905 (SR-905) and southeast of the intersection of Otay Mesa Road and Ocean View Hills Parkway/Caliente Avenue in the Otay Mesa Community Plan area, in the city of San Diego, California. The project site is currently undeveloped. The project would construct up to 267 multi-family units, a 0.19-acre park, and up to 45,000 square feet of commercial uses on an approximately 14.6-acre site. The residential development potential on the project site would be 15 to 19 dwelling units per acre, for a total of up to 267 units.

The project is located within the Otay Mesa Community Plan Update (CPU) area. Noise impacts associated with the Otay Mesa CPU were addressed in the Final Program Environmental Impact Report for the Otay Mesa CPU (FPEIR; Project Number 30330/304032, SCH No. 2004651076) approved by the City of San Diego (City) in 2013 (City of San Diego 2013). The FPEIR identified a mitigation framework that is applicable to the project, including demonstrating the exterior and interior noise levels for residential uses would not exceed the compatibility standards of the City's General Plan. This report discusses potential noise impacts from the construction and operation of the project, and implements the Otay Mesa CPU mitigation framework, as necessary. As part of this assessment, noise levels due to vehicle traffic were calculated and evaluated against City of San Diego noise and land use compatibility guidelines. In addition to compatibility, the potential for noise to impact adjacent receivers from future on-site sources and construction activity was assessed. Where impacts were identified, measures have been identified to comply with the City's noise standards. A summary of the findings is provided below.

Construction Noise

Project construction noise would be generated by diesel engine-driven construction equipment used for site preparation and grading, building construction, loading, unloading, and placing materials and paving. Construction noise would potentially result in short-term impacts to surrounding properties. The project site is bound by multi-family uses to the north, SR-905 and open space to the south, San Ysidro High School to the southwest, and open space to the east and west. Additionally, Multi-Habitat Planning Area (MHPA) habitat is located northeast of the project site. The construction noise level limit at residential uses is 75 A-weighted decibels (dB(A)) one-hour equivalent noise level (L_{eq}). In addition, for occupied MHPA, although no formal standards have been issued by any agencies, a precedent set over many years is that noise sources associated with projects should not result in noise levels that exceed 60 dB(A) L_{eq} or the existing ambient noise level if greater than 60 dB(A) L_{eq} during the breeding season of federally listed threatened or endangered bird species known to occupy the MHPA lands.

As calculated in this analysis, construction noise levels are not anticipated to exceed 75 dB(A) Leq at the adjacent or on-site residential uses, or 60 dB(A) Leq at the adjacent MHPA habitat. Although the existing adjacent residences and MHPA would be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary. Additionally, construction activities are not anticipated to exceed 75 dB(A)Leq. Therefore, construction activities would result in less than significant noise impacts.

Vehicle Traffic Noise

On-site Noise Compatibility

The main source of noise at the project site is vehicle traffic on SR-905, Otay Mesa Road, Caliente Avenue, and SR-905 on- and off-ramps. As required by Otay Mesa CPU FPEIR mitigation measure NOI-1, this site-specific noise analysis calculates exterior noise levels and analyzes noise reduction measures, as necessary, to demonstrate that future noise would not exceed the residential noise compatibility standards of the General Plan. Multi-family residential uses are "compatible" with exterior noise levels up to 60 community noise equivalent level (CNEL), and "conditionally compatible" with exterior noise levels up to 70 CNEL. In "conditionally compatible" areas, feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable, and building structures must attenuate exterior noise levels to an indoor noise level of 45 CNEL. The exterior compatibility standard is applicable at the proposed exterior use areas. In the case of the proposed project, exterior use areas include the balconies.

Additionally, for the non-residential components of the project, the exterior noise level limit for park uses is 65 CNEL, and the exterior noise level limit for commercial and retail uses is 75 CNEL with an interior noise level standard of 50 CNEL (City of San Diego 2016).

As calculated in this analysis, noise levels at the proposed park would be 62 CNEL, which would be compatible with the City's standard of 65 CNEL, and noise levels at the perimeter of the commercial lot would range from 68 to 74 CNEL, which would be compatible with the City's commercial standard of 75 CNEL.

Exterior noise levels were modeled at each proposed balcony location. Balcony noise levels are projected to exceed the "conditionally compatible" noise level of 70 CNEL at 27 of the balconies facing Otay Mesa Road and SR-905. Therefore, the project includes noise attenuating design measures in the form of a solid 3.5-foot balcony wall extending the length/perimeter of the balcony on the 27 balconies. The inclusion of the noise walls would ensure that the project would be consistent with City regulations associated with exterior noise levels. With construction of a solid 3.5-foot balcony wall, balcony noise levels would be reduced to 70 CNEL or less at all balconies. The following specific design parameters would be required:

Exterior noise levels at the 27 balconies identified on Figure 8 shall be constructed with a solid 3.5-foot balcony wall extending the length/perimeter of the balcony. The sound attenuation wall must be solid and free of cracks or holes. It can be constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, as long as there are no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least one-inch total thickness or have a density of at least 3.5 pounds per square foot.

The inclusion of the noise walls would ensure that the project would be consistent with City regulations associated with exterior noise levels. The interior noise level standard for commercial uses is 50 CNEL. No site or building design is available for the commercial lot at this time. However, assuming light-frame construction, interior noise levels would be reduced to 49 CNEL. Thus, interior noise levels in the commercial buildings would be compatible with City standards.

The interior noise level standard for residential uses is 45 CNEL. A noise reduction of up to 30 decibels (dB) would be required to achieve an interior noise level of 45 CNEL or less. As required by NOI-2 of the Otay Mesa CPU FPEIR, prior to the issuance of building permits, a site-specific interior noise analysis would be prepared demonstrating that the window, door, and wall components would achieve a necessary sound transmission class rating required to reduce interior noise levels to 45 CNEL or less. With implementation of this existing mitigation framework, interior noise impacts would be less than significant.

Off-site Vehicle Traffic Noise

The project would increase traffic volumes on local roadways. However, the project would not substantially alter the vehicle classifications mix on local or regional roadways nor would the project alter the speed on an existing roadway or create a new roadway. Thus, the primary factor affecting off-site noise levels would be increased traffic volumes. A substantial noise increase is defined as an increase of 3 dB above existing conditions as stated in the City's CEQA significance standards.

As calculated in this analysis, direct off-site noise level increases due to the project would be less than 1 dB. Therefore, direct off-site noise impacts associated with the project would be less than significant. The total horizon (year 2062) with project increase over the existing condition would range from less than 1 dB to 6 dB. However, the project's contribution to the increase over ambient noise levels would be less than 1 dB. Therefore, the project would result in a less than cumulatively considerable off-site noise level increase, and cumulative traffic noise impacts associated with the project would be less than significant.

On-site Generated Noise

The noise sources on the project site after completion of construction are anticipated to be those that would be typical of any residential complex, such as vehicles arriving and leaving, children at play, and landscape maintenance machinery. None of these noise sources is anticipated to violate the City's Noise Abatement and Control Ordinance or result in a substantial permanent increase in existing noise levels. However, the project would include rooftop heating, ventilation, and air conditioning (HVAC) units that have the potential to produce noise in excess of City limits. Rooftop HVAC noise levels were modeled at the adjacent property lines. On-site generated noise levels would range from 33 to 38 dB(A) L_{eq} at the property lines, which would be less than the most restrictive multi-family noise level limit of 45 dB(A) L_{eq}. Noise levels would not exceed the applicable Noise Abatement and Control Ordinance limits at the property lines.

1.0 Introduction

1.1 Project Description

The California Terraces Planning Area (PA) 61 project (project) site is located north of State Route 905 (SR-905), southeast of the intersection of Otay Mesa Road and Ocean View Hills Parkway/Caliente Avenue in the Otay Mesa Community Plan area, in the city of San Diego, California. Figure 1 shows the regional location. An aerial photograph of the project site and vicinity is shown in Figure 2. The project site is bounded by multi-family uses to the north, SR-905 and open space to the south, San Ysidro High School to the southwest, and vacant land to the east and west. The project site is currently undeveloped. The project would construct up to 267 multi-family units, a 0.19-acre park, and up to 45,000 square feet of commercial uses on an approximately 14.6-acre site. The residential development potential on the project site would be 15 to 19 dwelling units per acre, for a total of up to 267 units. Figure 3 shows the proposed site plan.

1.2 Fundamentals of Noise

Sound levels are described in units called the decibel (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease.

Additionally, in technical terms, sound levels are described as either a "sound power level" or a "sound pressure level," which while commonly confused are two distinct characteristics of sound. Both share the same unit of measure, the dB. However, sound power, expressed as L_{pw}, is the energy converted into sound by the source. The L_{pw} is used to estimate how far a noise will travel and to predict the sound levels at various distances from the source. As sound energy travels through the air, it creates a sound wave that exerts pressure on receivers such as an eardrum or microphone and is the sound pressure level. Noise measurement instruments only measure sound pressure, and noise level limits used in standards are generally sound pressure levels.

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the "A-weighted" noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A-weighted measurements are designated with the notation dB(A).

Project Location

FIGURE 1

Regional Location

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Image Source: NearMaps (flown June 2018)

FIGURE 2

Project Location on Aerial Photograph

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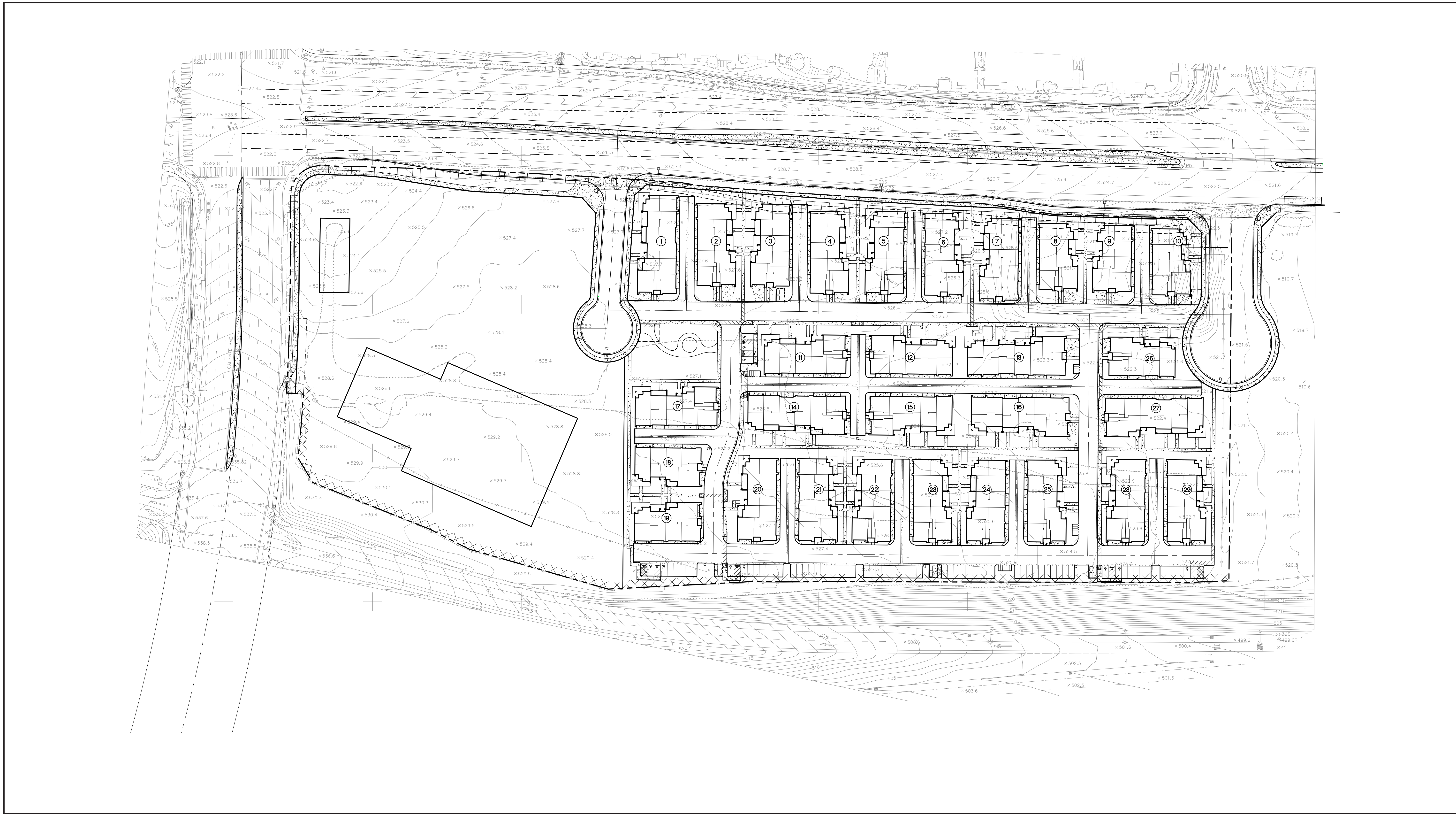
Map Source: CivilSense, Inc.



0 Feet 100

FIGURE 3
Site Plan

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The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. The noise descriptors used for this study are the one-hour equivalent noise level (L_{eq}), the community noise equivalent level (CNEL), and the sound exposure level (SEL). The CNEL is a 24-hour equivalent sound level. The CNEL calculation applies an additional 5 dB(A) penalty to noise occurring during evening hours, between 7:00 p.m. and 10:00 p.m., and an additional 10 dB(A) penalty is added to noise occurring during the night, between 10:00 p.m. and 7:00 a.m. These increases for certain times are intended to account for the added sensitivity of humans to noise during the evening and night. The SEL is a noise level over a stated period of time or event and normalized to one second.

Sound from a small, localized source (approximating a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level decreases or drops off at a rate of 6 dB(A) for each doubling of the distance.

Traffic noise is not a single, stationary point source of sound. The movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The drop-off rate for a line source is 3 dB(A) for each doubling of distance.

The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site (such as parking lots or smooth bodies of water) receives no additional ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. A soft site (such as soft dirt, grass, or scattered bushes and trees) receives an additional ground attenuation value of 1.5 dB(A) per doubling of distance. Thus, a point source over a soft site would attenuate at 7.5 dB(A) per doubling of distance.

Human perception of noise has no simple correlation with acoustical energy. A change in noise levels is generally perceived as follows: 3 dB(A) barely perceptible, 5 dB(A) readily perceptible, and 10 dB(A) perceived as a doubling or halving of noise (Caltrans 2013).

2.0 Applicable Standards

2.1 Otay Mesa Community Plan Update Mitigation Framework

Noise impacts associated with the Otay Mesa Community Plan Update (CPU) were addressed in the Final Program Environmental Impact Report for the Otay Mesa CPU FPEIR (FPEIR; Project Number 30330/304032, SCH No. 2004651076) approved by the City of San Diego in 2013 (City of San Diego 2013).

The following mitigation framework applies to the project:

Traffic Generated Noise Impacts

NOI-1: Prior to the issuance of building permits, site-specific exterior noise analyses that demonstrate that the project would not place residential receptors in locations where the exterior existing or future noise levels would exceed the noise compatibility standards of the City's General Plan shall be required as part of the review of future residential development proposals. Noise reduction measures, including but not limited to building noise barriers, increased building setbacks, speed reductions on surrounding roadways, alternative pavement surfaces, or other relevant noise attenuation measures, may be used to achieve the noise compatibility standards. Exact noise mitigation measures and their effectiveness shall be determined by the site-specific exterior noise analyses.

NOI-2: Prior to the issuance of building permits, site-specific interior noise analyses demonstrating compliance with the interior noise compatibility standards of the City's General Plan and other applicable regulations shall be prepared for noise sensitive land uses located in areas where the exterior noise levels exceed the noise compatibility standards of the City's General Plan. Noise control measures, including but not limited to increasing roof, wall, window, and door sound attenuation ratings, placing heating, ventilation, and air conditioning (HVAC) in noise reducing enclosures, or designing buildings so that no windows face freeways or major roadways may be used to achieve the noise compatibility standards. Exact noise mitigation measures and their effectiveness shall be determined by the site-specific exterior noise analyses.

Stationary Source Noise

NOI-3: Prior to the issuance of a building permit, a site-specific acoustical/noise analysis of any on-site generated noise sources, including generators, mechanical equipment, and trucks, shall be prepared which identifies all noise-generating equipment, predicts noise levels at property lines from all identified equipment, and recommends mitigation to be implemented (e.g., enclosures, barriers, site orientation), to ensure compliance with the City's Noise Abatement and Control Ordinance. Noise reduction measures shall include building noise-attenuating walls, reducing noise at the source by requiring quieter machinery or limiting the hours of operation, or other attenuation measures. Additionally, future projects shall be required to buffer sensitive receptors from noise sources through the use of open space and other separation techniques as recommended after thorough analysis by a qualified acoustical engineer. Exact noise mitigation measures and their effectiveness shall be determined by the site-specific noise analyses.

Construction Noise

NOI-4: For projects that exceed daily construction noise thresholds established by the City of San Diego, best construction management practices shall be used to reduce construction noise levels to comply with standards established by the Municipal Code in Chapter 5, Article 9.5, Noise Abatement and Control. The project applicant shall prepare and implement a Construction Noise Management Plan. Appropriate management practices shall be determined on a project-by-project basis and are specific to the location. Control measures shall include:

a. Minimizing simultaneous operation of multiple construction equipment units;

b. Locating stationary equipment as far as reasonable from sensitive receptors;

c. Requiring all internal combustion-engine-driven equipment to be equipped with mufflers that are in good operating condition and appropriate for the equipment; and

d. Construction of temporary noise barriers around construction sites that block the line-of-sight to surrounding receptors.

In addition, the FPEIR indicates that impacts from noise and construction activity resulting from future development under the CPU would occur if construction occurs during the raptor or migratory bird nesting season. Mitigation Measure LU-2 requires future development to comply with Land Use Adjacency Guidelines of the Multiple Species Conservation Program (MSCP) in terms of noise. The U.S. Fish and Wildlife Service and other resource agencies, such as the U.S. Army Corps of Engineers and California Department of Fish and Wildlife, require limitation of noise levels to the habitats of threatened and endangered birds, such as the light-footed Ridgway's rail. Although no formal standards have been issued by these agencies, the precedent set over many years is that projects shall not result in noise levels that exceed 60 dB(A) L_{eq}, or the existing ambient noise level if greater than 60 dB(A) L_{eq}, at designated habitat or a known nesting site for a federally listed threatened or endangered bird species during the breeding season. Based on this precedent, during the breeding seasons, the City requires that noise levels generated by a project shall not exceed 60 dB(A) L_{eq} at the edge of the occupied habitat or the existing ambient level if the ambient level is above 60 dB(A) L_{eq} (City of San Diego 2012).

2.2 City of San Diego General Plan

The City's Noise Element of the General Plan specifies compatibility standards for different land use categories (Table 1). Multi-family residential uses are considered "compatible" with exterior noise levels up to 60 CNEL and "conditionally compatible" with exterior noise levels up to 70 CNEL. The City's interior noise level standard for all residential uses is 45 CNEL. Commercial and retail uses are considered "compatible" with exterior noise levels up to 65 CNEL and "conditionally compatible" with exterior noise levels up to 75 CNEL, with an interior noise level standard of 50 CNEL. Park uses are considered "compatible" with exterior noise levels up to 70 CNEL and "conditionally compatible" with exterior noise levels up to 75 CNEL.

Table 1
City of San Diego Land Use – Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure [dB(A) CNEL]				
	60	65	70	75	
Parks and Recreational					
Parks, Active and Passive Recreation					
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities					
Agricultural					
Crop Raising and Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries and Greenhouses; Animal Raising, Maintaining and Keeping; Commercial Stables					
Residential					
Single Dwelling Units; Mobile Homes		45			
Multiple Dwelling Units **For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.*		45	45		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12 Educational Facilities; Libraries; Museums; Child Care Facilities		45			
Other Educational Facilities including Vocational/Trade Schools and Colleges and Universities		45	45		
Cemeteries					
Retail Sales					
Building Supplies/Equipment; Food, Beverage, and Groceries; Pets and Pet Supplies; Sundries, Pharmaceutical, and Convenience Sales; Wearing Apparel and Accessories			50	50	
Commercial Services					
Building Services; Business Support; Eating and Drinking; Financial Institutions; Maintenance & Repair; Personal Services; Assembly and Entertainment (includes public and religious assembly); Radio and Television Studios; Golf Course Support			50	50	
Visitor Accommodations		45	45	45	
Offices					
Business and Professional; Government; Medical, Dental, and Health Practitioner; Regional and Corporate Headquarters			50	50	
Vehicle and Vehicular Equipment Sales and Services Use					
Commercial or Personal Vehicle Repair and Maintenance; Commercial or Personal Vehicle Sales and Rentals; Vehicle Equipment and Supplies Sales and Rentals; Vehicle Parking					
Wholesale, Distribution, Storage Use Category					
Equipment and Materials Storage Yards; Moving and Storage Facilities; Warehouse; Wholesale Distribution					
Industrial					
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking and Transportation Terminals; Mining and Extractive Industries					
Research and Development				50	

	Compatible	**Indoor Uses**	Standard construction methods should attenuate exterior noise to an acceptable indoor noise level.
		Outdoor Uses	Activities associated with the land use may be carried out.
45, 50	**Conditionally Compatible**	**Indoor Uses**	Building structure must attenuate exterior noise to the indoor noise level indicated by the number for occupied areas.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable.
	Incompatible	**Indoor Uses**	New construction should not be undertaken.
		Outdoor Uses	Severe noise interference makes outdoor activities unacceptable.

SOURCE: City of San Diego 2015.

2.3 City of San Diego Municipal Code

2.3.1 On-site Generated Noise

Section 59.5.0401 of the City's Noise Abatement and Control Ordinance states that:

A. It shall be unlawful for any person to cause noise by any means to the extent that the one-hour average sound level exceeds the applicable limit.
B. The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts.

The applicable noise limits of the City's Noise Abatement and Control Ordinance are summarized in Table 2.

Table 2
Applicable Noise Level Limits

Land Use	Time of Day	One-Hour Average Sound Level [dB(A) L_{eq}]
Single-family Residential	7:00 a.m. to 7:00 p.m. 7:00 p.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	50 45 40
Multi-family Residential (up to a maximum density of 1 unit/2,000 square feet)	7:00 a.m. to 7:00 p.m. 7:00 p.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	55 50 45
All other Residential	7:00 a.m. to 7:00 p.m. 7:00 p.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	60 55 50
Commercial	7:00 a.m. to 7:00 p.m. 7:00 p.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	65 60 60
Industrial or Agricultural	Anytime	75

SOURCE: City of San Diego Noise Abatement and Control Ordinance Section 59.5.0401.
dB(A) L_{eq} = A-weighted decibels equivalent noise level

2.3.2 Construction Noise

Section 59.5.0404 of the City's Noise Abatement and Control Ordinance states that:

A. It shall be unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. . . .

B. . . . it shall be unlawful for any person, including the City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m.

Construction would be restricted to between the hours of 7:00 a.m. and 7:00 p.m. and construction noise levels may not exceed a 12-hour equivalent noise level [dB(A) $L_{eq(12)}$] of 75 dB(A) $L_{eq(12)}$ as assessed at or beyond the property line of a property zoned residential. As discussed, there are residential uses located north of the project site.

2.4 California Code of Regulations

Interior noise levels for habitable rooms are regulated also by Title 24 of the California Code of Regulations California Noise Insulation Standards. Title 24, Chapter 12, Section 1207.4, of the California Building Code requires that interior noise levels attributable to exterior sources not exceed 45 CNEL in any habitable room within a residential structure. A habitable room is a room used for living, sleeping, eating, or cooking. Bathrooms, closets, hallways, utility spaces, and similar areas are not considered habitable rooms for this regulation (24 California Code of Regulations 1207 2016).

3.0 Existing Conditions

Existing noise levels at the project site were measured on January 16, 2018, using one Larson-Davis LxT Sound Expert Sound Level Meters, serial number 3827. The following parameters were used:

Filter:	A-weighted
Response:	Slow
Time History Period:	5 seconds

The meter was calibrated before and after each measurement. The meter was set 5 feet above the ground level for each measurement.

Noise measurements were taken to obtain typical ambient noise levels at the project site and in the vicinity. The weather was warm and sunny. Three 15-minute measurements were taken, as described below. The primary sources of on-site noise were due to traffic on SR-905, Otay Mesa Road, and Ocean View Hills Parkway/Caliente Avenue. The measurement locations are shown on Figure 4, and detailed data is contained in Attachment 1.

Measurement 1 was located at the southern property fence line, approximately 150 feet north of SR-905 and 50 feet north of the SR-905 off-ramp. The main source of noise at this location was vehicle traffic on SR-905. During the 15-minute measurement period, vehicle traffic on westbound SR-905 was counted. The average measured noise level was 75.9 dB(A) L_{eq}.

Measurement 2 was located at the northern property line, approximately 40 feet south of Otay Mesa Road. The main source of noise at this location was vehicle traffic on Otay Mesa Road. Secondary sources of noise included vehicle traffic on SR-905 and aircraft. During the 15-minute measurement period, vehicle traffic on Otay Mesa Road was counted. The average measured noise level was 62.7 dB(A) L_{eq}.

Image source: NearMaps (flown June 2018)

FIGURE 4

Noise Measurement Locations

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Measurement 2 was located at the western property line, approximately 50 feet east of Caliente Avenue. The main source of noise at this location was vehicle traffic on Caliente Avenue. Secondary sources of noise included vehicle traffic on SR-905 and Otay Mesa Road. During the 15-minute measurement period, vehicle traffic on Caliente Avenue was counted. The average measured noise level was 61.5 dB(A) L_{eq}.

Noise measurements are summarized in Table 3, and vehicle traffic counts are summarized in Table 4.

Table 3
Noise Measurements

Measurement	Location	Time	Noise Sources	L_{eq}	L_{90}
1	Southern property line, 150 feet north of SR-905	2:27 P.M. – 2:42 P.M.	Vehicle traffic on SR-905	75.9	73.2
2	Northern property line, 40 feet south of Otay Mesa Road	2:55 P.M. – 3:10 P.M.	Vehicle traffic on Otay Mesa Road	62.7	52.3
3	Western property line, 50 feet east of Caliente Avenue	3:30 P.M. – 3:45 P.M.	Vehicle traffic on Caliente Avenue	61.5	56.7

Note: Noise measurement data is contained in Attachment 1.

Table 4
15-minute Traffic Counts

Measurement	Roadway	Direction	Autos	Medium Trucks	Heavy Trucks	Buses	Motorcycles
1	SR-905	Westbound	606	22	48	0	2
2	Otay Mesa Road	Westbound	177	6	1	1	1
		Eastbound	127	7	2	1	1
3	Caliente Avenue	Northbound	184	6	3	0	1
		Southbound	269	1	1	1	3

4.0 Analysis Methodology

Noise level predictions and contour mapping were developed using noise modeling software, SoundPlan Essential, version 3.0 (Navcon Engineering 2015). SoundPLAN calculates noise propagation based on the International Organization for Standardization method (ISO 9613-2 – Acoustics, Attenuation of Sound during Propagation Outdoors). The model calculates noise levels at selected receiver locations using input parameter estimates such as total noise generated by each noise source; distances between sources, barriers, and receivers; and shielding provided by intervening terrain, barriers, and structures. The model outputs can be developed as noise level contour maps or noise levels at specific receivers. In all cases, receivers were modeled at 5 feet above ground elevation, which represents the average height of the human ear.

4.1 Construction Noise Analysis

Project construction noise would be generated by diesel engine-driven construction equipment used for site preparation and grading, building construction, loading, unloading, and placing materials and paving. Diesel engine-driven trucks also would bring materials to the site and remove the soils from excavation.

Construction equipment with a diesel engine typically generates maximum noise levels from 80 to 90 dB(A) L_{eq} at a distance of 50 feet (FHWA 2006). Table 5 summarizes typical construction equipment noise levels.

Table 5
Typical Construction Equipment Noise Levels

Equipment	Noise Level at 50 Feet [dB(A) L_{eq}]	Typical Duty Cycle
Auger Drill Rig	85	20%
Backhoe	80	40%
Blasting	94	1%
Chain Saw	85	20%
Clam Shovel	93	20%
Compactor (ground)	80	20%
Compressor (air)	80	40%
Concrete Mixer Truck	85	40%
Concrete Pump	82	20%
Concrete Saw	90	20%
Crane (mobile or stationary)	85	20%
Dozer	85	40%
Dump Truck	84	40%
Excavator	85	40%
Front End Loader	80	40%
Generator (25 kilovolt ampts or less)	70	50%
Generator (more than 25 kilovolt amps)	82	50%
Grader	85	40%
Hydra Break Ram	90	10%
Impact Pile Driver (diesel or drop)	95	20%
Insitu Soil Sampling Rig	84	20%
Jackhammer	85	20%
Mounted Impact Hammer (hoe ram)	90	20%
Paver	85	50%
Pneumatic Tools	85	50%
Pumps	77	50%
Rock Drill	85	20%
Roller	74	40%
Scraper	85	40%
Tractor	84	40%
Vacuum Excavator (vac-truck)	85	40%
Vibratory Concrete Mixer	80	20%
Vibratory Pile Driver	95	20%
SOURCE: FHWA 2006.		

During excavation, grading, and paving operations, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as measurement. Although maximum noise levels may be 85 to 90 dB(A) at a distance of 50 feet during most construction activities, hourly average noise levels from the grading phase of construction would be 82 dB(A) L_{eq} at 50 feet from the center of construction activity when assessing the loudest pieces of equipment working simultaneously.

4.2 Traffic Noise Analysis

4.2.1 On-site Noise Compatibility

The SoundPLAN program uses the Federal Highway Administration (FHWA) Traffic Noise Model algorithms and reference levels to calculate traffic noise levels at selected receiver locations. The model uses various input parameters, such as projected hourly average traffic rates; vehicle mix, distribution, and speed; roadway lengths and gradients; distances between sources, barriers, and receivers; and shielding provided by intervening terrain, barriers, and structures. Receivers, roadways, and barriers were input into the model using three-dimensional coordinates. The locations of future buildings were obtained from project drawings.

The main source of traffic noise at the project site is vehicle traffic on SR-905, Otay Mesa Road, Caliente Avenue, and SR-905 on- and off-ramps. For the purpose of the future traffic noise compatibility analysis, the noisiest condition is represented as the maximum level of service (LOS) C traffic volume. This condition represents a condition where the maximum number of vehicles are using the roadway at the maximum speed. LOS A and B categories allow full travel speed but do not have as many vehicles, while LOS E and F have a greater number of vehicles, but due to the traffic volume travel at reduced speeds, thus generating less noise.

Freeway and roadway classifications and maximum Level of Service (LOS C) volumes were obtained from the Transportation Analysis prepared for the Otay Mesa CPU (Urban Systems Associates, Inc. 2012). Vehicle classification mixes were obtained from the California Department of Transportation (Caltrans) truck counts (Caltrans 2015). Maximum LOS C volumes for the freeway and ramps were presented as hourly volumes per lane. For Otay Mesa Road and Caliente Avenue, the peak hour volumes were calculated as 10 percent of the maximum LOS C daily volume. According to Caltrans peak hour counts for SR-905 adjacent to the project site (Caltrans 2016), this is conservative.

Table 6 summarizes the traffic parameters used in this compatibility analysis.

Table 6 Traffic Parameters									
Roadway	Classification	Maximum LOS C Volume[1]	Total Peak Hour Volume[2]	Speed (mph)	Vehicle Mix (percent)[3] Auto	MT	HT	Bus	MC
Otay Mesa Road	6-Lane Prime Arterial	55,000 ADT	5,500	55	87.7	4.1	6.2	1.0	1.0
Caliente Avenue	4-Lane Major Arterial	35,000 ADT	3,500	30	87.7	4.1	6.2	1.0	1.0
SR-905	6-Lane Freeway	1,880 vehicles per hour per lane	11,280	65/55[4]	87.7	4.1	6.2	1.0	1.0
SR-905 WB Off-Ramp	1-Lane Ramp	1,440 vehicles per hour per lane	1,440	30	87.7	4.1	6.2	1.0	1.0
SR-905 WB On-Ramp	1-Lane Ramp	1,440 vehicles per hour per lane	1,440	30	87.7	4.1	6.2	1.0	1.0
SR-905 EB Off-Ramp	1-Lane Ramp	1,440 vehicles per hour per lane	1,440	30	87.7	4.1	6.2	1.0	1.0
SR-905 EB On-Ramp	1-Lane Ramp	1,440 vehicles per hour per lane	1,440	30	87.7	4.1	6.2	1.0	1.0

LOS = level of service; ADT = average daily traffic; mph = miles per hour; SR-905 = State Route 905; WB = westbound; EB = eastbound

[1] Freeway Mainline Capacity = 2,350 vehicles per hour per lane
Freeway Auxiliary Lane Capacity = 1,800 vehicle per hour per lane
Maximum LOS Volume = 80% Capacity

[2] For Otay Mesa Road and Caliente Avenue: Total Peak Hour Volume = 10% Maximum LOS C ADT

[3] Auto = Automobile, MT = Medium Truck, HT = Heavy Truck, MC = Motorcycle

[4] Freeway speed limit is 65 mph for all vehicles except trucks, Truck speed limit is 55 mph

4.2.2 Off-site Vehicle Traffic Noise

Off-site traffic noise was modeled using the FHWA Traffic Noise Prediction Model algorithms and reference levels. Traffic noise levels were calculated at 50 feet from the centerline of the affected roadways to determine the noise level increase associated with the project. The model uses various input parameters, such as traffic volumes, vehicle mix, distribution, and speed.

The main source of local roadway traffic noise in the vicinity of the project site would be vehicle traffic on Ocean View Hills Boulevard, Caliente Avenue, and Otay Mesa Road. Traffic noise levels were calculated based on the total average daily traffic volume on each roadway segment. For modeling purposes, "hard" ground conditions were used for the analysis of future conditions, since a majority of the project area is paved and the hard site provides the most conservative impact assessment.

Existing, near-term, and horizon (year 2062) traffic volumes with and without the project were obtained from the project traffic report (LOS Engineering, Inc. 2018). Table 7 summarizes the traffic volumes for the analyzed segments of Ocean View Hills Boulevard, Caliente Avenue, and Otay Mesa Road. Modeled noise levels do not account for shielding provided by intervening barriers and structures.

Table 7 Traffic Volumes						
Roadway Segment	Existin g	Existing + Project	Near-Term	Near-Term + Project	Horizon	Horizon + Project
Ocean View Hills Parkway						
Starfish Way to Sea Drift Way	12,963	13,765	15,647	17,352	19,900	20,702
Sea Drift Way to Del Sol Boulevard	10,919	11,768	13,878	15,641	17,800	18,649
Del Sol Boulevard to Sea Fire Point	10,048	11,651	12,380	14,673	17,800	19,403
Sea Fire Point to Hidden Trails Road	9,591	11,383	13,496	16,224	17,000	18,792
Hidden Trails Road to Otay Mesa Road	11,405	13,433	15,774	18,749	18,300	20,328
Caliente Avenue						
Otay Mesa Road to SR-905 Westbound Ramps	20,951	22,130	27,366	28,545	38,000	39,179
SR-905 Westbound Ramps to SR-905 Eastbound Ramps	14,288	14,995	21,646	22,353	33,200	33,907
SR-905 Eastbound Ramps to Airway Road	7,947	8,183	16,163	16,399	32,000	32,236
Otay Mesa Road						
Ocean View Hills Parkway to Driveway	16,330	21,306	25,607	30,583	39,700	44,676
Driveway to Emerald Crest Court	16,330	20,624	25,607	29,901	39,700	43,904
Emerald Crest Court to Corporate Center Drive	15,855	17,034	23,059	24,238	36,900	38,079
Corporate Center Drive to Innovative Drive	10,499	11,442	15,632	16,575	20,200	21,143
Innovative Drive to Heritage Road	11,864	12,807	16,979	17,922	22,800	23,743

4.3 On-site Generated Noise Analysis

The noise sources on the project site after completion of construction are anticipated to be those that would be typical of any residential complex, such as vehicles arriving and leaving, children at play, and landscape maintenance machinery. None of these noise sources is anticipated to violate the City's Noise Abatement and Control Ordinance or result in a substantial permanent increase in existing noise levels. However, the project would rooftop heating, ventilation, and air conditioning (HVAC) units that have the potential to produce noise in excess of City limits (see Table 2).

It is not known at this time which manufacturer, brand, or model of unit or units would be selected for use in the project. For the purposes of this analysis, to determine what general noise levels the HVAC units would generate, it was assumed that the rooftop units would be similar to a Trane split system unit with a sound power level of 72 dB(A). The unit specification sheets are included in Attachment 2.

5.0 Future Acoustical Environment and Impacts

5.1 Construction Noise

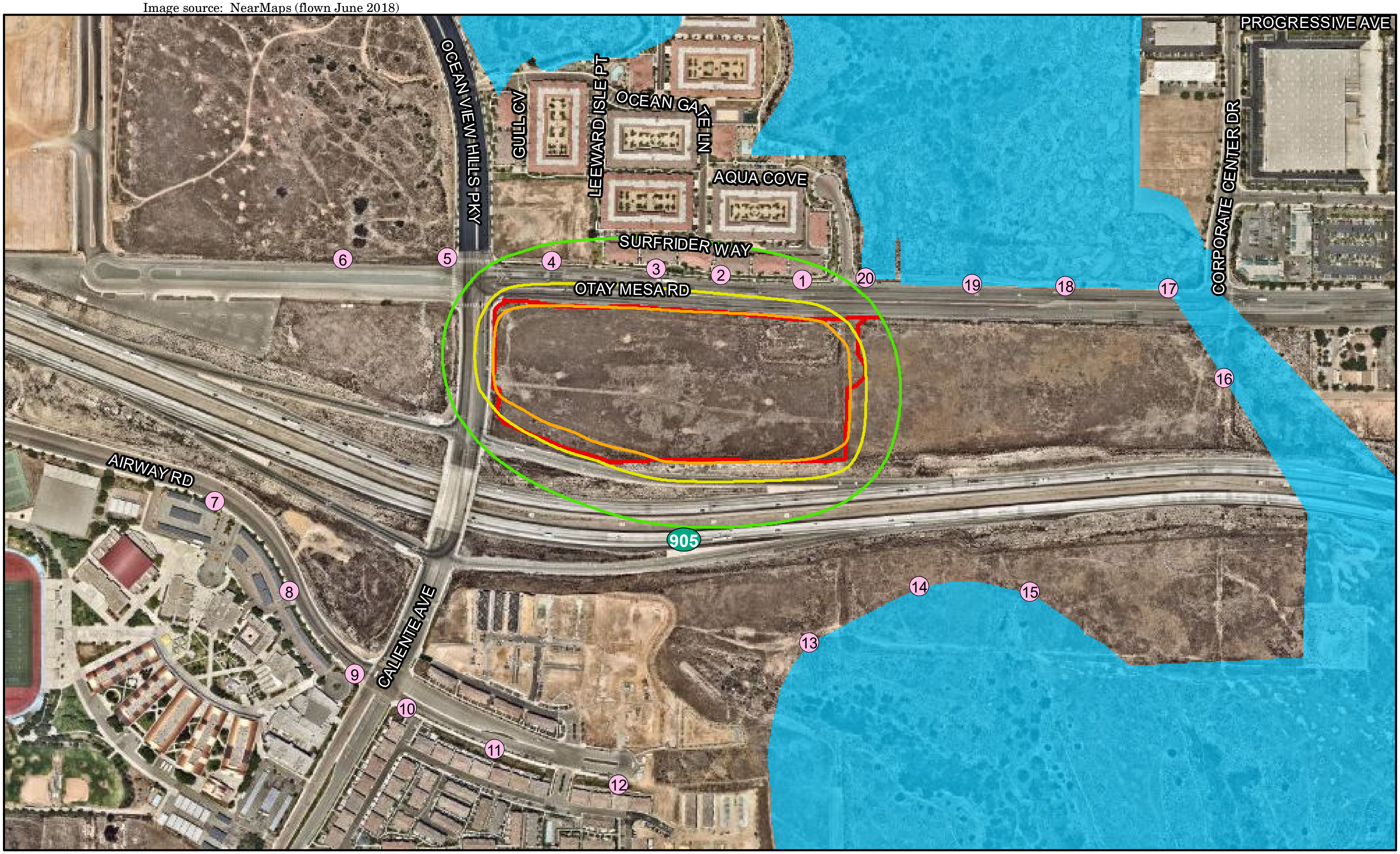
5.1.1 Off-site Receivers

Noise associated with the grading, building, and paving for the project would potentially result in short-term impacts to surrounding properties. The project site is surrounded by multi-family uses to the north, SR-905 and open space to the south, and San Ysidro High School to the southwest. Additionally, Multi-Habitat Planning Area (MHPA) habitat is located northeast of the project site. A variety of noise-generating equipment would be used during the construction phase of the project, such as excavators, backhoes, front-end loaders, and concrete saws, along with others. The exact number and pieces of construction equipment required are not known at this time. Although maximum noise levels may be 85 to 90 dB(A) at a distance of 50 feet during most construction activities, hourly average noise levels would be lower when taking into account the equipment usage factors. The loudest phase of construction would be the grading/excavation phase and would include dozers, loaders, and excavators. Construction noise levels were calculated based on all three pieces of equipment being active simultaneously.

Construction noise is considered a point source and would attenuate at approximately 6 dB(A) for every doubling of distance. Average hourly noise levels due to simultaneous activity would be 82 dB(A) L_{eq} at 50 feet. To reflect the nature of grading and construction activities, equipment was modeled as an area source distributed over the project footprint. The total sound energy of the area source was modeled with all pieces of equipment operating simultaneously. Noise levels were modeled at a series of 20 receivers located at the adjacent uses and MHPA. The results are summarized in Table 8. Modeled receiver locations and construction noise contours are shown in Figure 5. SoundPLAN data is contained in Attachment 3.

As shown, construction noise levels are not anticipated to exceed 75 dB(A) L_{eq} at the adjacent residential uses or 60 dB(A) L_{eq} at the adjacent MHPA habitat. Although the existing adjacent residences and MHPA would be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary. Additionally, construction activities are not anticipated to exceed 75 dB(A)L_{eq}. As construction activities associated with the project would comply with noise level limits from Noise Abatement and Control Ordinance Section 59.5.0404, temporary increases in noise levels from construction activities would be less than significant.

Image source: NearMaps (flown June 2018)



Project Boundary

City of San Diego MHPA

Receiver

Construction Noise Contours

60 dB(A) Leq

65 dB(A) Leq

70 dB(A) Leq

0 Feet 500

FIGURE 5

Construction Noise Contours

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Table 8
Construction Noise Levels at Off-site Receivers

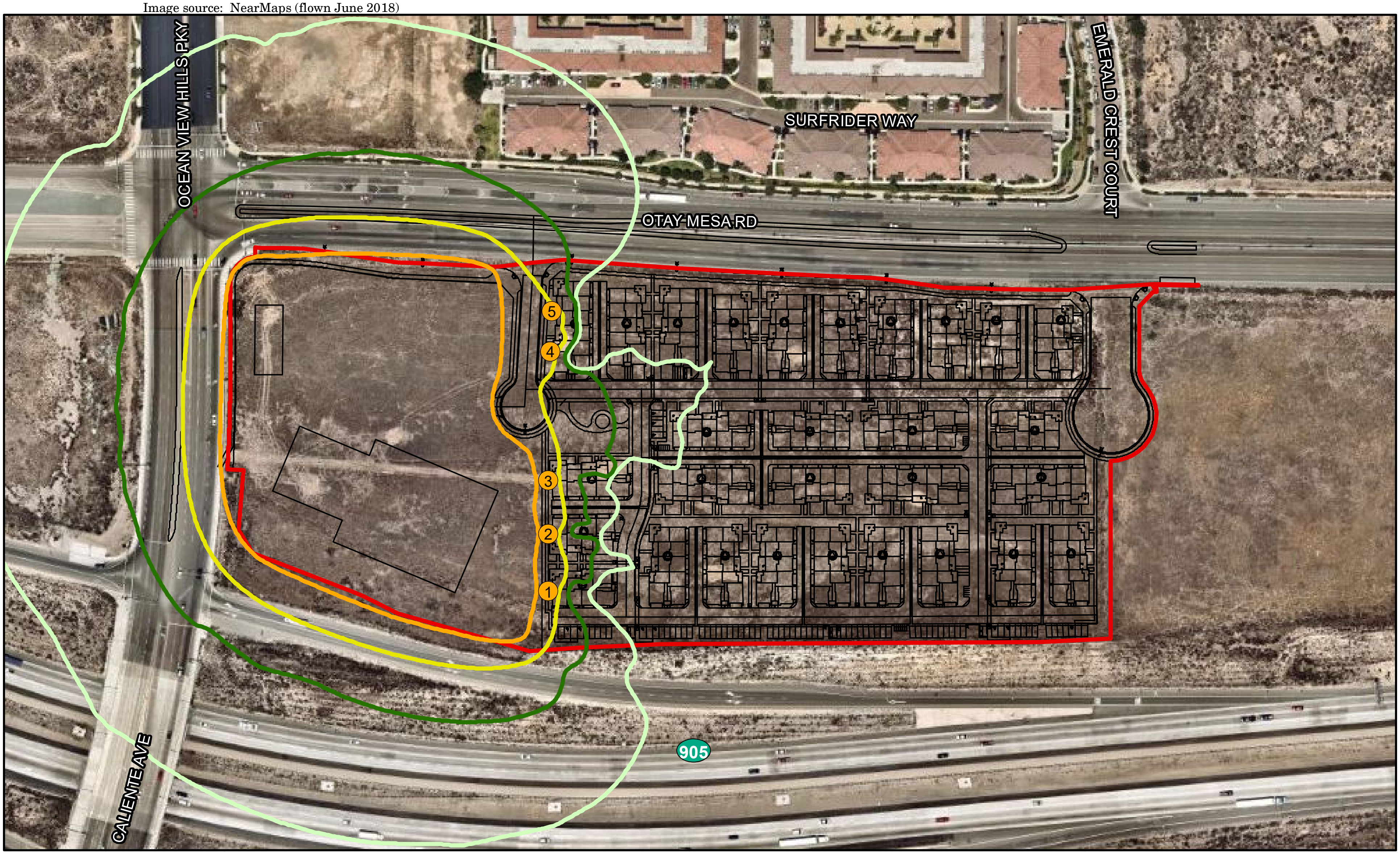
Receiver	Land Use	Construction Noise Level [dB(A) L_{eq}]
1	Residential	62
2	Residential	62
3	Residential	62
4	Future Residential	53
5	Vacant	62
6	School	57
7	School	49
8	School	50
9	Residential	50
10	Residential	50
11	Residential	51
12	MHPA	51
13	MHPA	54
14	MHPA	54
15	MHPA	51
16	MHPA	48
17	MHPA	49
18	MHPA	52
19	MHPA	54
20	MHPA	59

dB(A) L_{eq} = A-weighted decibels equivalent noise level
MHPA = multi-habitat planning area

5.1.2 On-site Receivers

If construction of the residential portion of the project is completed prior to construction of the commercial lot, future on-site residential receivers would be exposed to noise associated with construction of the commercial lot. Grading of the entire project would be completed in one stage; therefore, noise associated with construction activities at the commercial lot would likely be less than those associated with mass grading. However, as a worst-case scenario, the same average hourly noise level used to model noise levels at off-site receivers was also used to calculate construction noise levels at the on-site residential uses closest to the commercial lot. The results are summarized in Table 9. Modeled receiver locations and construction noise contours are shown in Figure 6. SoundPLAN data is contained in Attachment 4. As shown, construction noise levels are not anticipated to exceed 75 dB(A) L_{eq} at the on-site residential uses.

Image source: NearMaps (flown June 2018)



Project Boundary
Plan Lines
On-Site Residential Receivers

Construction Noise Contours
60 dB(A) Leq
65 dB(A) Leq
70 dB(A) Leq
75 dB(A) Leq

0 Feet 200

FIGURE 6

Commercial Lot Construction Noise Contours

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Table 9 Construction Noise Levels at On-site Receivers		
Receiver	Land Use	Construction Noise Level [dB(A) L_{eq}]
1	On-Site Residential	74
2	On-Site Residential	74
3	On-Site Residential	74
4	On-Site Residential	71
5	On-Site Residential	70
dB(A) L_{eq} = A-weighted decibels equivalent noise level		

5.2 Vehicle Traffic Noise

5.2.1 On-site Noise Compatibility

The project site is located within the Otay Mesa CPU area. As discussed, noise impacts were addressed in the FPEIR which was approved in 2013. For the proposed project, as required by mitigation measure NOI-1, this site-specific noise analysis calculates exterior noise levels and analyzes noise reduction measures, as necessary, to demonstrate that future noise would not exceed the residential noise compatibility standards of the General Plan. Multi-family residential uses are "compatible" with exterior noise levels up to 60 CNEL, and "conditionally compatible" with exterior noise levels up to 70 CNEL. In "conditionally compatible" areas, feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable, and building structures must attenuate exterior noise levels to an indoor noise level of 45 CNEL. The exterior compatibility standard is applicable at the proposed exterior use areas. In the case of the proposed project, exterior use areas include the balconies.

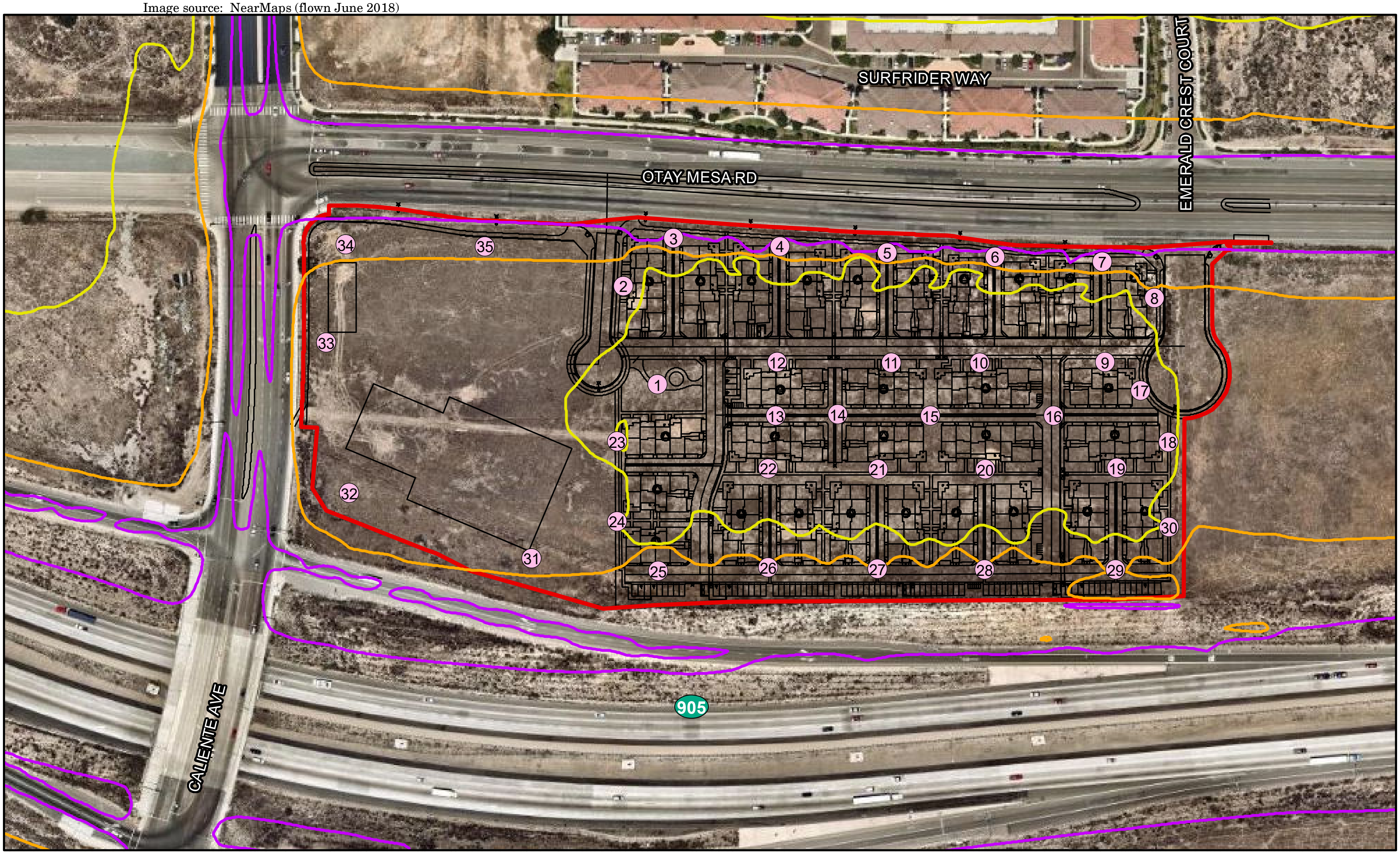
Additionally, for the non-residential components of the project, the exterior noise level limit for park uses is 65 CNEL, and the exterior noise level limit for commercial and retail uses is 75 CNEL with an interior noise level standard of 50 CNEL (City of San Diego 2016).

Exterior Noise

Vehicle traffic noise level contours across the project site were calculated using SoundPLAN. These contours take into account shielding provided by proposed buildings, topography, and proposed grading. These noise contours are shown in Figure 7. As shown, first-floor noise levels would exceed 65 CNEL across the entire project site, and would exceed 70 CNEL at the uses located within approximately 80 feet from the edge of Otay Mesa Road and within approximately 170 feet from the edge of SR-905.

To determine exterior noise levels at the commercial area, park, and building façades, noise levels were modeled at 35 specific receiver locations, as shown in Figure 7. Exterior noise levels were modeled at first- through third-floor elevations. The results are summarized in Table 10. SoundPLAN data are provided in Attachment 5.

Image source: NearMaps (flown June 2018)



Project Boundary

Plan Lines

On-site Receiver

Vehicle Traffic Noise Contours

65 CNEL

70 CNEL

75 CNEL

FIGURE 7

Vehicle Traffic Noise Contours

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Table 10 Future Vehicle Traffic Noise Levels				
		Exterior Noise Level (CNEL)		
Receiver	Location	First Floor	Second Floor	Third Floor
1	Park	62	--	--
2	Residential Building Façade	68	70	71
3	Residential Building Façade	74	75	75
4	Residential Building Façade	73	75	75
5	Residential Building Façade	73	74	75
6	Residential Building Façade	73	75	75
7	Residential Building Façade	72	74	75
8	Residential Building Façade	69	71	72
9	Residential Building Façade	62	65	66
10	Residential Building Façade	57	59	61
11	Residential Building Façade	58	60	61
12	Residential Building Façade	59	61	62
13	Residential Building Façade	51	53	55
14	Residential Building Façade	57	59	60
15	Residential Building Façade	57	59	60
16	Residential Building Façade	58	61	63
17	Residential Building Façade	64	68	69
18	Residential Building Façade	64	69	70
19	Residential Building Façade	61	64	67
20	Residential Building Façade	60	63	64
21	Residential Building Façade	61	63	64
22	Residential Building Façade	61	63	64
23	Residential Building Façade	65	68	69
24	Residential Building Façade	66	69	70
25	Residential Building Façade	72	74	75
26	Residential Building Façade	70	72	73
27	Residential Building Façade	70	73	73
28	Residential Building Façade	71	73	74
29	Residential Building Façade	70	74	74
30	Residential Building Façade	67	72	72
31	Commercial Lot	69	72	72
32	Commercial Lot	68	71	72
33	Commercial Lot	68	70	71
34	Commercial Lot	71	73	74
35	Commercial Lot	71	73	74

As shown, noise levels at the proposed park would be 62 CNEL, which would be compatible with the City's standard of 65 CNEL. Noise levels at the perimeter of the commercial lot would range from 68 to 74 CNEL, which would be compatible with the City's commercial standard of 75 CNEL.

To refine the analysis further, exterior noise levels were modeled at each proposed second-floor balcony location. Note that there are no balconies proposed at the third floor level. Balcony receiver locations are shown in Figure 8. As shown, balcony noise levels are projected to exceed the "conditionally compatible" noise level of 70 CNEL at 27 of the balconies facing Otay Mesa Road and SR-905. Therefore, the project includes noise attenuating design measures in the form of a solid 3.5-foot balcony wall extending the length/perimeter of the balcony on the 27 balconies. In order to reduce noise levels at these receivers, the 3.5-foot balcony railing would need to be constructed as a solid barrier. Noise levels at these balconies were modeled with construction of this 3.5-foot balcony, and the results are summarized in Table 11. SoundPLAN data is provided in Attachment 6.

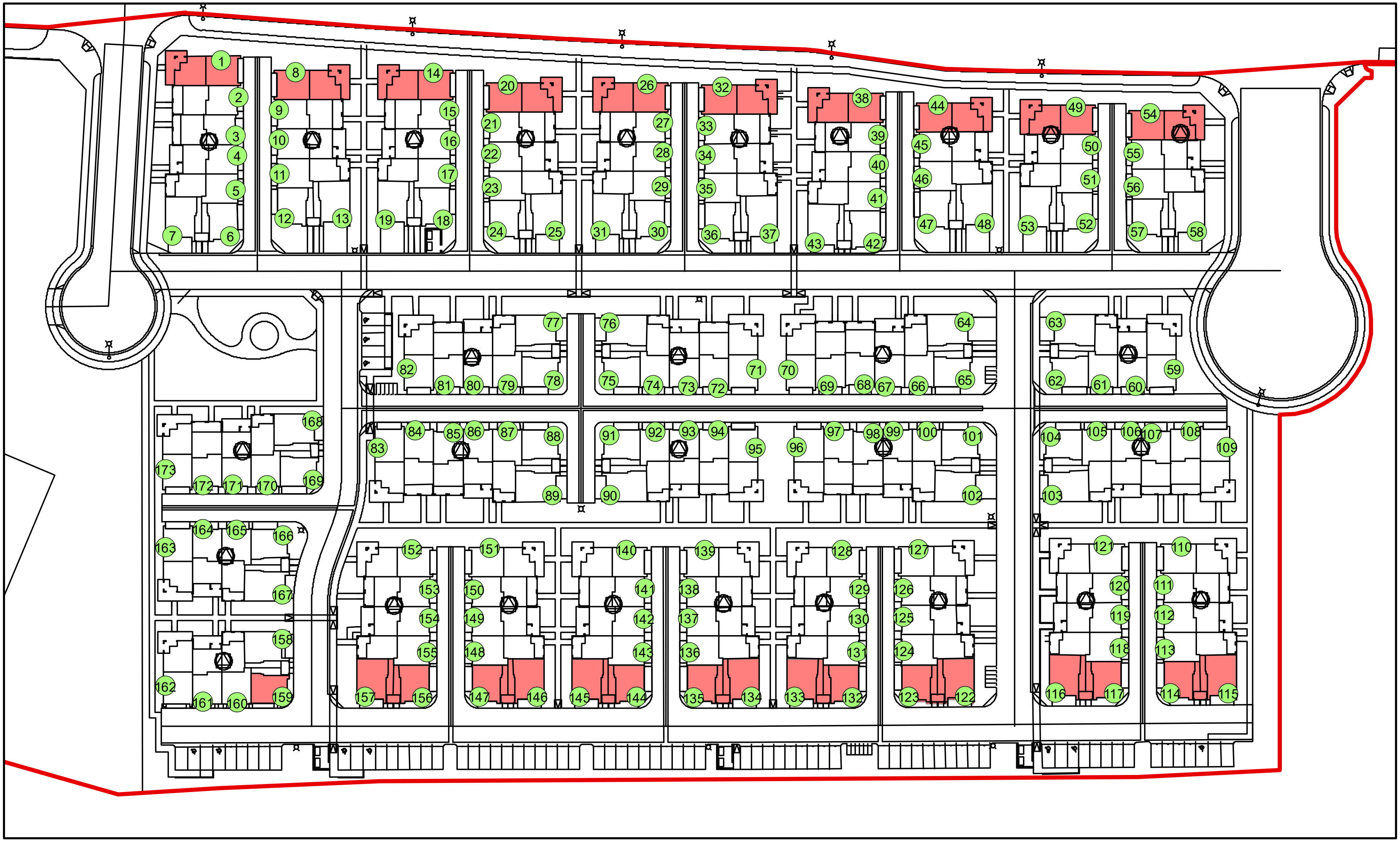
Table 11
Mitigated Future Vehicle Traffic Noise Levels

Receiver	Balcony Noise Level (CNEL)	
	Without Balcony Barriers	With Balcony Barriers
1	74	68
8	74	68
14	74	68
20	74	68
26	74	69
32	74	68
38	74	68
44	73	68
49	74	68
54	73	67
114	74	70
115	75	70
116	74	69
117	75	70
122	74	69
123	74	69
132	74	69
133	73	69
134	74	69
135	73	69
144	74	69
145	73	69
146	73	69
147	73	68
156	73	69
157	73	68
159	72	68

As shown, with construction of a solid 3.5-foot balcony wall, balcony noise levels would be reduced to 70 CNEL or less.

Interior Noise

Interior noise levels can be reduced through standard construction techniques. When windows are closed, standard construction techniques provide various exterior-to-interior noise level reductions depending on the type of structure and window. According to the FHWA's *Highway Traffic Noise Analysis and Abatement Guidance,* buildings with masonry façades and double glazed windows can be estimated to provide a noise level reduction of 35 dB, while light-frame structures with double glazed windows may provide noise level reductions of 20 to 25 dB (FHWA 2011).



0 Feet 100

Project Boundary
2nd Floor Balcony Receivers
Plan Lines
Balconies Exceeding 70 CNEL

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FIGURE 8

Second-Floor Balcony Noise Levels

The interior noise level standard for commercial uses is 50 CNEL. As discussed, exterior noise levels at the perimeter of commercial lot would range from 68 to 74 CNEL. No site or building design is available for the commercial lot at this time. However, assuming light-frame construction, interior noise levels would be reduced to 49 CNEL. Thus, interior noise levels in the commercial buildings would be compatible with City standards.

The interior noise level standard for residential uses is 45 CNEL. As shown in Table 10, exterior noise levels at the residential building façades would be as high as 75 CNEL. A noise reduction of up to 30 dB would be required to achieve an interior noise level of 45 CNEL or less. As required by NOI-2 of the Otay Mesa CPU FPEIR (see Section 2.1), prior to the issuance of building permits, a site-specific interior noise analysis would be prepared demonstrating that the window, door, and wall components would achieve a necessary sound transmission class rating required to reduce interior noise levels to 45 CNEL or less. The units that would require the interior noise analysis are indicated in Figure 9.

5.2.2 Off-site Vehicle Traffic Noise

The project would increase traffic volumes on local roadways. However, the project would not substantially alter the vehicle classifications mix on local or regional roadways nor would the project alter the speed on an existing roadway or create a new roadway. Thus, the primary factor affecting off-site noise levels would be increased traffic volumes. While changes in noise levels would occur along any roadway where project-related traffic occurs, for noise assessment purposes, noise level increases are assumed to be greatest nearest the project site, as this location would represent the greatest concentration of project-related traffic. A substantial noise increase is defined as an increase of 3 dB above existing conditions as stated in the City's CEQA significance standards.

Table 12 presents a conservative assessment of traffic noise levels based on the existing, existing plus project, near-term (existing plus cumulative), near-term plus project, horizon (year 2062), and horizon plus project noise levels generated by traffic. Table 12 also summarizes the traffic noise level increases due to the project. Noise level calculations are contained in Attachment 7.

As shown in Table 12, direct off-site noise level increases due to the project would be less than 1 dB. Therefore, direct off-site noise impacts associated with the project would be less than significant.

Similar to direct traffic noise impacts, a cumulative traffic noise impact occurs when the noise level would exceed the applicable standard and a substantial noise level increase compared to existing noise occurs. As shown, the total horizon (year 2062) with project increase over the existing condition would range from less than 1 dB to 6 dB. However, the project's contribution to the increase over ambient noise levels would be less than 1 dB. Therefore, the project would result in a less than cumulatively considerable off-site noise level increase, and cumulative traffic noise impacts associated with the project would be less than significant.

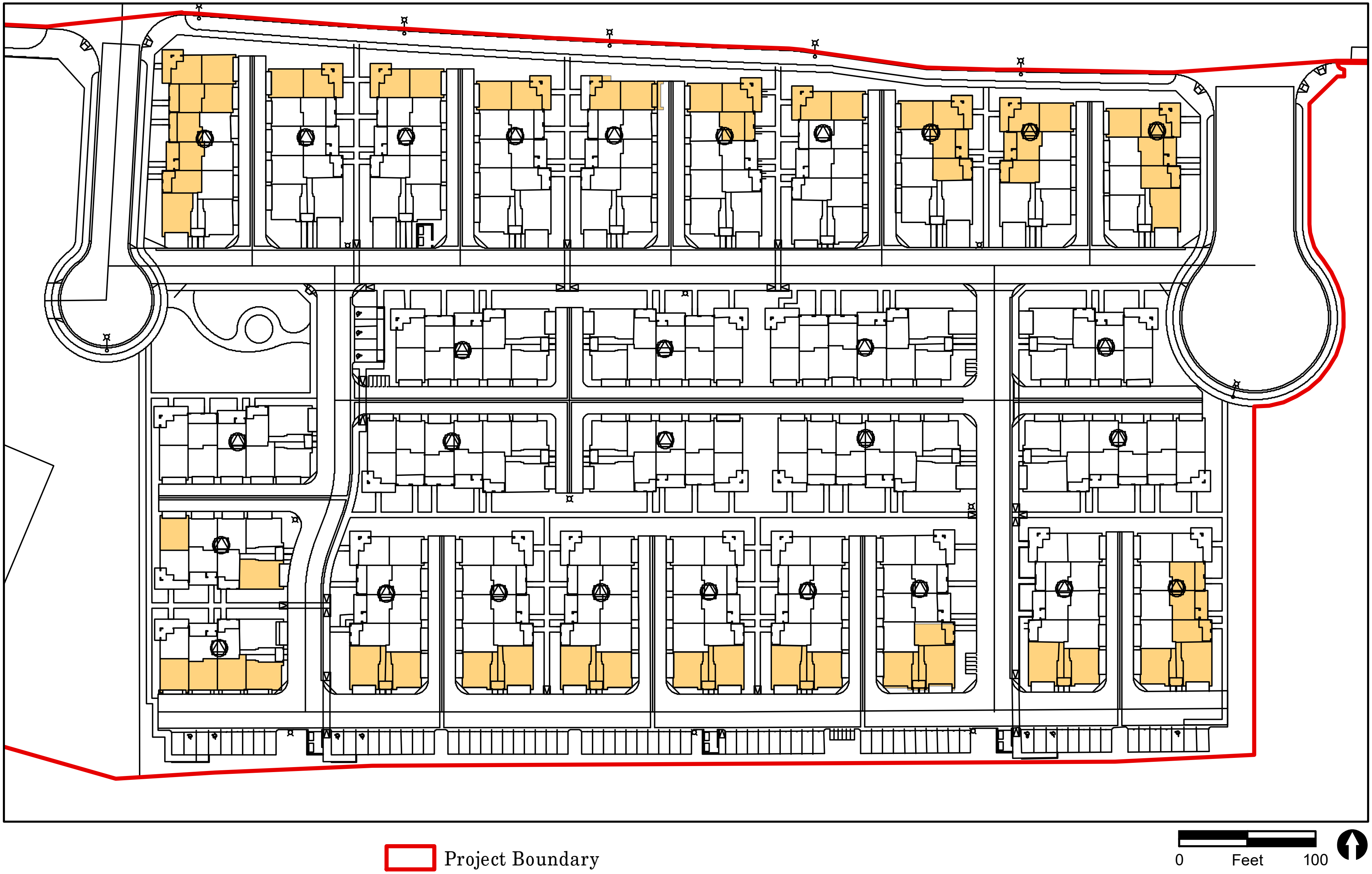

FIGURE 9

Units Requiring Site Specific Interior Noise Analysis

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Table 12 Traffic Noise Levels with and without Project and Ambient Noise Increase (CNEL)										
Roadway Segment	Existing			Near-Term (Existing + Cumulative)			Horizon (Year 2062)			Total Increase Over Existing
	Without Project	With Project	Increase	Without Project	With Project	Increase	Without Project	With Project	Increase	
Ocean View Hills Parkway										
Starfish Way to Sea Drift Way	71	72	1	72	72	<1	73	73	<1	2
Sea Drift Way to Del Sol Boulevard	71	71	<1	72	72	<1	73	73	<1	2
Del Sol Boulevard to Sea Fire Point	70	71	1	71	72	1	73	73	<1	3
Sea Fire Point to Hidden Trails Road	70	71	1	72	72	<1	73	73	<1	3
Hidden Trails Road to Otay Mesa Road	72	72	<1	73	74	1	74	74	<1	2
Caliente Avenue										
Otay Mesa Road to SR-905 Westbound Ramps	73	73	<1	74	74	<1	75	75	<1	2
SR-905 Westbound Ramps to SR-905 Eastbound Ramps	72	72	<1	74	74	<1	75	76	1	4
SR-905 Eastbound Ramps to Airway Road	69	69	<1	72	72	<1	75	75	<1	6
Otay Mesa Road										
Ocean View Hills Parkway to Driveway	75	76	1	77	78	1	79	79	<1	4
Driveway to Emerald Crest Court	75	76	1	77	77	<1	79	79	<1	4
Emerald Crest Court to Corporate Center Drive	74	74	<1	76	76	<1	78	78	<1	4
Corporate Center Drive to Innovative Drive	71	72	1	73	73	<1	74	74	<1	3
Innovative Drive to Heritage Road	72	72	<1	73	74	<1	75	75	<1	3

5.3 On-site Generated Noise

The primary noise sources on-site would be rooftop HVAC equipment. Using the on-site noise source parameters discussed in Section 4.3, noise levels were modeled at a series of 20 receivers located at the property line. HVAC unit locations were obtained from the roof plan drawings. Noise generated by HVAC equipment would occur on an intermittent basis, primarily during the day and evening hours and less frequently during the nighttime hours. For a worst-case analysis, it was assumed that the HVAC units would operate continuously.

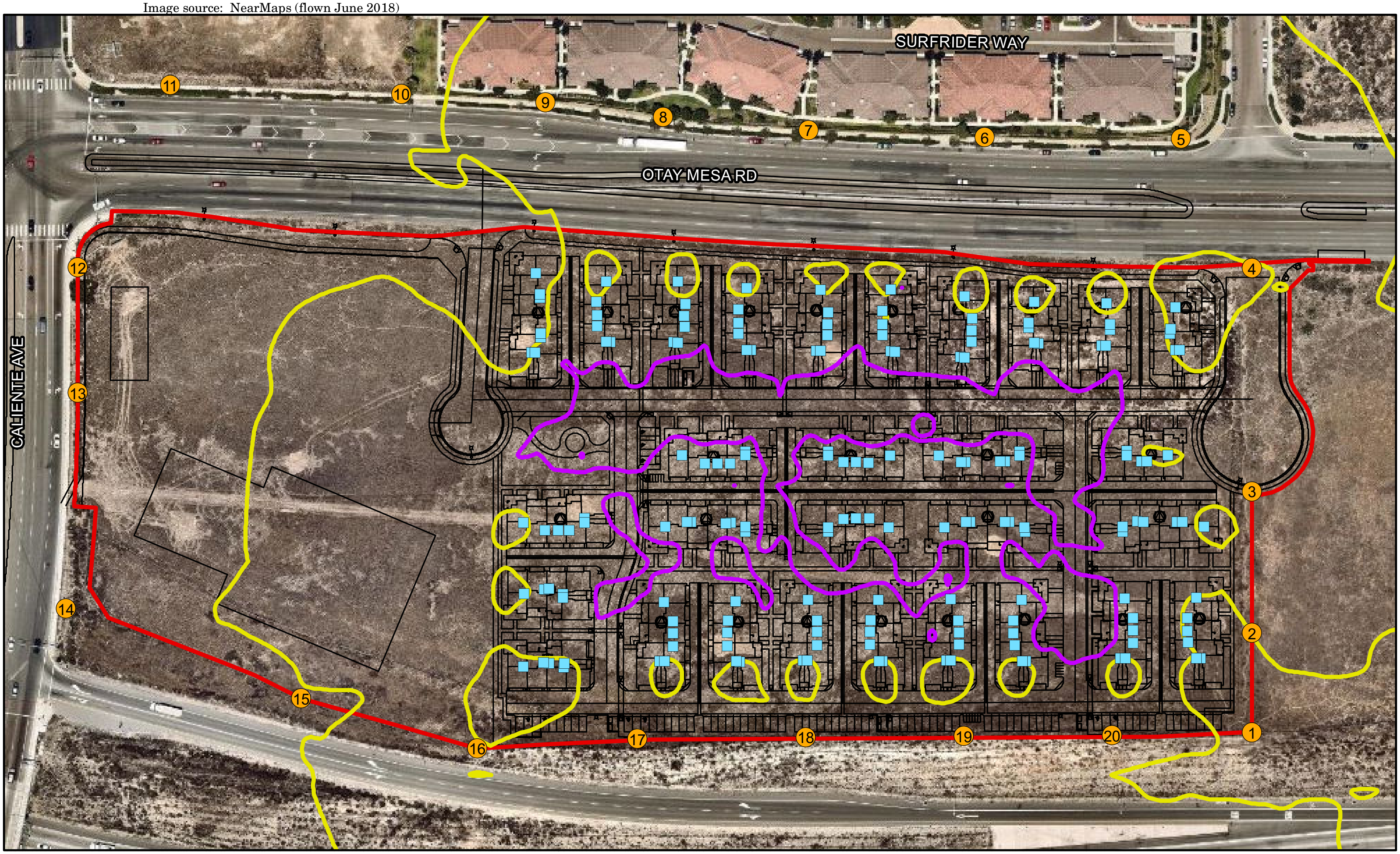
Modeled receivers and the locations of the HVAC units are shown in Figure 10. Modeled data is included in Attachment 8. Future projected noise levels are summarized in Table 13.

Table 13
HVAC Noise Levels at Adjacent Property Lines

Receiver	Noise Level [dB(A) L_{eq}]
1	35
2	36
3	37
4	35
5	37
6	38
7	38
8	37
9	36
10	35
11	33
12	33
13	33
14	34
15	35
16	35
17	38
18	38
19	38
20	37

As shown, on-site generated noise levels would range from 33 to 38 dB(A) L_{eq} at the property lines which would be less than the most restrictive multi-family noise level limit of 45 dB(A) L_{eq}. Noise levels would not exceed the applicable Noise Abatement and Control Ordinance limits at the property lines.

Image source: NearMaps (flown June 2018)



Project Boundary
Plan Lines
Property Line Receivers
HVAC Units
HVAC Noise Contours
35 dB(A) Leq
40 dB(A) Leq

0 Feet 150

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FIGURE 10

On-Site Generated Noise Contours

6.0 Conclusions

6.1 Construction Noise

As shown in Tables 8 and 9, construction noise levels are not anticipated to exceed 75 dB(A) L_{eq} at the adjacent or on-site residential uses, or 60 dB(A) L_{eq} at the adjacent MHPA habitat. Although the existing adjacent residences and MHPA would be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary. Additionally, construction activities are not anticipated to exceed 75 dB(A)L_{eq}. As construction activities associated with the project would comply with noise level limits from Noise Abatement and Control Ordinance Section 59.5.0404, temporary increases in noise levels from construction activities would be less than significant.

6.2 Vehicle Traffic Noise

6.2.1 On-site Noise Compatibility

The main source of noise at the project site is vehicle traffic on SR-905, Otay Mesa Road, Caliente Avenue, and SR-905 on- and off-ramps. Multi-family residential uses are "compatible" with exterior noise levels up to 60 CNEL, and "conditionally compatible" with exterior noise levels up to 70 CNEL. In "conditionally compatible" areas, feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable, and building structures must attenuate exterior noise levels to an indoor noise level of 45 CNEL. The exterior compatibility standard is applicable at the proposed exterior use areas. In the case of the proposed project, exterior use areas include the balconies. Additionally, for the non-residential components of the project, the exterior noise level limit for park uses is 65 CNEL, and the exterior noise level limit for commercial and retail uses is 75 CNEL with an interior noise level standard of 50 CNEL (City of San Diego 2016).

As shown in Table 10, noise levels at the proposed park would be 62 CNEL, which would be compatible with the City's standard of 65 CNEL, and noise levels at the perimeter of the commercial lot would range from 68 to 74 CNEL, which would be compatible with the City's commercial standard of 75 CNEL.

Exterior noise levels were modeled at each proposed balcony location. Balcony noise levels are projected to exceed the "conditionally compatible" noise level of 70 CNEL at 27 of the balconies facing Otay Mesa Road and SR-905. Therefore, the project includes noise attenuating design measures in the form of a solid 3.5-foot balcony wall extending the length/perimeter of the balcony on the 27 balconies. With construction of a solid 3.5-foot balcony wall, balcony noise levels would be reduced to 70 CNEL or less at all balconies.

The interior noise level standard for commercial uses is 50 CNEL. No site or building design is available for the commercial lot at this time. However, assuming light-frame construction, interior noise levels would be reduced to 49 CNEL. Thus, interior noise levels in the commercial buildings would be compatible with City standards.

The interior noise level standard for residential uses is 45 CNEL. A noise reduction of up to 30 dB would be required to achieve an interior noise level of 45 CNEL or less. As required by NOI-2 of the Otay Mesa CPU FPEIR (see Section 2.1), prior to the issuance of building permits, a site-specific interior noise analysis would be prepared demonstrating that the window, door, and wall components would achieve a necessary sound transmission class rating required to reduce interior noise levels to 45 CNEL or less. Thus, interior noise impacts would be less than significant.

6.2.2 Off-site Vehicle Traffic Noise

The project would increase traffic volumes on local roadways. However, the project would not substantially alter the vehicle classifications mix on local or regional roadways, nor would the project alter the speed on an existing roadway or create a new roadway. Thus, the primary factor affecting off-site noise levels would be increased traffic volumes. A substantial noise increase is defined as an increase of 3 dB above existing conditions as stated in the City's CEQA significance standards.

As shown in Table 12, direct off-site noise level increases due to the project would be less than 1 dB. Therefore, direct off-site noise impacts associated with the project would be less than significant. The total horizon (year 2062) with project increase over the existing condition would range from less than 1 dB to 6 dB. However, the project's contribution to the increase over ambient noise levels would be less than 1 dB. Therefore, the project would result in a less than cumulatively considerable off-site noise level increase, and cumulative traffic noise impacts associated with the project would be less than significant.

6.3 On-site Generated Noise

The noise sources on the project site after completion of construction are anticipated to be those that would be typical of any residential complex, such as vehicles arriving and leaving and landscape maintenance machinery. None of these noise sources is anticipated to violate the City's Noise Abatement and Control Ordinance. Rooftop HVAC noise levels were modeled at the adjacent property lines. As shown in Table 13, on-site generated noise levels would range from 33 to 38 dB(A) L_{eq}. Noise levels would not exceed the applicable limits at the property lines.

7.0 References Cited

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ATTACHMENTS

ATTACHMENT 1

Noise Measurement Data

Summary						
Filename	LxT_Data.019					
Serial Number	3827					
Model	SoundExpert™ LxT					
Firmware Version	2.301					
User						
Location						
Job Description						
Note						
Measurement Description						
Start	2018/01/16 14:27:24					
Stop	2018/01/16 14:42:30					
Duration	0:15:06.4					
Run Time	0:15:06.4					
Pause	0:00:00.0					
Pre Calibration	2018/01/16 14:21:13					
Post Calibration	None					
Calibration Deviation	---					
Overall Settings						
RMS Weight	A Weighting					
Peak Weight	A Weighting					
Detector	Slow					
Preamp	PRMLxT1L					
Microphone Correction	Off					
Integration Method	Linear					
OBA Range	Normal					
OBA Bandwidth	1/1 and 1/3					
OBA Freq. Weighting	A Weighting					
OBA Max Spectrum	At Lmax					
Overload	121.7 dB					
	A	**C**	**Z**			
Under Range Peak	**78.0**	75.0	80.0 dB			
Under Range Limit	**26.0**	25.2	32.0 dB			
Noise Floor	16.2	16.1	21.9 dB			
Results						
LAeq	75.9 dB					
LAE	105.5 dB					
EA	3.946 mPa²h					
LApeak (max)	2018/01/16 14:39:09	95.6 dB				
LASmax	2018/01/16 14:33:05	81.4 dB				
LASmin	2018/01/16 14:28:38	67.1 dB				
SEA	-99.9 dB					
LAS > 85.0 dB (Exceedence Counts / Duration)	0	0.0 s				
LAS > 115.0 dB (Exceedence Counts / Duration)	0	0.0 s				
LApeak > 135.0 dB (Exceedence Counts / Duration)	0	0.0 s				
LApeak > 137.0 dB (Exceedence Counts / Duration)	0	0.0 s				
LApeak > 140.0 dB (Exceedence Counts / Duration)	0	0.0 s				
Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**
	75.9	75.9	-99.9	75.9	75.9	-99.9
LCeq	79.9 dB					
LAeq	75.9 dB					
LCeq - LAeq	4.0 dB					
LAIeq	76.6 dB					
LAeq	75.9 dB					
LAIeq - LAeq	0.7 dB					
# Overloads	0					
Overload Duration	0.0 s					
# OBA Overloads	0					
OBA Overload Duration	0.0 s					
Statistics						
LAS5.00	78.3 dB					
LAS10.00	77.6 dB					
LAS33.30	76.4 dB					
LAS50.00	75.7 dB					
LAS66.60	75.0 dB					
LAS90.00	73.2 dB					

Summary			
Filename	LxT_Data.020		
Serial Number	3827		
Model	SoundExpert™ LxT		
Firmware Version	2.301		
User			
Location			
Job Description			
Note			
Measurement Description			
Start	2018/01/16 14:54:52		
Stop	2018/01/16 15:10:21		
Duration	0:15:28.8		
Run Time	0:15:28.8		
Pause	0:00:00.0		
Pre Calibration	2018/01/16 14:51:09		
Post Calibration	None		
Calibration Deviation	---		
Overall Settings			
RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRMLxT1L		
Microphone Correction	Off		
Integration Method	Linear		
OBA Range	Normal		
OBA Bandwidth	1/1 and 1/3		
OBA Freq. Weighting	A Weighting		
OBA Max Spectrum	At Lmax		
Overload	121.8 dB		
	A	**C**	**Z**
Under Range Peak	**78.1**	75.1	80.1 dB
Under Range Limit	**26.1**	25.2	32.1 dB
Noise Floor	16.3	16.1	22.0 dB
Results			
LAeq	62.7 dB		
LAE	92.3 dB		
EA	190.023 µPa²h		
LApeak (max)	2018/01/16 15:10:09	96.1 dB	
LASmax	2018/01/16 15:10:09	79.8 dB	
LASmin	2018/01/16 15:01:31	47.7 dB	
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LAS > 115.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LApeak > 135.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LApeak > 137.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LApeak > 140.0 dB (Exceedence Counts / Duration)	0	0.0 s	

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**
	62.7	62.7	-99.9	62.7	62.7	-99.9	-99.9

LCeq	74.2 dB
LAeq	62.7 dB
LCeq - LAeq	11.6 dB
LAIeq	64.1 dB
LAeq	62.7 dB
LAIeq - LAeq	1.5 dB
# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s
Statistics	
LAS5.00	67.3 dB
LAS10.00	65.0 dB
LAS33.30	60.3 dB
LAS50.00	57.9 dB
LAS66.60	56.0 dB
LAS90.00	52.3 dB

Summary			
Filename	LxT_Data.021		
Serial Number	3827		
Model	SoundExpert™ LxT		
Firmware Version	2.301		
User			
Location			
Job Description			
Note			
Measurement Description			
Start	2018/01/16 15:29:31		
Stop	2018/01/16 15:44:38		
Duration	0:15:06.9		
Run Time	0:15:06.9		
Pause	0:00:00.0		
Pre Calibration	2018/01/16 15:25:49		
Post Calibration	None		
Calibration Deviation	---		
Overall Settings			
RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRMLxT1L		
Microphone Correction	Off		
Integration Method	Linear		
OBA Range	Normal		
OBA Bandwidth	1/1 and 1/3		
OBA Freq. Weighting	A Weighting		
OBA Max Spectrum	At Lmax		
Overload	121.9 dB		
	A	**C**	**Z**
Under Range Peak	**78.1**	75.1	80.1 dB
Under Range Limit	**26.1**	25.2	32.1 dB
Noise Floor	16.3	16.1	22.0 dB
Results			
LAeq	61.5 dB		
LAE	91.0 dB		
EA	141.110 µPa²h		
LApeak (max)	2018/01/16 15:37:24	92.8 dB	
LASmax	2018/01/16 15:37:24	70.3 dB	
LASmin	2018/01/16 15:34:45	53.0 dB	
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LAS > 115.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LApeak > 135.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LApeak > 137.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LApeak > 140.0 dB (Exceedence Counts / Duration)	0	0.0 s	

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**
	61.5	61.5	-99.9	61.5	61.5	-99.9	-99.9

LCeq	73.6 dB
LAeq	61.5 dB
LCeq - LAeq	12.2 dB
LAIeq	62.4 dB
LAeq	61.5 dB
LAIeq - LAeq	0.9 dB
# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s
Statistics	
LAS5.00	65.3 dB
LAS10.00	64.4 dB
LAS33.30	61.6 dB
LAS50.00	60.2 dB
LAS66.60	59.2 dB
LAS90.00	56.7 dB

ATTACHMENT 2

HVAC Specifications

38HDR
Performance™ Series Air Conditioner
with Puron® Refrigerant
1-1/2 to 5 Nominal Tons

turn to the experts™

Product Data

Carrier's Air Conditioners with Puron® refrigerant provide a collection of features unmatched by any other family of equipment. The 38HDR has been designed utilizing Carrier's Puron refrigerant. The environmentally sound refrigerant allows you to make a responsible decision in the protection of the earth's ozone layer.

This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. Refer to the combination ratings in the Product Data for system combinations that meet Energy Star® guidelines.

NOTE: Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory (www.ahridirectory.org) for the most up-to-date ratings information.

INDUSTRY LEADING FEATURES / BENEFITS

Energy Efficiency

- 13 - 15 SEER/10.9 - 12.5 EER

Sound

- Levels as low as 68 dBA

Design Features

- New aesthetics
- Small footprint, same as old model and "stackable"
- WeatherArmor™ cabinet
  - — All steel cabinet construction
  - — Baked on powder paint
  - — Mesh coil guard

Reliability, Quality and Toughness

- Scroll compressor
- Crankcase Heater standard on sizes 030-060
- Factory-supplied filter drier
- High pressure switch
- Low pressure switch
- Line lengths up to 250' (76.2 m)
- Low ambient operation (down to -20°F/-28.9°C) with low ambient accessories.

38HDR

MODEL NUMBER NOMENCLATURE

1	2	3	4	5	6	7	8	9	10	11	12	13
N	N	A	A	A/N	N	N	N	A/N	A/N	A/N	N	N
3	8	H	D	R	0	1	8	A	0	0	3	0
Product Series		HDR = Horizontal Discharge Condensing Unit			Cooling Capacity			Variations	Open	Open	Voltage	Minor Series
38=AC/HP		Major Model			1,000 Btuh Nominal			A=Standard	0=Not Defined	0=Not Defined	3=208/230−1 5=208/230−3 6=460/3	0, 1, 2...

the environmentally sound refrigerant

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

Certified System

ISO 9001

QMI-SAI Global

This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency. Installation of this product should follow all manufacturing refrigerant charging and air flow instructions. **Failure to confirm proper charge and air flow may reduce energy efficiency and shorten equipment life.**

PHYSICAL DATA

UNIT 38HDR	018	024	030	036	048	060
NOMINAL CAPACITY (Tons)	1.5	2.0	2.50	3.0	4.0	5.0
OPERATING WEIGHT lb (kg)	155 (70.3)	180 (81.6)	200 (90.7)	218 (98.9)	284 (128.8)	294 (133.4)
REFRIGERANT TYPE	R−410A					
METERING DEVICE	TXV					
CHARGE lb (kg)	6.3 (2.86)	6.0 (2.73)	8.7 (3.95)	8.7 (3.95)	11.5 (5.23)	12.0 (5.45)
COMPRESSOR						
Type	Scroll					
Oil Charge (POE −oz)	25.0	25.0	25.0	25.0	42.0	42.0
Crankcase Heater (watts)	—	—	40	40	40	40
OUTDOOR FAN						
Rpm/Cfm	840/1720	840/1720	850/3900	850/3900	850/3900	850/3900
Diameter in. (mm)	18 (457)	18 (457)	24 (610)	24 (610)	24 (610)	24 (610)
No. Blades	3	3	3	3	3	3
Motor hp (w)	1/8 (93)	1/8 (93)	1/4 (187)	1/4 (187)	1/4 (187)	1/4 (187)
OUTDOOR COIL						
Face Area (sq ft)	5.8	7.3	12.1	12.1	14.1	14.1
No. Rows	2	2	2	2	2	2
FPI	20	20	20	20	20	20
HIGH PRESSURE SWITCH						
Cut−In (psig) Cutout (psig)	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10
LOW PRESSURE SWITCH						
Cut−In (psig) Cutout (psig)	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5
REFRIGERANT LINES						
Connection Type	Sweat					
Max. Liquid Line* (in.) OD	3/8	3/8	3/8	3/8	3/8	3/8
Rated Vapor Line† (in.) OD	5/8	5/8	3/4	3/4	7/8	1−1/8**
CONTROLS						
Control Voltage‡	24 vac					
System Voltage	208/230 v	208/230 v	208/230 v	208/230 v, Single and 3 Phase, 460 v, 3 Phase		
FINISH	Gray					

* See *Liquid Line Sizing For Cooling Only Systems with Puron Refrigerant* tables.

† Units are rated with 25 ft (7.6 m) of lineset length. See *Vapor Line Sizing and Cooling Capacity Loss* table when using other sizes and lengths of lineset.

‡ 24 v and a minimum of 40 va is provided in the fan coil unit.

** Vapor connection size is 7/8 inch.

FPI – Fins Per Inch

POE – Polyol Ester

REFRIGERANT PIPING LENGTH LIMITATIONS

Liquid Line Sizing and Maximum Total Equivalent Lengths† for Cooling Only Systems with Puron® Refrigerant:

The maximum allowable length of a residential split system depends on the liquid line diameter and vertical separation between indoor and outdoor units.

See Table below for liquid line sizing and maximum lengths :

Maximum Total Equivalent Length
Outdoor Unit BELOW Indoor Unit

Size	Liquid Line Connection	Liquid Line Diam. w/ TXV	AC with Puron Refrigerant Maximum Total Equivalent Length†: Outdoor unit BELOW Indoor Vertical Separation ft (m)								
			0–5 (0–1.5)	6–10 (1.8–3.0)	11–20 (3.4–6.1)	21–30 (6.4–9.1)	31–40 (9.4–12.2)	41–50 (12.5–15.2)	51–60 (15.5–18.3)	61–70 (18.6–21.3)	71–80 (21.6–24.4)
018 AC with Puron	3/8	1/4	150	150	125	100	100	75	– –	– –	– –
		5/16	250*	250*	250*	250*	250*	250*	250*	225*	150
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
024 AC with Puron	3/8	1/4	75	75	75	50	50	– –	– –	– –	– –
		5/16	250*	250*	250*	250*	250*	225*	175	125	100
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
030 AC with Puron	3/8	1/4	30	– –	– –	– –	– –	– –	– –	– –	– –
		5/16	175	225*	200	175	125	100	75	– –	– –
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
036 AC with Puron	3/8	5/16	175	150	150	100	100	100	75	– –	– –
		3//8	250*	250*	250*	250*	250*	250*	250*	250*	250*
048 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	230	160	– –
060 AC with Puron	3/8	3/8	250*	250*	250*	225*	190	150	110	– –	– –

* Maximum actual length not to exceed 200 ft (61 m)

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

– – = outside acceptable range

Maximum Total Equivalent Length
Outdoor Unit ABOVE Indoor Unit

Size	Liquid Line Connection	Liquid Line Diam. w/ TXV	AC with Puron Refrigerant Maximum Total Equivalent Length†: Outdoor unit ABOVE Indoor Vertical Separation ft (m)							
			25 (7.6)	26–50 (7.9–15.2)	51–75 (15.5–22.9)	76–100 (23.2–30.5)	101–125 (30.8–38.1)	126–150 (38.4–45.7)	151–175 (46.0–53.3)	176–200 (53.6–61.0)
018 AC with Puron	3/8	1/4	175	250*	250*	250*	250*	250*	250*	250*
		5/16	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
024 AC with Puron	3/8	1/4	100	125	175	200	225*	250*	250*	250*
		5/16	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
030 AC with Puron	3/8	1/4	30	– –	– –	– –	– –	– –	– –	– –
		5/16	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
036 AC with Puron	3/8	5/16	225*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
048 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	250*	250*
060 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	250*	250*

* Maximum actual length not to exceed 200 ft (61 m)

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

– – = outside acceptable range

REFRIGERANT CHARGE ADJUSTMENTS

Liquid Line Size	Puron Charge oz/ft (g/m)
3/8	0.60 (17.74) (Factory charge for lineset = 9 oz / 266.16 g)
5/16	0.40 (11.83)
1/4	0.27 (7.98)

Units are factory charged for 15 ft (4.6 m) of 3/8” liquid line. The factory charge for 3/8” lineset 9 oz (266.16 g). When using other length or diameter liquid lines, charge adjustments are required per the chart above.

Charging Formula:

[(Lineset oz/ft x total length) – (factory charge for lineset)] = charge adjustment

Example 1: System has 15 ft of line set using existing 1/4“ liquid line. What charge adjustment is required?

Formula: (.27 oz/ft x 15ft) – (9 oz) = (-4.95) oz.

Net result is to remove 4.95 oz of refrigerant from the system

Example 2: System has 45 ft of existing 5/16” liquid line. What is the charge adjustment?

Formula: (.40 oz/ft. x 45ft) – (9 oz.) = 9 oz.

Net result is to add 9 oz of refrigerant to the system

LONG LINE APPLICATIONS

An application is considered Long Line, when the refrigerant level in the system requires the use of accessories to maintain acceptable refrigerant management for systems reliability. See Accessory Usage Guideline table for required accessories. Defining a system as long line depends on the liquid line diameter, actual length of the tubing, and vertical separation between the indoor and outdoor units.

For Air Conditioner systems, the chart below shows when an application is considered Long Line.

AC WITH PURON® REFRIGERANT LONG LINE DESCRIPTION ft (m)
Beyond these lengths, long line accessories are required

Liquid Line Size	Units On Same Level	Outdoor Below Indoor	Outdoor Above Indoor
1/4	No accessories needed within allowed lengths	No accessories needed within allowed lengths	175 (53.3)
5/16	120 (36.6)	50 (15.2) vertical or 120 (36.6) total	120 (36.6)
3/8	80 (24.4)	35 (10.7) vertical or 80 24.4) total	80 (24.4)

Note: See Long Line Guideline for details

VAPOR LINE SIZING AND COOLING CAPACITY LOSS

Acceptable vapor line diameters provide adequate oil return to the compressor while avoiding excessive capacity loss. The suction line diameters shown in the chart below are acceptable for AC systems with Puron refrigerant:

Vapor Line Sizing and Cooling Capacity Losses — Puron® Refrigerant 1-Stage Air Conditioner Applications

Unit Nominal Size (Btuh)	Maximum Liquid Line Diameters (In. OD)	Vapor Line Diameters (In. OD)	Cooling Capacity Loss (%) Total Equivalent Line Length ft. (m)								
			26–50 (7.9–15.2)	51–80 (15.5–24.4)	81–100 (24.7–30.5)	101–125 (30.8–38.1)	126–150 (38.4–45.7)	151–175 (46.0–53.3)	176–200 (53.6–61.0)	201–225 (61.3–68.6)	226–250 (68.9–76.2)
018 1 Stage AC with Puron	3/8	1/2	1	2	3	5	6	7	8	9	11
		5/8	0	1	1	1	2	2	2	3	3
		3/4	0	0	0	0	1	1	1	1	1
024 1 Stage AC with Puron	3/8	5/8	0	1	2	2	3	3	4	5	5
		3/4	0	0	1	1	1	1	1	2	2
		7/8	0	0	0	0	0	1	1	1	1
030 1 Stage AC with Puron	3/8	5/8	1	2	3	3	4	5	6	7	8
		3/4	0	0	1	1	1	2	2	2	3
		7/8	0	0	0	0	1	1	1	1	1
036 1 Stage AC with Puron	3/8	5/8	1	2	4	5	6	8	9	10	12
		3/4	0	1	1	2	2	3	3	4	4
		7/8	0	0	0	1	1	1	1	2	2
048 1 Stage AC with Puron	3/8	3/4	0	1	2	3	4	5	5	6	7
		7/8	0	0	1	1	2	2	2	3	3
		1 1/8	0	0	0	0	0	0	0	1	1
060 1 Stage AC with Puron	3/8	3/4	1	2	4	5	6	7	9	10	11
		7/8	0	1	2	2	3	4	4	5	5
		1 1/8	0	0	0	1	1	1	1	1	1

Applications in this area may be long line and may have height restrictions. See the *Residential Piping and Long Line Guideline*.

ACCESSORY THERMOSTATS

THERMOSTAT / SUBBASE PKG.	DESCRIPTION
TP−PRH01−A	Programmable Thermidistat
TP−NRH01−A	Non−programmable Thermidistat
TP−PAC01	Performance Series Programmable AC Stat
TP−NAC01	Performance Series Non−programmable AC Stat
TSTATCCSEN01−B	Outdoor Air Temperature Sensor
TSTATXXBBP01	Backplate for Builder's Thermostat
TSTATXXNBP01	Backplate for Non−Programmable Thermostat
TSTATXXPBP01	Backplate for Programmable Thermostat
TSTATXXCNV10	Thermostat Conversion Kit (4 to 5 wires) − 10 Pack

ACCESSORIES

KIT NUMBER	KIT NAME	018	024	030	036	048	060
KAACH1401AAA	Crankcase Heater	X	X				
Standard	Crankcase Heater			S	S	S	S
KAAFT0101AAA	Evaporator Freeze Stat	X	X	X	X	X	X
KAATD0101TDR	Time Delay Relay	X	X	X	X	X	X
KAAWS0101AAA	Winter Start Kit (for low ambient)	X	X	X	X	X	X
53DS−900−−−086	Low Ambient Control (Puron)	X	X	X	X	X	X
53DS−900−−−070	Wind Baffle	X					
53DS−900−−−087	Wind Baffle		X				
53DS−900−−−071	Wind Baffle			X	X		
53DS−900−−−088	Wind Baffle					X	X
53DS−900−−−075	Stacking Kit	X	X				
53DS−900−−−076	Stacking Kit			X	X	X	X
53DS−900−−−077	Wall Mounting Kit	X	X				
53DS−900−−−078	Wall Mounting Kit			X	X	X	X

X = Accessory, S = Standard

ACCESSORY USAGE GUIDELINE

ACCESSORY	REQUIRED FOR LOW–AMBIENT COOLING APPLICATIONS (Below 55°F/12.8°C)	REQUIRED FOR LONG LINE APPLICATIONS* (Over 80 ft. / 24.4 m)	REQUIRED FOR SEA COAST APPLICATIONS (Within 2 miles / 3.2 km)
Compressor Start Assist Capacitor and Relay	Yes	Yes	No
Crankcase Heater	Yes	Yes	No
Evaporator Freeze Thermostat	Yes	No	No
Hard Shutoff TXV	Yes	Yes	Yes
Liquid Line Solenoid Valve	No	See Longline Application Guideline	No
Low–ambient Control	Yes	No	No
Winter Start Control	Yes	No	No

* For tubing line sets between 80 and 200 ft. (24.38 and 60.96 m) and/or 35 ft. (10.7 m) vertical differential, refer to Residential Piping and Longline Guideline.

Accessory Description and Usage (Listed Alphabetically)

1. Crankcase Heater

An electric resistance heater which mounts to the base of the compressor to keep the lubricant warm during off cycles. Improves compressor lubrication on restart and minimizes the chance of liquid slugging.

Usage Guideline:

Required in low ambient cooling applications.

Required in long line applications.

Suggested in all commercial applications.

2. Evaporator Freeze Thermostat

An SPST temperature–actuated switch that stops unit operation when evaporator reaches freeze–up conditions.

Usage Guideline:

Required when low ambient kit has been added.

3. Low-Ambient Control

A fan–speed control device activated by a temperature sensor, designed to control condenser fan motor speed in response to the saturated, condensing temperature during operation in cooling mode only. For outdoor temperatures down to -20°F (-28.9°C), it maintains condensing temperature at 100°F ±10°F (37.8°C ± 5.5°C).

Usage Guideline:

A Low Ambient Controller must be used when cooling operation is used at outdoor temperatures below 55°F (12.8°C).

Suggested for all commercial applications.

4. Outdoor Air Temperature Sensor

Designed for use with Carrier Thermostats listed in this publication. This device enables the thermostat to display the outdoor temperature. This device also

is required to enable special thermostat features such as auxiliary heat lock out.

Usage Guideline:

Suggested for all Carrier thermostats listed in this publication.

5. Thermostatic Expansion Valve (TXV)

A modulating flow–control valve which meters refrigerant liquid flow rate into the evaporator in response to the superheat of the refrigerant gas leaving the evaporator.

Kit includes valve, adapter tubes, and external equalizer tube. Hard shut off types are available.

NOTE: When using a hard shut off TXV with single phase reciprocating compressors, a Compressor Start Assist Capacitor and Relay is required.

Usage Guideline:

Accessory required to meet AHRI rating and system reliability, where indoor not equipped.

Hard shut off TXV or LLS required in air conditioner long line applications.

Required for use on all zoning systems.

6. Time-Delay Relay

An SPST delay relay which briefly continues operation of indoor blower motor to provide additional cooling after the compressor cycles off.

NOTE: Most indoor unit controls include this feature. For those that do not, use the guideline below.

Usage Guideline:

Accessory required to meet AHRI rating, where indoor

not equipped.

7. Winter Start Control

This control is designed to alleviate nuisance opening of the low–pressure switch by bypassing it for the first 3 minutes of operation.

ELECTRICAL DATA

38HDR UNIT SIZE	V–PH–Hz	VOLTAGE RANGE*		COMPRESSOR		OUTDOOR FAN MOTOR			MIN CKT AMPS	FUSE/CKT BKR AMPS
		Min	Max	RLA	LRA	FLA	NEC Hp	kW Out		
018–31	208/230–1–60	187	253	9.0	48.0	0.8	0.125	0.09	12.1	20
024–32	208/230–1–60	187	253	13.5	58.3	0.8	0.125	0.09	17.7	25
030–31	208/230–1–60	187	253	14.1	73.0	1.5	0.250	0.19	19.1	30
036–31	208/230–1–60	187	253	14.1	77.0	1.5	0.250	0.19	19.1	30
	208/230–3–60	187	253	9.2	71.0	1.5	0.250	0.19	13.0	20
	460–3–60	414	506	5.6	38.0	0.8	0.250	0.19	7.9	10
048–32	208/230–1–60	187	253	19.9	109.0	1.5	0.250	0.19	26.4	40
	208/230–3–60	187	253	13.1	83.1	1.5	0.250	0.19	17.9	25
	460–3–60	414	506	6.1	41.0	0.8	0.250	0.19	8.4	15
060–32	208/230–1–60	187	253	26.4	134.0	1.5	0.250	0.19	34.5	60
	208/230–3–60	187	253	16.0	110.0	1.5	0.250	0.19	21.5	30
	460–3–60	414	506	7.8	52.0	0.8	0.250	0.19	10.6	15

* Permissible limits of the voltage range at which the unit will operate satisfactorily

FLA – Full Load Amps
HACR – Heating, Air Conditioning, Refrigeration
LRA – Locked Rotor Amps
NEC – National Electrical Code
RLA – Rated Load Amps (compressor)

NOTE: Control circuit is 24–V on all units and requires external power source. Copper wire must be used from service disconnect to unit. All motors/compressors contain internal overload protection.

Complies with 2007 requirements of ASHRAE Standards 90.1

A-WEIGHTED SOUND POWER (dBA)

Unit Size	Standard Rating (dBA)	Typical Octave Band Spectrum (dBA) (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018–31	68	52.0	57.5	60.5	63.5	60.5	57.5	46.5
024–32	69	57.5	61.5	63.0	61.0	60.0	56.0	45.0
030–31	72	56.5	63.0	65.0	66.0	64.0	62.5	57.0
036–31	72	65.0	61.5	63.5	65.0	64.5	61.0	54.5
048–32	72	58.5	61.0	64.0	67.5	66.0	64.0	57.0
060–32	72	63.0	61.5	64.0	66.5	66.0	64.5	55.5

NOTE: Tested in accordance with AHRI Standard 270–08 (not listed in AHRI).

CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

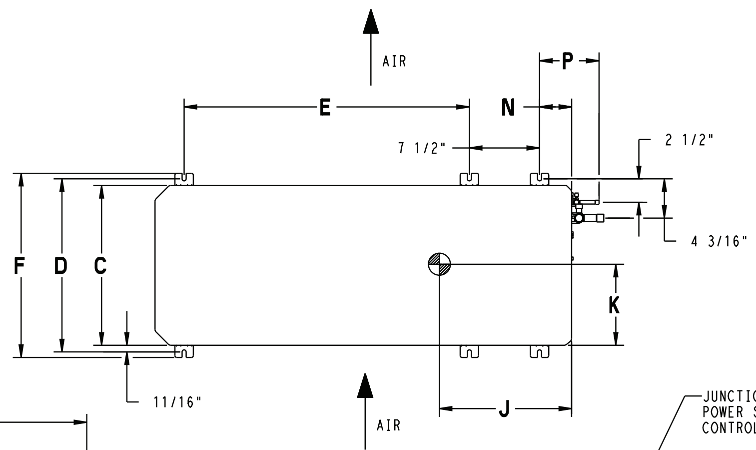
UNIT SIZE–VOLTAGE, SERIES	REQUIRED SUBCOOLING °F (°C)
018–31	12 (6.7)
024–32	12 (6.7)
030–31	12 (6.7)
036–31	12 (6.7)
048–32	12 (6.7)
060–32	12 (6.7)

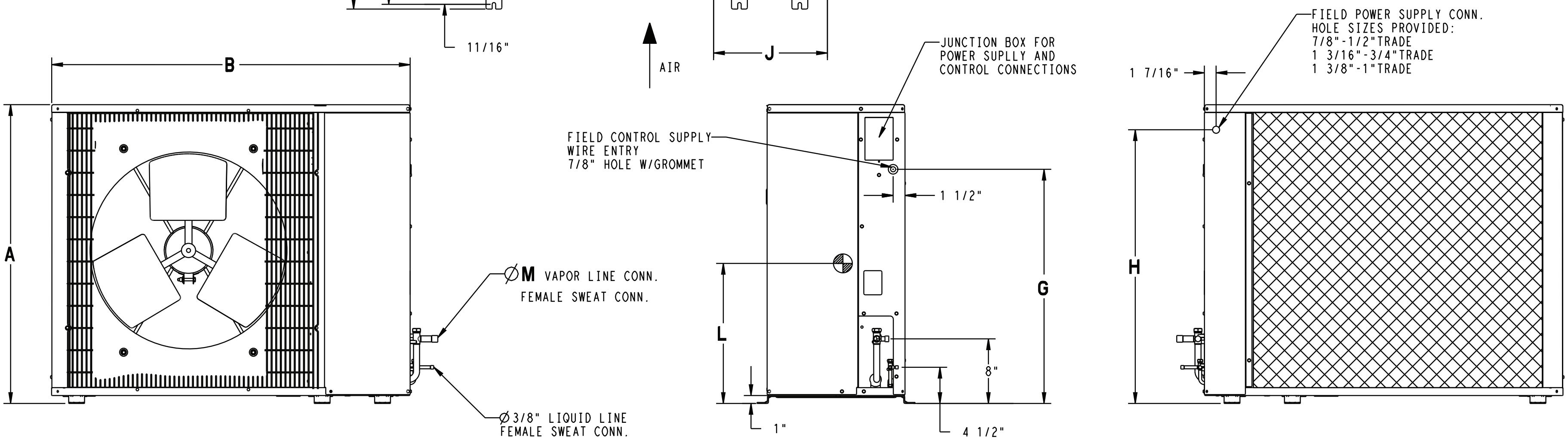
DIMENSIONS - ENGLISH

UNIT	SERIES	ELECTRICAL CHARACTERISTICS				A	B	C	D	E	F	G	H	J	K	L	M	N	P	OPERATING WEIGHT(lbs)	SHIPPING WEIGHT(lbs)	SHIPPING DIMENSIONS (L x W x H)
		208-230-1-60	230-1-60	208/230-3-60	460-3-60																	
38HDR018	1	X	O	O	O	25 1/8"	36 15/16"	14 9/16"	16"	23 7/16"	17 3/16"	17 1/8"	22"	13"	6 5/8"	11 1/4"	5/8"	2 15/16"	6"	155	171	42 9/10" X 18" X 28 1/10"
38HDR024	1,2	X	O	O	O	31 1/8"	36 15/16"	14 9/16"	16"	23 7/16"	17 3/16"	23 1/8"	28"	14"	6 3/4"	11 5/8"	5/8"	2 15/16"	6"	180	198	42 9/10" X 18" X 34 1/10"
38HDR030	1	X	O	O	O	37 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	13 11/16"	8 1/8"	15 7/8"	3/4"	3 7/16"	6 1/2"	200	223	50 1/2" X 20 1/2" X 40 2/10"
38HDR036	1	X	O	X	X	37 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	13 11/16"	8 1/8"	15 7/8"	3/4"	3 7/16"	6 1/2"	218	240	50 1/2" X 20 1/2" X 40 2/10"
38HDR048	1,2	X	O	X	X	43 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	35 3/16"	40 1/16"	14 1/2"	8 1/2"	18 7/8"	7/8"	3 7/16"	6 1/2"	284	309	50 1/2" X 20 1/2" X 46 2/10"
38HDR060	1,2	X	O	X	X	43 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	35 3/16"	40 1/16"	14 1/2"	8 1/2"	18 7/8"	7/8"	3 7/16"	6 1/2"	294	319	50 1/2" X 20 1/2" X 46 2/10"

X = YES
O = NO

1. REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 6" MIN CLEARANCE ON COIL SIDE AND COIL END AND 36" MIN CLEARANCE ON COMPRESSOR END AND FAN SIDE. WITH FAN FACING WALL; ALLOW 8" MIN CLEARANCE ON FAN SIDE AND COIL END AND 36" MIN CLEARANCE ON COMPRESSOR END AND COIL SIDE. WITH MULTI UNIT APPLICATION; ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.
2. MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 55°F, MAX. 125°F.
3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.
4. CENTER OF GRAVITY
5. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.





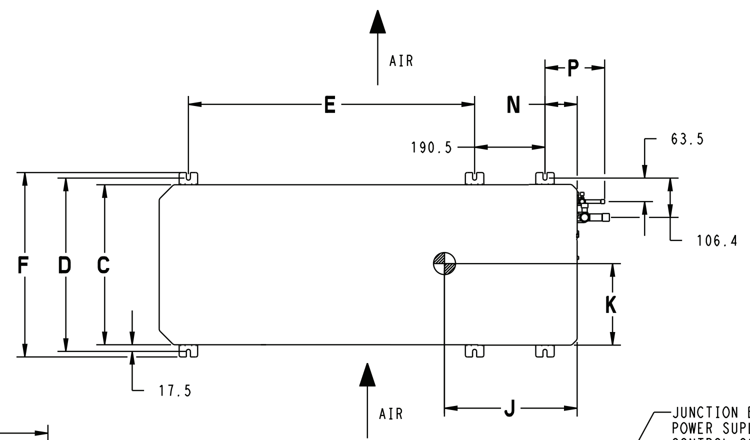
UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18,24	23" X 42"
30,36,48,60	24" X 50"

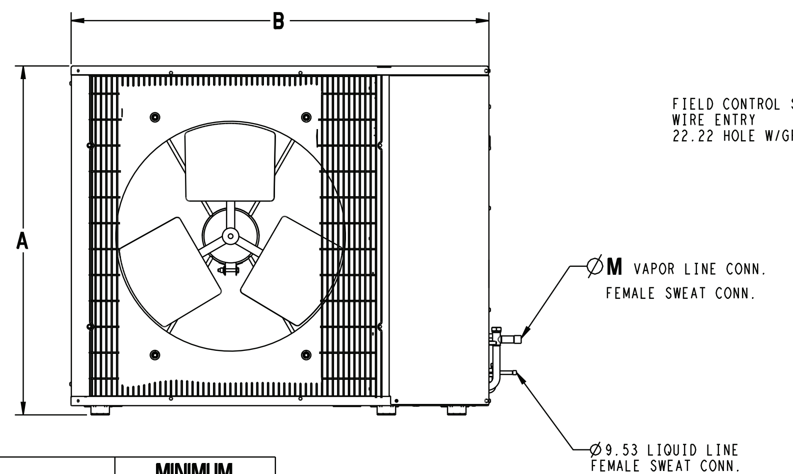
DIMENSIONS - SI

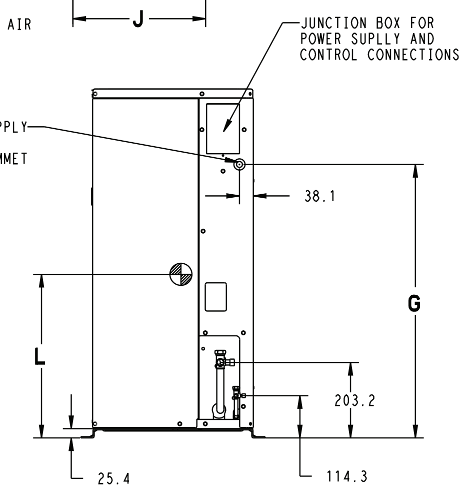
UNIT	SERIES	ELECTRICAL CHARACTERISTICS 208-230-1-60	230-1-60	208/230-3-60	460-3-60	A	B	C	D	E	F	G	H	J	K	L	M	N	P	OPERATING WEIGHT(KG)	SHIPPING WEIGHT(KG)	SHIPPING DIMENSIONS (L x W x H)
38HDR018	1	X	O	O	O	638.2	938.2	369.9	406.4	595.3	436.6	435.0	558.8	330.2	168.3	285.8	15.9	74.6	152.4	70.4	77.7	1090.2 X 457.7 X 714.3
38HDR024	1,2	X	O	O	O	790.6	938.2	369.9	406.4	595.3	436.6	587.4	711.2	355.6	171.5	295.3	15.9	74.6	152.4	81.8	90.0	1090.2 X 457.7 X 866.7
38HDR030	1	X	O	O	O	944.6	1131.9	433.4	468.3	774.7	498.5	741.4	865.2	347.7	206.4	403.2	19.0	87.3	165.1	90.9	101.4	1282.7 X 520.7 X 1020.7
38HDR036	1	X	O	X	X	944.6	1131.9	433.4	468.3	774.7	498.5	741.4	865.2	347.7	206.4	403.2	19.0	87.3	165.1	99.0	109.0	1282.7 X 520.7 X 1020.7
38HDR048	1,2	X	O	X	X	1097.0	1131.9	433.4	468.3	774.7	498.5	893.8	1017.6	368.3	215.9	479.4	22.2	87.3	165.1	129.0	140.4	1282.7 X 520.7 X 1173.1
38HDR060	1,2	X	O	X	X	1097.0	1131.9	433.4	468.3	774.7	498.5	893.8	1017.6	368.3	215.9	479.4	22.2	87.3	165.1	133.6	145.0	1282.7 X 520.7 X 1173.1

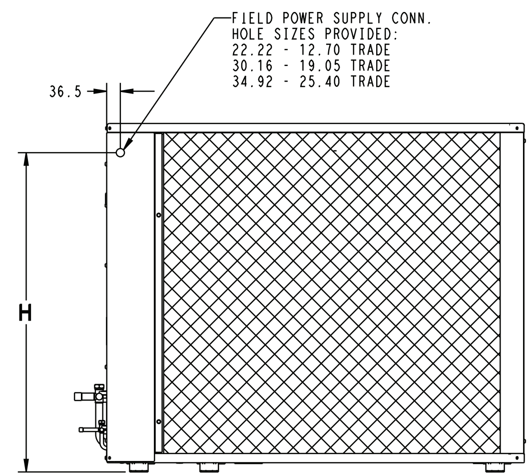
X = YES
O = NO

1. REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 152.4 MIN CLEARANCE ON COIL SIDE AND COIL END AND 914.4 MIN CLEARANCE ON COMPRESSOR END AND FAN SIDE. WITH FAN FACING WALL; ALLOW 203.2 MIN CLEARANCE ON FAN SIDE AND COIL END AND 914.4 MIN CLEARANCE ON COMPRESSOR END AND COIL SIDE. WITH MULTI UNIT APPLICATION; ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.
2. MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 12.8°C, MAX. 51.7°C.
3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.
4. CENTER OF GRAVITY
5. ALL DIMENSIONS ARE IN "MM" UNLESS NOTED.









UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18,24	584.2 X 1066.8
30,36,48,60	609.6 X 1270.0

TESTED AHRI COMBINATION RATINGS*

NOTE: Ratings contained in this document are subject to change at any time.

For AHRI ratings certificates, please refer to the AHRI directory www.ahridirectory.org
Additional ratings and system combinations can be accessed via the Carrier database at: http://cactaxcredits.info/carrier-ratings/ac_ratings_srch.php

Equipment performance calculator can be accessed at: http://rpmob.wrightsoft.com/

Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
38HDR024–32	CNPV*2414A**+TDR		23,400	11.0	13.0
38HDR030–31	CNPV*3014A**+TDR		28,000	11.0	13.0
38HDR036–31	CNPV*4221A**+TDR		33,400	11.0	13.0
38HDR036–51	CNPV*4221A**+TDR		33,400	11.0	13.0
38HDR036–61	CNPV*4221A**+TDR		33,400	11.0	13.0
38HDR048–32	CNPV*4821A**+TDR		47,000	11.0	13.0
38HDR048–52	CNPV*4821A**+TDR		47,000	11.0	13.0
38HDR048–62	CNPV*4821A**+TDR		47,000	11.0	13.0
38HDR060–32	CNPV*6024A**+TDR		57,000	11.0	13.0
38HDR060–52	CNPV*6024A**+TDR		57,000	11.0	13.0
38HDR060–62	CNPV*6024A**+TDR		57,000	11.0	13.0

* AHRI = Air Conditioning, Heating & Refrigeration Institute
EER — Energy Efficiency Ratio
SEER — Seasonal Energy Efficiency Ratio
TDR — Time–Delay Relay. In most cases, only 1 method should be used to achieve TDR function. Using more than 1 method in a system may cause degradation in performance. Use either the accessory Time–Delay Relay KAATD0101TDR or a furnace equipped with TDR. Most Carrier furnaces are equipped with TDR.

NOTES:
1. Ratings are net values reflecting the effects of circulating fan motor heat. Supplemental electric heat is not included.
2. Tested outdoor/indoor combinations have been tested in accordance with DOE test procedures for central air conditioners. Ratings for other combinations are determined under DOE computer simulation procedures.
3. Determine actual CFM values obtainable for your system by referring to fan performance data in fan coil or furnace coil literature.
4. Do not apply with capillary tube coils as performance and reliability are significantly affected.

DETAILED COOLING CAPACITIES*

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR018 Outdoor Section With CNPV*1814A Indoor Section**																			
525	72 (22.2)	20.28	9.40	1.22	19.31	9.07	1.36	18.30	8.73	1.52	17.26	8.38	1.69	16.14	8.01	1.87	14.90	7.61	2.07
	67(19.4)	18.53	11.50	1.22	17.65	11.17	1.36	16.72	10.82	1.52	15.76	10.47	1.69	14.72	10.09	1.87	13.59	9.69	2.07
	62 (16.7)	16.93	13.58	1.23	16.13	13.24	1.37	15.29	12.89	1.52	14.43	12.52	1.69	13.57	13.57	1.87	12.71	12.71	2.07
	57 (13.9)	16.35	16.35	1.23	15.72	15.72	1.37	15.05	15.05	1.52	14.34	14.34	1.69	13.57	13.57	1.87	12.71	12.71	2.07
600	72(22.2)	20.65	9.87	1.25	19.63	9.53	1.39	18.59	9.18	1.54	17.50	8.83	1.71	16.34	8.46	1.90	15.05	8.05	2.10
	67(19.4)	18.90	12.25	1.25	17.97	11.91	1.39	17.00	11.56	1.55	16.00	11.20	1.72	14.93	10.82	1.90	13.75	10.41	2.10
	62 (16.7)	17.33	14.61	1.25	16.51	14.26	1.39	15.67	15.61	1.55	14.91	14.91	1.72	14.08	14.08	1.90	13.16	13.16	2.10
	57 (13.9)	17.07	17.07	1.25	16.39	16.39	1.39	15.67	15.67	1.55	14.91	14.91	1.72	14.08	14.08	1.90	13.16	13.16	2.10
675	72 (22.2)	20.91	10.30	1.27	19.86	9.96	1.41	18.78	9.61	1.57	17.67	9.26	1.74	16.47	8.88	1.93	15.15	8.46	2.13
	67 (19.4)	19.16	12.97	1.27	18.20	12.62	1.42	17.20	12.27	1.57	16.18	11.90	1.74	15.07	11.52	1.93	13.87	11.09	2.13
	62 (16.7)	17.70	17.52	1.28	16.94	16.94	1.42	16.17	16.17	1.57	15.37	15.37	1.74	14.49	14.49	1.93	13.52	13.52	2.13
	57(13.9)	17.67	17.67	1.28	16.94	16.94	1.42	16.17	16.17	1.57	15.37	15.37	1.74	14.49	14.49	1.93	13.52	13.52	2.13

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR024 Outdoor Section With CNPV*2414A Indoor Section**																			
700	72 (22.2)	28.11	13.59	1.69	26.70	13.09	1.89	25.17	12.55	2.10	23.54	11.98	2.33	21.76	11.38	2.58	19.78	10.71	2.84
	67(19.4)	25.68	16.61	1.68	24.41	16.11	1.87	23.04	15.58	2.09	21.58	15.02	2.32	19.98	14.42	2.57	18.21	13.77	2.83
	62 (16.7)	23.47	19.61	1.67	22.34	19.11	1.86	21.13	18.58	2.08	19.86	18.01	2.31	18.57	18.57	2.55	17.23	17.23	2.82
	57 (13.9)	22.67	22.67	1.67	21.77	21.77	1.86	20.81	20.81	2.07	19.75	19.75	2.31	18.57	18.57	2.55	17.23	17.23	2.82
800	72(22.2)	28.62	14.25	1.73	27.14	13.73	1.93	25.53	13.18	2.14	23.83	12.61	2.37	21.98	11.99	2.62	19.92	11.32	2.88
	67(19.4)	26.18	17.67	1.72	24.84	17.16	1.91	23.40	16.61	2.13	21.88	16.05	2.36	20.22	15.43	2.61	18.38	14.76	2.87
	62 (16.7)	24.02	21.07	1.71	22.85	20.54	1.90	21.63	21.51	2.12	20.48	20.48	2.35	19.20	19.20	2.60	17.75	17.75	2.86
	57 (13.9)	23.64	23.64	1.71	22.68	22.68	1.90	21.62	21.62	2.12	20.48	20.48	2.35	19.20	19.20	2.60	17.75	17.75	2.86
900	72 (22.2)	28.99	14.87	1.77	27.45	14.34	1.96	25.78	13.78	2.18	24.03	13.20	2.41	22.12	12.57	2.66	20.00	11.89	2.92
	67 (19.4)	26.54	18.68	1.76	25.15	18.16	1.95	23.66	17.61	2.17	22.09	17.03	2.40	20.38	16.40	2.65	18.50	15.71	2.91
	62 (16.7)	24.51	22.41	1.75	23.41	23.41	1.94	22.28	22.28	2.16	21.06	21.06	2.39	19.70	19.70	2.64	18.15	18.15	2.91
	57(13.9)	24.45	24.45	1.75	23.41	23.41	1.94	22.28	22.28	2.16	21.06	21.06	2.39	19.70	19.70	2.64	18.15	18.15	2.91

See notes on pg. 13

DETAILED COOLING CAPACITIES* (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR030 Outdoor Section With CNPV*3014A** Indoor Section																			
875	72 (22.2)	33.74	16.03	2.06	32.29	15.52	2.29	30.76	14.99	2.54	29.12	14.43	2.81	27.36	13.84	3.11	25.42	13.19	3.44
	67(19.4)	30.65	19.58	2.06	29.32	19.06	2.29	27.90	18.51	2.54	26.39	17.94	2.81	24.76	17.34	3.11	22.97	16.69	3.43
	62 (16.7)	28.07	23.01	2.07	26.73	22.59	2.29	25.47	22.03	2.54	24.10	21.45	2.81	22.76	22.72	3.11	21.45	21.45	3.43
	57 (13.9)	27.14	27.14	2.07	26.16	26.16	2.29	25.11	25.11	2.53	24.01	24.01	2.80	22.78	22.78	3.11	21.43	21.43	3.43
1000	72(22.2)	34.29	16.79	2.11	32.87	16.29	2.34	31.28	15.69	2.58	29.58	15.18	2.86	27.57	14.54	3.17	25.64	13.91	3.49
	67(19.4)	31.27	20.81	2.11	29.84	20.29	2.34	28.40	19.75	2.58	26.82	19.17	2.86	24.99	18.52	3.16	23.21	17.87	3.49
	62 (16.7)	28.72	24.92	2.11	27.38	24.26	2.34	26.11	26.11	2.58	24.94	24.94	2.85	23.54	23.54	3.16	22.22	22.22	3.48
	57 (13.9)	28.28	28.28	2.11	27.23	27.23	2.34	26.13	26.13	2.58	24.94	24.94	2.85	23.54	23.54	3.16	22.22	22.22	3.48
1125	72 (22.2)	34.76	17.52	2.16	33.30	17.00	2.39	31.65	16.46	2.63	29.90	15.89	2.91	28.03	15.27	3.21	25.95	14.60	3.53
	67 (19.4)	31.86	21.48	2.16	30.25	21.46	2.38	28.76	20.92	2.63	27.14	20.32	2.90	25.39	19.69	3.21	23.44	18.98	3.54
	62 (16.7)	29.27	29.04	2.16	28.12	28.12	2.38	26.98	26.98	2.63	25.71	25.71	2.90	24.35	24.35	3.20	22.84	22.84	3.53
	57(13.9)	29.23	29.23	2.16	28.13	28.13	2.38	26.99	26.99	2.63	25.71	25.71	2.90	24.23	24.23	3.21	22.85	22.85	3.53

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR036 Outdoor Section With CNPV*4221A** Indoor Section																			
1050	72 (22.2)	39.85	18.85	2.42	38.03	18.23	2.68	36.08	17.58	2.98	33.99	16.89	3.30	31.72	16.14	3.65	29.20	15.33	4.03
	67(19.4)	36.33	23.19	2.42	34.67	22.57	2.68	32.91	21.91	2.98	31.02	21.23	3.30	28.99	20.49	3.65	26.73	19.69	4.04
	62 (16.7)	33.23	27.51	2.42	31.75	26.88	2.68	30.20	26.20	2.98	28.60	28.45	3.30	27.06	27.06	3.65	25.34	25.34	4.03
	57 (13.9)	32.46	32.46	2.42	31.26	31.26	2.68	29.98	29.98	2.98	28.59	28.59	3.30	27.06	27.06	3.65	25.34	25.34	4.03
1200	72(22.2)	40.51	19.77	2.48	38.61	19.14	2.74	36.57	18.47	3.04	34.40	17.77	3.36	32.04	17.01	3.71	29.42	16.18	4.09
	67(19.4)	36.97	24.67	2.48	35.23	24.04	2.74	33.40	23.38	3.04	31.45	22.68	3.36	29.33	21.93	3.71	27.00	21.10	4.09
	62 (16.7)	34.01	29.52	2.48	32.53	32.23	2.74	31.11	31.11	3.04	29.61	29.61	3.36	27.97	27.97	3.71	26.12	26.12	4.09
	57 (13.9)	33.78	33.78	2.48	32.49	32.49	2.74	31.11	31.11	3.04	29.62	29.62	3.36	27.97	27.97	3.71	26.12	26.12	4.09
1350	72 (22.2)	40.99	20.64	2.54	39.02	19.99	2.80	36.91	19.31	3.09	34.67	18.60	3.42	32.24	17.83	3.77	29.54	16.99	4.15
	67 (19.4)	37.43	26.09	2.54	35.65	25.45	2.80	33.76	24.78	3.10	31.75	24.06	3.42	29.58	23.29	3.77	27.20	22.42	4.15
	62 (16.7)	34.86	34.86	2.54	33.49	33.49	2.80	32.02	32.02	3.10	30.44	30.44	3.42	28.70	28.70	3.77	26.73	26.73	4.15
	57(13.9)	34.86	34.86	2.54	33.49	33.49	2.80	32.03	32.03	3.10	30.44	30.44	3.42	28.70	28.70	3.77	26.73	26.73	4.15

See notes on pg. 13

DETAILED COOLING CAPACITIES* (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR048 Outdoor Section With CNPV*4821A** Indoor Section																			
1460	72 (22.2)	57.22	27.09	3.31	54.16	26.03	3.74	50.83	24.90	4.20	47.23	23.69	4.69	43.24	22.38	5.21	38.87	20.99	5.76
	67(19.4)	52.21	33.21	3.33	49.49	32.17	3.76	46.57	31.08	4.22	43.40	29.91	4.71	39.95	28.66	5.23	36.03	27.26	5.77
	62 (16.7)	47.74	39.31	3.35	45.37	38.29	3.78	42.88	37.19	4.23	40.25	39.91	4.72	37.64	37.64	5.23	34.63	34.63	5.78
	57 (13.9)	46.44	46.44	3.36	44.53	44.53	3.78	42.48	42.48	4.23	40.21	40.21	4.72	37.65	37.65	5.23	34.63	34.63	5.78
1650	72(22.2)	58.13	28.26	3.37	54.91	27.17	3.81	51.42	26.01	4.27	47.67	24.78	4.76	43.52	23.45	5.28	39.26	22.10	5.84
	67(19.4)	53.07	35.09	3.40	50.21	34.03	3.83	47.16	32.91	4.29	43.87	31.73	4.78	40.28	30.44	5.30	36.23	28.99	5.85
	62 (16.7)	48.75	41.89	3.42	46.32	40.79	3.85	43.85	43.85	4.30	41.42	41.42	4.79	38.64	38.64	5.31	35.37	35.37	5.85
	57 (13.9)	48.17	48.17	3.43	46.11	46.11	3.85	43.88	43.88	4.30	41.42	41.42	4.79	38.64	38.64	5.31	35.37	35.37	5.85
1850	72 (22.2)	58.83	29.41	3.45	55.48	28.31	3.88	51.86	27.12	4.35	47.97	25.87	4.84	43.73	24.52	5.36	39.89	23.26	5.92
	67 (19.4)	53.74	36.97	3.48	50.78	35.90	3.91	47.62	34.76	4.37	44.22	33.55	4.86	40.51	32.22	5.38	36.39	30.70	5.93
	62 (16.7)	49.74	44.35	3.50	47.48	47.48	3.92	45.09	45.09	4.38	42.44	42.44	4.87	39.46	39.46	5.38	35.96	35.96	5.93
	57(13.9)	49.69	49.69	3.50	47.49	47.49	3.92	45.09	45.09	4.38	42.45	42.45	4.87	39.46	39.46	5.38	35.97	35.97	5.93

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR060 Outdoor Section With CNPV*6024A** Indoor Section																			
1750	72 (22.2)	68.88	33.36	4.20	65.13	32.05	4.64	60.97	30.62	5.12	56.47	29.10	5.64	51.66	27.52	6.20	46.31	25.80	6.80
	67(19.4)	63.28	41.18	4.15	59.98	39.91	4.59	56.34	38.52	5.08	52.38	37.05	5.60	48.00	35.44	6.17	43.23	33.69	6.77
	62 (16.7)	58.24	48.95	4.11	55.37	47.69	4.55	52.27	46.30	5.04	48.91	48.85	5.57	45.63	45.63	6.15	41.69	41.69	6.76
	57 (13.9)	56.77	56.77	4.09	54.45	54.45	4.54	51.86	51.86	5.03	48.95	48.95	5.57	45.63	45.63	6.15	41.69	41.69	6.76
2000	72(22.2)	69.89	34.93	4.31	65.94	33.59	4.75	61.58	32.12	5.23	56.96	30.59	5.74	52.01	29.02	6.31	47.30	27.45	6.92
	67(19.4)	64.28	43.75	4.26	60.81	42.45	4.70	57.00	41.04	5.18	52.88	39.53	5.71	48.32	37.86	6.27	43.82	36.17	6.88
	62 (16.7)	59.48	52.47	4.22	56.55	51.08	4.66	53.58	53.58	5.15	50.40	50.40	5.68	46.78	46.78	6.26	42.62	42.62	6.87
	57 (13.9)	58.96	58.96	4.21	56.42	56.42	4.66	53.58	53.58	5.15	50.40	50.40	5.68	46.78	46.78	6.26	42.60	42.60	6.87
2250	72 (22.2)	70.60	36.41	4.42	66.50	35.04	4.86	61.97	33.55	5.33	57.25	32.02	5.85	52.14	30.44	6.41	48.41	29.01	7.04
	67 (19.4)	65.01	46.21	4.37	61.41	44.89	4.81	57.46	43.44	5.29	53.20	41.88	5.81	48.56	40.17	6.37	44.28	38.42	6.99
	62 (16.7)	60.67	60.67	4.33	58.00	58.00	4.78	54.94	54.94	5.26	51.52	51.52	5.79	47.63	47.63	6.36	43.18	43.18	6.98
	57(13.9)	60.73	60.73	4.33	58.00	58.00	4.78	54.94	54.94	5.26	51.52	51.52	5.79	47.63	47.63	6.36	43.14	43.14	6.98

NOTE: When the required data fall between the published data, interpolation may be performed. Extrapolation is not an acceptable practice.

* Detailed cooling capacities are based on indoor and outdoor unit at the same elevation per the latest edition of AHRI standard 210/240. If additional tubing length and/or indoor unit is located above outdoor unit, a slight variation in capacity may occur.

† Total and sensible capacities are net capacities. Blower motor heat has been subtracted.

‡ Sensible capacities shown are based on 80° F (27° C) entering air at the indoor coil. For sensible capacities at other than 80° F (27° C), deduct 835 Btuh (245 kW) per 1000 CFM (480 L/S) of indoor coil air for each degree below 80° F (27° C), or add 835 Btuh (245 kW) per 1000 CFM (480 L/S) of indoor coil air per degree above 80° F (27° C).
When the required data fall between the published data, interpolation may be performed.

** Total system kW is total of indoor and outdoor unit kilowatts.

CONDENSER ONLY RATINGS*

SST °F (°C)		CONDENSER ENTERING AIR TEMPERATURES °F (°C)							
		55 (12.8)	65 (18.3)	75 (23.9)	85 (29.4)	95 (35)	105 (40.6)	115 (46.1)	125 (51.7)
38HDR018−31									
30 (−1.6)	TCG	16.20	15.30	14.30	13.40	12.40	11.40	10.30	9.20
	SDT	67.40	77.00	86.50	96.00	105.50	114.90	124.40	133.70
	KW	0.86	0.98	1.11	1.26	1.42	1.59	1.77	1.96
35 (1.7)	TCG	17.90	16.90	15.90	14.80	13.80	12.70	11.60	10.40
	SDT	68.50	78.00	87.50	97.00	106.40	115.80	125.20	134.50
	KW	0.86	0.98	1.11	1.26	1.42	1.59	1.78	1.98
40 (4.4)	TCG	19.70	18.60	17.50	16.40	15.20	14.10	12.90	11.60
	SDT	69.70	79.10	88.60	98.00	107.40	116.80	126.10	135.30
	KW	0.85	0.97	1.11	1.26	1.42	1.60	1.79	1.99
45 (7.2)	TCG	21.60	20.40	19.20	18.00	16.80	15.50	14.20	12.80
	SDT	70.90	80.30	89.70	99.00	108.40	117.70	127.00	136.10
	KW	0.85	0.97	1.11	1.26	1.42	1.60	1.79	2.00
50 (10)	TCG	23.60	22.30	21.10	19.70	18.40	17.00	15.60	14.10
	SDT	72.20	81.50	90.80	100.10	109.40	118.60	127.80	136.90
	KW	0.85	0.97	1.11	1.26	1.42	1.60	1.79	2.00
55 (12.8)	TCG	25.70	24.30	22.90	21.50	20.00	18.60	17.00	15.40
	SDT	73.50	82.70	92.00	101.20	110.40	119.60	128.70	137.70
	KW	0.85	0.97	1.10	1.25	1.42	1.60	1.79	2.00
38HDR024−32									
30 (−1.6)	TCG	22.10	20.90	19.60	18.30	16.90	15.50	14.00	12.40
	SDT	69.00	78.50	88.00	97.40	106.80	116.10	125.30	134.50
	KW	1.08	1.24	1.41	1.60	1.80	2.02	2.25	2.48
35 (1.7)	TCG	24.30	23.00	21.70	20.30	18.80	17.20	15.60	13.80
	SDT	70.30	79.80	89.20	98.60	107.90	117.10	126.30	135.40
	KW	1.09	1.24	1.42	1.61	1.82	2.04	2.28	2.52
40 (4.4)	TCG	26.80	25.30	23.90	22.30	20.70	19.00	17.20	15.30
	SDT	71.70	81.10	90.50	99.80	109.10	118.20	127.30	136.30
	KW	1.10	1.26	1.43	1.62	1.83	2.06	2.30	2.55
45 (7.2)	TCG	29.40	27.80	26.20	24.50	22.70	20.90	18.90	16.70
	SDT	73.20	82.60	91.90	101.10	110.20	119.30	128.30	137.10
	KW	1.11	1.27	1.44	1.64	1.85	2.08	2.32	2.57
50 (10)	TCG	32.10	30.40	28.60	26.80	24.80	22.70	20.50	18.10
	SDT	74.80	84.10	93.30	102.40	111.50	120.40	129.20	137.90
	KW	1.12	1.28	1.46	1.65	1.86	2.09	2.33	2.59
55 (12.8)	TCG	35.00	33.10	31.20	29.10	26.90	24.60	22.20	19.50
	SDT	76.40	85.60	94.70	103.80	112.70	121.50	130.20	138.60
	KW	1.13	1.29	1.47	1.66	1.88	2.10	2.35	2.60
38HDR030−31									
30 (−1.6)	TCG	26.20	24.70	23.20	21.70	20.10	18.40	16.80	15.30
	SDT	72.00	82.30	92.90	103.80	115.00	126.90	139.00	148.90
	KW	1.30	1.48	1.69	1.92	2.19	2.50	2.84	3.12
35 (1.7)	TCG	28.80	27.30	25.70	24.10	22.40	20.60	18.90	17.40
	SDT	73.10	83.50	94.00	104.80	116.10	127.70	139.50	149.30
	KW	1.30	1.49	1.69	1.93	2.21	2.52	2.86	3.15
40 (4.4)	TCG	31.70	30.10	28.40	26.60	24.80	23.00	21.20	19.60
	SDT	74.30	84.70	95.20	105.90	117.10	128.60	140.00	149.70
	KW	1.31	1.49	1.70	1.94	2.22	2.53	2.87	3.18
45 (7.2)	TCG	34.80	33.10	31.20	29.40	27.40	25.50	23.60	21.90
	SDT	75.60	85.90	96.40	107.10	118.10	129.40	140.60	150.10
	KW	1.31	1.50	1.71	1.95	2.22	2.54	2.88	3.19
50 (10)	TCG	38.20	36.20	34.30	32.30	30.30	28.20	26.20	24.40
	SDT	76.90	87.20	97.60	108.20	119.20	130.30	141.10	150.50
	KW	1.32	1.50	1.71	1.95	2.23	2.55	2.89	3.20
55 (12.8)	TCG	41.70	39.70	37.60	35.50	33.30	31.10	29.00	27.10
	SDT	78.30	88.50	98.90	109.40	120.20	131.20	141.80	150.90
	KW	1.32	1.51	1.72	1.96	2.24	2.55	2.89	3.20
38HDR036−31									
30 (−1.6)	TCG	30.10	28.50	26.80	25.10	23.30	21.50	19.60	17.60
	SDT	70.90	80.80	90.90	101.00	111.20	121.60	132.30	143.30
	KW	1.50	1.71	1.94	2.20	2.50	2.83	3.19	3.58
35 (1.7)	TCG	33.20	31.50	29.70	27.80	25.90	24.00	21.90	19.90
	SDT	72.00	82.00	92.00	102.10	112.30	122.80	133.30	143.80
	KW	1.50	1.71	1.95	2.21	2.52	2.85	3.21	3.60
40 (4.4)	TCG	36.50	34.60	32.70	30.70	28.70	26.60	24.40	22.30
	SDT	73.30	83.20	93.20	103.20	113.40	123.60	134.10	144.50
	KW	1.51	1.72	1.95	2.22	2.52	2.85	3.23	3.63
45 (7.2)	TCG	40.10	38.10	36.00	33.80	31.70	29.40	27.10	24.80
	SDT	74.60	84.40	94.40	104.50	113.80	124.50	135.20	145.30
	KW	1.51	1.72	1.96	2.23	2.51	2.86	3.26	3.65
50 (10)	TCG	43.90	41.70	39.50	37.10	34.90	32.40	30.00	27.60
	SDT	75.90	85.80	95.70	105.90	115.50	125.90	136.20	146.00
	KW	1.52	1.73	1.97	2.24	2.54	2.89	3.27	3.66
55 (12.8)	TCG	48.00	45.70	43.30	40.70	38.30	35.70	33.10	30.50
	SDT	77.40	87.10	97.00	107.10	116.70	126.80	137.00	146.70
	KW	1.53	1.74	1.98	2.25	2.55	2.89	3.28	3.66

See notes on page 15

CONDENSER ONLY RATINGS* CONTINUED

SST °F (°C)		CONDENSER ENTERING AIR TEMPERATURES °F (°C)							
		55 (12.8)	65 (18.3)	75 (23.9)	85 (29.4)	95 (35)	105 (40.6)	115 (46.1)	125 (51.7)
38HDR048–32									
30 (–1.6)	TCG	48.40	45.50	42.50	39.50	36.20	32.90	30.60	28.10
	SDT	67.90	77.30	86.70	96.00	105.40	114.70	124.30	133.80
	KW	2.05	2.39	2.75	3.15	3.56	4.01	4.49	5.00
35 (1.7)	TCG	53.40	50.20	46.90	43.40	39.60	35.70	34.00	25.50
	SDT	69.10	78.40	87.80	97.00	106.20	115.40	125.10	133.00
	KW	2.02	2.37	2.74	3.14	3.56	4.01	4.51	4.99
40 (4.4)	TCG	58.70	55.10	51.40	47.50	43.10	38.30	33.00	27.10
	SDT	70.40	79.60	88.90	98.00	107.10	116.10	124.80	133.40
	KW	1.99	2.35	2.72	3.13	3.55	4.01	4.49	4.99
45 (7.2)	TCG	64.30	60.30	56.20	51.60	46.90	41.20	35.20	28.90
	SDT	71.80	80.90	90.00	99.10	108.10	116.80	125.40	133.80
	KW	1.96	2.32	2.70	3.11	3.54	4.00	4.48	4.99
50 (10)	TCG	70.30	65.80	61.10	55.80	50.40	44.20	37.30	34.60
	SDT	73.30	82.30	91.20	100.10	108.90	117.50	125.90	135.30
	KW	1.92	2.29	2.68	3.09	3.52	3.98	4.46	5.01
55 (12.8)	TCG	76.50	71.40	66.00	60.30	54.00	47.00	50.70	41.10
	SDT	74.80	83.60	92.50	101.20	109.80	118.20	129.40	137.00
	KW	1.88	2.25	2.64	3.06	3.49	3.95	4.57	5.05
38HDR060–32									
30 (–1.6)	TCG	59.30	55.30	50.90	46.20	40.40	37.90	33.80	30.30
	SDT	70.10	79.30	88.40	97.40	106.20	115.80	124.90	134.20
	KW	2.59	2.93	3.31	3.73	4.19	4.72	5.31	5.90
35 (1.7)	TCG	64.70	60.20	55.50	50.00	43.30	42.40	31.50	33.10
	SDT	71.40	80.50	89.50	98.40	106.90	116.90	124.20	134.90
	KW	2.62	2.97	3.34	3.76	4.21	4.76	5.25	5.93
40 (4.4)	TCG	69.90	65.30	60.10	53.80	55.90	47.40	31.70	35.60
	SDT	72.70	81.70	90.60	99.30	110.10	118.10	124.20	135.50
	KW	2.66	3.00	3.38	3.78	4.34	4.81	5.24	5.96
45 (7.2)	TCG	76.00	70.80	64.80	57.40	56.00	54.60	48.50	47.70
	SDT	74.10	83.00	91.80	100.20	110.00	119.90	128.60	138.80
	KW	2.71	3.04	3.40	3.80	4.32	4.89	5.43	6.08
50 (10)	TCG	82.20	76.70	69.30	70.90	61.80	58.60	30.50	52.10
	SDT	75.60	84.40	92.80	103.40	111.40	120.90	123.80	139.80
	KW	2.75	3.09	3.42	3.99	4.38	4.93	5.16	6.13
55 (12.8)	TCG	95.20	87.70	88.40	74.60	75.40	53.90	46.10	60.30
	SDT	78.80	87.10	97.50	104.30	114.70	119.50	127.70	141.70
	KW	2.85	3.13	3.74	3.95	4.56	4.78	5.33	6.25

* AHRI listing applies only to systems shown in Combination Ratings table.

KW – Outdoor Unit Kilowatts Only.

SDT – Saturated Temperature Leaving Compressor (°F)

SST – Saturated Temperature Entering Compressor (°F/°C)

TCG – Gross Cooling Capacity (1000 Btuh)

GUIDE SPECIFICATIONS
GENERAL

System Description

Outdoor-mounted, air-cooled, split-system air conditioner unit suitable for ground or rooftop installation. Unit consists of a hermetic compressor, an air-cooled coil, propeller-type condenser fan, and a control box. Unit will discharge supply air horizontally as shown on contract drawings. Unit will be used in a refrigeration circuit to match up to a packaged fan coil or coil unit.

Quality Assurance

— Unit will be rated in accordance with the latest edition of AHRI Standard 210.

— Unit will be certified for capacity and efficiency, and listed in the latest AHRI directory.

— Unit construction will comply with latest edition of ANSI/ ASHRAE and with NEC.

— Unit will be constructed in accordance with UL standards and will carry the UL label of approval. Unit will have c-UL approval.

— Unit cabinet will be capable of withstanding Federal Test
Method Standard No. 141 (Method 6061) 500-hr salt spray test.

— Air-cooled condenser coils will be leak tested and pressure tested

— Unit constructed in ISO9001 approved facility.

Delivery, Storage, and Handling

— Unit will be shipped as single package only and is stored and handled per unit manufacturer's recommendations.

Warranty (for inclusion by specifying engineer)

— U.S. and Canada only.

PRODUCTS

Equipment

— Factory assembled, single piece, air-cooled air conditioner unit. Contained within the unit enclosure is all factory wiring, piping, controls, compressor, refrigerant charge Puron® (R-410A), and special features required prior to field start-up.

Unit Cabinet

— Unit cabinet will be constructed of galvanized steel, bonderized, and coated with a powder coat paint.

Fans

— Condenser fan will be direct-drive propeller type, discharging air horizontally.

— Condenser fan motors will be totally enclosed, 1-phase type with class B insulation and permanently lubricated bearings. Shafts will be corrosion resistant.

— Fan blades will be statically and dynamically balanced.

— Condenser fan openings will be equipped with coated steel wire safety guards.

Compressor

— Compressor will be hermetically sealed.

— Compressor will be mounted on rubber vibration isolators.

Condenser Coil

— Condenser coil will be air cooled.

— Coil will be constructed of aluminum fins mechanically bonded to copper tubes which are then cleaned, dehydrated, and sealed.

Refrigeration Components

— Refrigeration circuit components will include liquid-line front-seating shutoff valve with sweat connections, vapor-line front-seating shutoff valve with sweat connections, system charge of Puron® (R-410A) refrigerant, and compressor oil.

— Unit will be equipped with high-pressure switch, low pressure switch and filter drier for Puron refrigerant.

Operating Characteristics

— The capacity of the unit will meet or exceed _____ Btuh at a suction temperature of _____ °F/°C. The power consumption at full load will not exceed _____ kW.

— Combination of the unit and the evaporator or fan coil unit will have a total net cooling capacity of _____ Btuh or greater at conditions of _____ CFM entering air temperature at the evaporator at _____ °F/°C wet bulb and _____ °F/°C dry bulb, and air entering the unit at _____ °F/°C.

— The system will have a SEER of _____ Btuh/watt or greater at DOE conditions.

Electrical Requirements

— Nominal unit electrical characteristics will be _____ v, single phase, 60 hz. The unit will be capable of satisfactory operation within voltage limits of _____ v to _____ v.

— Nominal unit electrical characteristics will be _____ v, three phase, 60 hz. The unit will be capable of satisfactory operation within voltage limits of _____ v to _____ v.

— Unit electrical power will be single point connection.

— Control circuit will be 24v.

Special Features

— Refer to section of this literature identifying accessories and descriptions for specific features and available enhancements.

SYSTEM DESIGN SUMMARY

1. Intended for outdoor installation with free air inlet and outlet. Outdoor fan external static pressure available is less than 0.01-in. wc.
2. Minimum outdoor operating air temperature without low-ambient operation accessory is 55°F (12.8°C).
3. Maximum outdoor operating air temperature is 125°F (51.7°C).
4. For reliable operation, unit should be level in all horizontal planes.
5. For interconnecting refrigerant tube lengths greater than 80 ft (23.4 m) and/or 35 ft (10.7 m) vertical differential, consult Residential Piping and Longline Guideline and Service Manual available from equipment distributor.
6. If any refrigerant tubing is buried, provide a 6 in. (152.4 mm) vertical rise to the valve connections at the unit. Refrigerant tubing lengths up to 36 in. (914.4 mm) may be buried without further consideration. Do not bury refrigerant lines longer than 36 in. (914.4 mm).
7. Use only copper wire for electric connection at unit. Aluminum and clad aluminum are not acceptable for the type of connector provided.
8. Do not apply capillary tube indoor coils to these units.
9. Factory-supplied filter drier must be installed.

38HDR

Edition Date: 09/12

Catalog No: 38HDR−6PD

Replaces: 38HDR−3PD

ATTACHMENT 3

SoundPLAN Data – Construction Noise, Off-Site Receivers

		Level				Corrections		
Source name	Reference	Leq1	Leq2	Leq3	Lmax	Kwall	CI	CT
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Construction	Unit	117	-	-	-	-	-	-

4135.1 California Terraces PA-61
SoundPLAN Data - Construction

eceiver nan	Coordinates X	Y	Floor	Height	Limit Leq1	Level w/o NP Leq1
	in meter			m	dB(A)	dB(A)
1	499026.09	3603448.41	1.Fl	161.22	75	61.7
2	498937.19	3603453.17	1.Fl	161.82	75	62.4
3	498866.54	3603459.52	1.Fl	161.82	75	62.3
4	498523.64	3603467.46	1.Fl	163.05	75	53.2
5	498752.24	3603466.66	1.Fl	160.93	75	61.5
6	498637.94	3603469.84	1.Fl	159.12	75	56.8
7	498385.53	3603201.55	1.Fl	166.09	75	49.4
8	498467.29	3603103.92	1.Fl	166.09	75	50.1
9	498539.52	3603013.43	1.Fl	165.16	75	50.0
10	498597.46	3602976.92	1.Fl	165.09	75	50.1
11	498693.51	3602932.47	1.Fl	164.65	75	50.5
12	498829.24	3602895.16	1.Fl	161.07	60	50.5
13	499036.65	3603051.94	1.Fl	156.85	60	53.9
14	499157.13	3603114.14	1.Fl	157.61	60	53.8
15	499277.81	3603109.13	1.Fl	155.20	60	51.1
16	499488.68	3603344.20	1.Fl	154.14	60	48.1
17	499426.91	3603442.25	1.Fl	156.34	60	49.1
18	499314.22	3603443.76	1.Fl	156.95	60	51.5
19	499212.60	3603445.18	1.Fl	158.23	60	54.4
20	499096.07	3603451.40	1.Fl	159.90	60	58.8

ATTACHMENT 4

SoundPLAN Data – Construction Noise, On-Site Receivers

4135.1 California Terraces PA-61
SoundPLAN Data - Commercial Construction

		Level	Corrections		
Source name	Reference	Leq1	Kwall	CI	CT
		dB(A)	dB(A)	dB(A)	dB(A)
Construction	Unit	117	-	-	-

4135.1 California Terraces PA-61
SoundPLAN Data - Commercial Construction

No.	Coordinates X	Y	Floor	Height	Limit Leq1	Level w/o NP Leq1	Level w. NP Leq1	Difference Leq1	Conflict Leq1	Leq2	Leq3	Lmax
	in meter			m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)			
1	498828.790	3603274.670	1.Fl	162.860	-	74.0	0	-74.0	-	-	-	-
2	498828.790	3603299.800	1.Fl	163.450	-	74.2	0	-74.2	-	-	-	-
3	498828.640	3603323.030	1.Fl	163.270	-	74.1	0	-74.1	-	-	-	-
4	498829.580	3603379.600	1.Fl	162.590	-	70.9	0	-70.9	-	-	-	-
5	498830.370	3603397.300	1.Fl	162.610	-	70.0	0	-70.0	-	-	-	-

ATTACHMENT 5

SoundPLAN Data – Vehicle Traffic Noise

		Traffic values				Control	Constr.	Affect.		Gradient
Stationing	ADT	Vehicles type	Vehicle name	day	Speed	device	Speed	veh.	Road surface	Min / Max
km	Veh/24h			Veh/h	km/h		km/h	%		%
SR-905 WB	Traffic direction:	In entry direction								
0+000	135336	Total	-	5639	-	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Automobiles	-	4948	105	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Medium trucks	-	229	89	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Heavy trucks	-	350	89	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Buses	-	56	105	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Motorcycles	-	56	105	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-1.787878788
1+586	-					-	-	-	-	-
SR-905 EB	Traffic direction:	In entry direction								
0+000	135336	Total	-	5639	-	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Automobiles	-	4948	105	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Medium trucks	-	229	89	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Heavy trucks	-	350	89	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Buses	-	56	105	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Motorcycles	-	56	105	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-0.557377049
1+590	-					-	-	-	-	-
Otay Mesa Road WB	Traffic direction:	In entry direction								
0+000	66048	Total	-	2752	-	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Automobiles	-	2413	89	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Medium trucks	-	112	89	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Heavy trucks	-	171	89	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Buses	-	28	89	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Motorcycles	-	28	89	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-0.6
0+895	-					-	-	-	-	-
Otay Mesa Road EB	Traffic direction:	In entry direction								
0+000	66048	Total	-	2752	-	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Automobiles	-	2413	89	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Medium trucks	-	112	89	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Heavy trucks	-	171	89	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Buses	-	28	89	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Motorcycles	-	28	89	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+893	-					-	-	-	-	-
Caliente Avenue NB	Traffic direction:	In entry direction								
0+000	42024	Total	-	1751	-	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Automobiles	-	1535	48	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Medium trucks	-	71	48	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Heavy trucks	-	109	48	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Buses	-	18	48	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Motorcycles	-	18	48	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+783	-					-	-	-	-	-
Caliente Avenue SB	Traffic direction:	In entry direction								
0+000	42024	Total	-	1751	-	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Automobiles	-	1535	48	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Medium trucks	-	71	48	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Heavy trucks	-	109	48	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Buses	-	18	48	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Motorcycles	-	18	48	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+768	-					-	-	-	-	-
SR-905 WB Off-Ramp	Traffic direction:	In entry direction								
0+000	34536	Total	-	1439	-	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Automobiles	-	1263	48	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Medium trucks	-	59	48	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Heavy trucks	-	89	48	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Buses	-	14	48	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Motorcycles	-	14	48	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+638	-					-	-	-	-	-
SR-905 WB On-Ramp	Traffic direction:	In entry direction								
0+000	34536	Total	-	1439	-	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+000	34536	Automobiles	-	1263	48	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+000	34536	Medium trucks	-	59	48	none	-	-	Average (of DGAC and PCC)	-1.035714286

0+000	34536	Heavy trucks	-	89	48	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+000	34536	Buses	-	14	48	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+000	34536	Motorcycles	-	14	48	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+000	34536	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+464	-					-	-	-	-	-
SR-905 EB Off-Ramp		Traffic direction:	In entry direction							
0+000	34536	Total	-	1439	-	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Automobiles	-	1263	48	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Medium trucks	-	59	48	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Heavy trucks	-	89	48	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Buses	-	14	48	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Motorcycles	-	14	48	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-0.525
0+488	-					-	-	-	-	-
SR-905 EB On-Ramp		Traffic direction:	In entry direction							
0+000	34536	Total	-	1439	-	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Automobiles	-	1263	48	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Medium trucks	-	59	48	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Heavy trucks	-	89	48	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Buses	-	14	48	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Motorcycles	-	14	48	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-9
0+575	-					-	-	-	-	-

4135.1 California Terraces PA-61
SoundPLAN Data - Vehicle Traffic

No.	Coordinates X	Y	Floor	Height	Limit L(Aeq1h)	Level w/o NP L(Aeq1h)	Level w. NP L(Aeq1h)	Difference L(Aeq1h)	Conflict L(Aeq1h)
	in meter			m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
1	498,844.24	3,603,346.63	1.Fl	162.43	-	61.7	0	-61.7	-
1	498,844.24	3,603,346.63	2.Fl	165.73	-	64.4	0	-64.4	-
1	498,844.24	3,603,346.63	3.Fl	169.03	-	65.6	0	-65.6	-
2	498,829.30	3,603,389.73	1.Fl	162.58	-	68.1	0	-68.1	-
2	498,829.30	3,603,389.73	2.Fl	165.88	-	70.4	0	-70.4	-
2	498,829.30	3,603,389.73	3.Fl	169.18	-	71.4	0	-71.4	-
3	498,851.46	3,603,410.59	1.Fl	162.63	-	73.5	0	-73.5	-
3	498,851.46	3,603,410.59	2.Fl	165.93	-	75.2	0	-75.2	-
3	498,851.46	3,603,410.59	3.Fl	169.23	-	75.3	0	-75.3	-
4	498,898.04	3,603,407.08	1.Fl	162.85	-	73.2	0	-73.2	-
4	498,898.04	3,603,407.08	2.Fl	166.15	-	74.9	0	-74.9	-
4	498,898.04	3,603,407.08	3.Fl	169.45	-	75.1	0	-75.1	-
5	498,944.79	3,603,404.43	1.Fl	162.43	-	72.7	0	-72.7	-
5	498,944.79	3,603,404.43	2.Fl	165.73	-	74.4	0	-74.4	-
5	498,944.79	3,603,404.43	3.Fl	169.03	-	74.7	0	-74.7	-
6	498,992.26	3,603,402.60	1.Fl	161.90	-	72.8	0	-72.8	-
6	498,992.26	3,603,402.60	2.Fl	165.20	-	74.6	0	-74.6	-
6	498,992.26	3,603,402.60	3.Fl	168.50	-	74.8	0	-74.8	-
7	499,039.10	3,603,400.36	1.Fl	161.51	-	72.4	0	-72.4	-
7	499,039.10	3,603,400.36	2.Fl	164.81	-	74.3	0	-74.3	-
7	499,039.10	3,603,400.36	3.Fl	168.11	-	74.6	0	-74.6	-
8	499,061.97	3,603,384.54	1.Fl	161.49	-	68.9	0	-68.9	-
8	499,061.97	3,603,384.54	2.Fl	164.79	-	71.3	0	-71.3	-
8	499,061.97	3,603,384.54	3.Fl	168.09	-	72.1	0	-72.1	-
9	499,040.32	3,603,356.41	1.Fl	161.82	-	61.8	0	-61.8	-
9	499,040.32	3,603,356.41	2.Fl	165.12	-	64.5	0	-64.5	-
9	499,040.32	3,603,356.41	3.Fl	168.42	-	65.9	0	-65.9	-
10	498,985.48	3,603,356.23	1.Fl	162.37	-	57.0	0	-57.0	-
10	498,985.48	3,603,356.23	2.Fl	165.67	-	59.2	0	-59.2	-
10	498,985.48	3,603,356.23	3.Fl	168.97	-	60.9	0	-60.9	-
11	498,946.76	3,603,356.23	1.Fl	162.71	-	57.7	0	-57.7	-
11	498,946.76	3,603,356.23	2.Fl	166.01	-	59.6	0	-59.6	-
11	498,946.76	3,603,356.23	3.Fl	169.31	-	61.0	0	-61.0	-
12	498,896.76	3,603,356.40	1.Fl	162.89	-	58.5	0	-58.5	-
12	498,896.76	3,603,356.40	2.Fl	166.19	-	60.7	0	-60.7	-
12	498,896.76	3,603,356.40	3.Fl	169.49	-	61.9	0	-61.9	-
13	498,896.26	3,603,332.92	1.Fl	162.89	-	51.4	0	-51.4	-
13	498,896.26	3,603,332.92	2.Fl	166.19	-	52.6	0	-52.6	-
13	498,896.26	3,603,332.92	3.Fl	169.49	-	54.7	0	-54.7	-
14	498,923.31	3,603,333.50	1.Fl	162.81	-	56.7	0	-56.7	-
14	498,923.31	3,603,333.50	2.Fl	166.11	-	58.6	0	-58.6	-
14	498,923.31	3,603,333.50	3.Fl	169.41	-	59.6	0	-59.6	-
15	498,963.93	3,603,332.88	1.Fl	162.67	-	56.5	0	-56.5	-
15	498,963.93	3,603,332.88	2.Fl	165.97	-	58.6	0	-58.6	-
15	498,963.93	3,603,332.88	3.Fl	169.27	-	60.0	0	-60.0	-
16	499,017.68	3,603,332.87	1.Fl	162.01	-	58.3	0	-58.3	-
16	499,017.68	3,603,332.87	2.Fl	165.31	-	61.4	0	-61.4	-
16	499,017.68	3,603,332.87	3.Fl	168.61	-	62.9	0	-62.9	-
17	499,055.80	3,603,344.01	1.Fl	161.76	-	64.3	0	-64.3	-
17	499,055.80	3,603,344.01	2.Fl	165.06	-	67.8	0	-67.8	-
17	499,055.80	3,603,344.01	3.Fl	168.36	-	69.0	0	-69.0	-
18	499,067.98	3,603,321.48	1.Fl	161.73	-	63.8	0	-63.8	-
18	499,067.98	3,603,321.48	2.Fl	165.03	-	69.1	0	-69.1	-
18	499,067.98	3,603,321.48	3.Fl	168.33	-	70.2	0	-70.2	-
19	499,045.39	3,603,310.11	1.Fl	161.79	-	60.6	0	-60.6	-
19	499,045.39	3,603,310.11	2.Fl	165.09	-	64.4	0	-64.4	-
19	499,045.39	3,603,310.11	3.Fl	168.39	-	66.6	0	-66.6	-
20	498,987.81	3,603,309.44	1.Fl	162.40	-	60.1	0	-60.1	-
20	498,987.81	3,603,309.44	2.Fl	165.70	-	63.0	0	-63.0	-
20	498,987.81	3,603,309.44	3.Fl	169.00	-	64.1	0	-64.1	-

21	498,940.91	3,603,309.53	1.Fl	162.64	-	60.9	0	-60.9	-
21	498,940.91	3,603,309.53	2.Fl	165.94	-	63.1	0	-63.1	-
21	498,940.91	3,603,309.53	3.Fl	169.24	-	64.1	0	-64.1	-
22	498,892.89	3,603,309.93	1.Fl	162.89	-	61.4	0	-61.4	-
22	498,892.89	3,603,309.93	2.Fl	166.19	-	63.1	0	-63.1	-
22	498,892.89	3,603,309.93	3.Fl	169.49	-	64.1	0	-64.1	-
23	498,826.59	3,603,321.55	1.Fl	162.84	-	64.9	0	-64.9	-
23	498,826.59	3,603,321.55	2.Fl	166.14	-	67.9	0	-67.9	-
23	498,826.59	3,603,321.55	3.Fl	169.44	-	68.9	0	-68.9	-
24	498,826.56	3,603,286.70	1.Fl	162.79	-	66.4	0	-66.4	-
24	498,826.56	3,603,286.70	2.Fl	166.09	-	68.9	0	-68.9	-
24	498,826.56	3,603,286.70	3.Fl	169.39	-	69.8	0	-69.8	-
25	498,844.74	3,603,264.99	1.Fl	162.86	-	71.9	0	-71.9	-
25	498,844.74	3,603,264.99	2.Fl	166.16	-	73.7	0	-73.7	-
25	498,844.74	3,603,264.99	3.Fl	169.46	-	74.5	0	-74.5	-
26	498,892.74	3,603,266.42	1.Fl	162.58	-	70.4	0	-70.4	-
26	498,892.74	3,603,266.42	2.Fl	165.88	-	72.2	0	-72.2	-
26	498,892.74	3,603,266.42	3.Fl	169.18	-	73.0	0	-73.0	-
27	498,940.74	3,603,265.91	1.Fl	162.40	-	70.3	0	-70.3	-
27	498,940.74	3,603,265.91	2.Fl	165.70	-	72.7	0	-72.7	-
27	498,940.74	3,603,265.91	3.Fl	169.00	-	73.4	0	-73.4	-
28	498,987.60	3,603,265.49	1.Fl	162.36	-	70.9	0	-70.9	-
28	498,987.60	3,603,265.49	2.Fl	165.66	-	73.3	0	-73.3	-
28	498,987.60	3,603,265.49	3.Fl	168.96	-	73.9	0	-73.9	-
29	499,044.87	3,603,265.49	1.Fl	162.25	-	69.7	0	-69.7	-
29	499,044.87	3,603,265.49	2.Fl	165.55	-	74.0	0	-74.0	-
29	499,044.87	3,603,265.49	3.Fl	168.85	-	74.4	0	-74.4	-
30	499,068.47	3,603,284.18	1.Fl	162.36	-	67.0	0	-67.0	-
30	499,068.47	3,603,284.18	2.Fl	165.66	-	71.5	0	-71.5	-
30	499,068.47	3,603,284.18	3.Fl	168.96	-	72.1	0	-72.1	-
31	498,789.19	3,603,270.54	1.Fl	162.61	-	69.2	0	-69.2	-
31	498,789.19	3,603,270.54	2.Fl	165.91	-	71.6	0	-71.6	-
31	498,789.19	3,603,270.54	3.Fl	169.21	-	72.4	0	-72.4	-
32	498,709.23	3,603,298.99	1.Fl	162.03	-	67.9	0	-67.9	-
32	498,709.23	3,603,298.99	2.Fl	165.33	-	70.5	0	-70.5	-
32	498,709.23	3,603,298.99	3.Fl	168.63	-	71.5	0	-71.5	-
33	498,699.13	3,603,364.81	1.Fl	161.32	-	67.6	0	-67.6	-
33	498,699.13	3,603,364.81	2.Fl	164.62	-	70.0	0	-70.0	-
33	498,699.13	3,603,364.81	3.Fl	167.92	-	70.8	0	-70.8	-
34	498,707.88	3,603,407.91	1.Fl	161.22	-	71.2	0	-71.2	-
34	498,707.88	3,603,407.91	2.Fl	164.52	-	73.4	0	-73.4	-
34	498,707.88	3,603,407.91	3.Fl	167.82	-	73.9	0	-73.9	-
35	498,768.82	3,603,407.07	1.Fl	161.48	-	71.1	0	-71.1	-
35	498,768.82	3,603,407.07	2.Fl	164.78	-	73.3	0	-73.3	-
35	498,768.82	3,603,407.07	3.Fl	168.08	-	73.9	0	-73.9	-

Source name	Lane	Level w/o NP L(Aeq1h) dB(A)	Level w. NP L(Aeq1h) dB(A)
1 1.Fl 61.7	0.0		
Caliente Avenue NB		49.6	0
Caliente Avenue SB		49.0	0
Otay Mesa Road EB		56.0	0
Otay Mesa Road WB		54.3	0
SR-905 EB		53.9	0
SR-905 EB Off-Ramp		39.8	0
SR-905 EB On-Ramp		39.1	0
SR-905 WB		54.9	0
SR-905 WB Off-Ramp		46.5	0
SR-905 WB On-Ramp		43.0	0
1 2.Fl 64.4	0.0		
Caliente Avenue NB		51.2	0
Caliente Avenue SB		50.7	0
Otay Mesa Road EB		58.4	0
Otay Mesa Road WB		56.9	0
SR-905 EB		57.1	0
SR-905 EB Off-Ramp		41.3	0
SR-905 EB On-Ramp		40.7	0
SR-905 WB		58.1	0
SR-905 WB Off-Ramp		47.8	0
SR-905 WB On-Ramp		44.6	0
1 3.Fl 65.6	0.0		
Caliente Avenue NB		52.0	0
Caliente Avenue SB		51.5	0
Otay Mesa Road EB		59.4	0
Otay Mesa Road WB		57.9	0
SR-905 EB		58.7	0
SR-905 EB Off-Ramp		42.6	0
SR-905 EB On-Ramp		42.0	0
SR-905 WB		59.9	0
SR-905 WB Off-Ramp		48.7	0
SR-905 WB On-Ramp		45.5	0
2 1.Fl 68.1	0.0		
Caliente Avenue NB		52.5	0
Caliente Avenue SB		51.8	0
Otay Mesa Road EB		65.3	0
Otay Mesa Road WB		62.5	0
SR-905 EB		56.0	0
SR-905 EB Off-Ramp		41.7	0
SR-905 EB On-Ramp		41.3	0
SR-905 WB		57.1	0
SR-905 WB Off-Ramp		48.0	0
SR-905 WB On-Ramp		44.9	0
2 2.Fl 70.4	0.0		
Caliente Avenue NB		54.0	0
Caliente Avenue SB		53.3	0
Otay Mesa Road EB		67.4	0
Otay Mesa Road WB		64.5	0
SR-905 EB		59.7	0
SR-905 EB Off-Ramp		43.5	0
SR-905 EB On-Ramp		43.4	0

SR-905 WB				60.4	0
SR-905 WB Off-Ramp				49.6	0
SR-905 WB On-Ramp				46.3	0
2	3.Fl	71.4	0.0		
Caliente Avenue NB				54.6	0
Caliente Avenue SB				54.0	0
Otay Mesa Road EB				68.2	0
Otay Mesa Road WB				65.6	0
SR-905 EB				61.0	0
SR-905 EB Off-Ramp				44.7	0
SR-905 EB On-Ramp				44.4	0
SR-905 WB				62.0	0
SR-905 WB Off-Ramp				50.2	0
SR-905 WB On-Ramp				47.1	0
3	1.Fl	73.5	0.0		
Caliente Avenue NB				45.9	0
Caliente Avenue SB				45.4	0
Otay Mesa Road EB				72.3	0
Otay Mesa Road WB				67.0	0
SR-905 EB				40.0	0
SR-905 EB Off-Ramp				22.9	0
SR-905 EB On-Ramp				28.5	0
SR-905 WB				40.3	0
SR-905 WB Off-Ramp				29.3	0
SR-905 WB On-Ramp				24.4	0
3	2.Fl	75.2	0.0		
Caliente Avenue NB				47.6	0
Caliente Avenue SB				46.9	0
Otay Mesa Road EB				73.9	0
Otay Mesa Road WB				69.1	0
SR-905 EB				42.2	0
SR-905 EB Off-Ramp				27.1	0
SR-905 EB On-Ramp				29.1	0
SR-905 WB				42.5	0
SR-905 WB Off-Ramp				31.1	0
SR-905 WB On-Ramp				28.3	0
3	3.Fl	75.3	0.0		
Caliente Avenue NB				48.3	0
Caliente Avenue SB				47.8	0
Otay Mesa Road EB				73.8	0
Otay Mesa Road WB				69.8	0
SR-905 EB				46.5	0
SR-905 EB Off-Ramp				32.4	0
SR-905 EB On-Ramp				32.2	0
SR-905 WB				46.8	0
SR-905 WB Off-Ramp				34.6	0
SR-905 WB On-Ramp				33.9	0
4	1.Fl	73.2	0.0		
Caliente Avenue NB				43.3	0
Caliente Avenue SB				42.7	0
Otay Mesa Road EB				72.0	0
Otay Mesa Road WB				66.7	0
SR-905 EB				39.8	0
SR-905 EB Off-Ramp				20.4	0
SR-905 EB On-Ramp				28.6	0

SR-905 WB				40.1	0
SR-905 WB Off-Ramp				27.9	0
SR-905 WB On-Ramp				22.9	0
4	2.Fl	74.9	0.0		
Caliente Avenue NB				45.2	0
Caliente Avenue SB				44.6	0
Otay Mesa Road EB				73.7	0
Otay Mesa Road WB				68.9	0
SR-905 EB				41.2	0
SR-905 EB Off-Ramp				24.2	0
SR-905 EB On-Ramp				28.7	0
SR-905 WB				41.4	0
SR-905 WB Off-Ramp				29.8	0
SR-905 WB On-Ramp				25.6	0
4	3.Fl	75.1	0.0		
Caliente Avenue NB				46.2	0
Caliente Avenue SB				45.6	0
Otay Mesa Road EB				73.7	0
Otay Mesa Road WB				69.7	0
SR-905 EB				45.1	0
SR-905 EB Off-Ramp				29.7	0
SR-905 EB On-Ramp				31.5	0
SR-905 WB				45.4	0
SR-905 WB Off-Ramp				33.1	0
SR-905 WB On-Ramp				31.8	0
5	1.Fl	72.7	0.0		
Caliente Avenue NB				41.3	0
Caliente Avenue SB				40.8	0
Otay Mesa Road EB				71.5	0
Otay Mesa Road WB				66.4	0
SR-905 EB				39.7	0
SR-905 EB Off-Ramp				19.7	0
SR-905 EB On-Ramp				28.4	0
SR-905 WB				39.9	0
SR-905 WB Off-Ramp				27.8	0
SR-905 WB On-Ramp				20.7	0
5	2.Fl	74.4	0.0		
Caliente Avenue NB				43.4	0
Caliente Avenue SB				42.8	0
Otay Mesa Road EB				73.1	0
Otay Mesa Road WB				68.5	0
SR-905 EB				41.5	0
SR-905 EB Off-Ramp				24.5	0
SR-905 EB On-Ramp				28.5	0
SR-905 WB				41.8	0
SR-905 WB Off-Ramp				29.7	0
SR-905 WB On-Ramp				25.5	0
5	3.Fl	74.7	0.0		
Caliente Avenue NB				44.5	0
Caliente Avenue SB				44.0	0
Otay Mesa Road EB				73.2	0
Otay Mesa Road WB				69.3	0
SR-905 EB				44.7	0
SR-905 EB Off-Ramp				27.0	0
SR-905 EB On-Ramp				31.5	0

SR-905 WB				45.0	0
SR-905 WB Off-Ramp				32.9	0
SR-905 WB On-Ramp				27.7	0
6	1.Fl	72.8	0.0		
Caliente Avenue NB				39.8	0
Caliente Avenue SB				39.6	0
Otay Mesa Road EB				71.6	0
Otay Mesa Road WB				66.5	0
SR-905 EB				39.9	0
SR-905 EB Off-Ramp				17.2	0
SR-905 EB On-Ramp				28.7	0
SR-905 WB				40.2	0
SR-905 WB Off-Ramp				28.7	0
SR-905 WB On-Ramp				19.0	0
6	2.Fl	74.6	0.0		
Caliente Avenue NB				42.0	0
Caliente Avenue SB				41.4	0
Otay Mesa Road EB				73.2	0
Otay Mesa Road WB				68.7	0
SR-905 EB				41.9	0
SR-905 EB Off-Ramp				21.3	0
SR-905 EB On-Ramp				29.0	0
SR-905 WB				42.4	0
SR-905 WB Off-Ramp				30.5	0
SR-905 WB On-Ramp				22.8	0
6	3.Fl	74.8	0.0		
Caliente Avenue NB				43.2	0
Caliente Avenue SB				42.6	0
Otay Mesa Road EB				73.3	0
Otay Mesa Road WB				69.5	0
SR-905 EB				45.1	0
SR-905 EB Off-Ramp				25.7	0
SR-905 EB On-Ramp				31.5	0
SR-905 WB				45.6	0
SR-905 WB Off-Ramp				33.5	0
SR-905 WB On-Ramp				27.3	0
7	1.Fl	72.4	0.0		
Caliente Avenue NB				38.0	0
Caliente Avenue SB				37.8	0
Otay Mesa Road EB				71.1	0
Otay Mesa Road WB				66.5	0
SR-905 EB				40.5	0
SR-905 EB Off-Ramp				15.5	0
SR-905 EB On-Ramp				29.0	0
SR-905 WB				40.8	0
SR-905 WB Off-Ramp				29.7	0
SR-905 WB On-Ramp				17.6	0
7	2.Fl	74.3	0.0		
Caliente Avenue NB				40.8	0
Caliente Avenue SB				40.0	0
Otay Mesa Road EB				72.9	0
Otay Mesa Road WB				68.6	0
SR-905 EB				42.7	0
SR-905 EB Off-Ramp				21.2	0
SR-905 EB On-Ramp				29.6	0

SR-905 WB				43.6	0
SR-905 WB Off-Ramp				31.6	0
SR-905 WB On-Ramp				22.8	0
7	3.Fl	74.6	0.0		
Caliente Avenue NB				42.0	0
Caliente Avenue SB				41.2	0
Otay Mesa Road EB				73.0	0
Otay Mesa Road WB				69.4	0
SR-905 EB				45.9	0
SR-905 EB Off-Ramp				24.3	0
SR-905 EB On-Ramp				32.1	0
SR-905 WB				46.4	0
SR-905 WB Off-Ramp				34.5	0
SR-905 WB On-Ramp				25.5	0
8	1.Fl	68.9	0.0		
Caliente Avenue NB				23.6	0
Caliente Avenue SB				21.8	0
Otay Mesa Road EB				66.5	0
Otay Mesa Road WB				63.7	0
SR-905 EB				56.0	0
SR-905 EB Off-Ramp				13.0	0
SR-905 EB On-Ramp				42.3	0
SR-905 WB				57.3	0
SR-905 WB Off-Ramp				46.5	0
SR-905 WB On-Ramp				13.2	0
8	2.Fl	71.3	0.0		
Caliente Avenue NB				29.7	0
Caliente Avenue SB				28.1	0
Otay Mesa Road EB				68.8	0
Otay Mesa Road WB				65.8	0
SR-905 EB				59.3	0
SR-905 EB Off-Ramp				19.9	0
SR-905 EB On-Ramp				44.4	0
SR-905 WB				60.3	0
SR-905 WB Off-Ramp				48.1	0
SR-905 WB On-Ramp				20.0	0
8	3.Fl	72.1	0.0		
Caliente Avenue NB				31.6	0
Caliente Avenue SB				30.1	0
Otay Mesa Road EB				69.2	0
Otay Mesa Road WB				66.8	0
SR-905 EB				61.1	0
SR-905 EB Off-Ramp				23.9	0
SR-905 EB On-Ramp				45.7	0
SR-905 WB				61.9	0
SR-905 WB Off-Ramp				49.4	0
SR-905 WB On-Ramp				23.8	0
9	1.Fl	61.8	0.0		
Caliente Avenue NB				34.1	0
Caliente Avenue SB				33.6	0
Otay Mesa Road EB				58.8	0
Otay Mesa Road WB				56.9	0
SR-905 EB				49.9	0
SR-905 EB Off-Ramp				25.9	0
SR-905 EB On-Ramp				35.5	0

SR-905 WB				51.2	0
SR-905 WB Off-Ramp				39.8	0
SR-905 WB On-Ramp				31.0	0
9	2.Fl	64.5	0.0		
Caliente Avenue NB				35.4	0
Caliente Avenue SB				34.9	0
Otay Mesa Road EB				61.4	0
Otay Mesa Road WB				59.5	0
SR-905 EB				53.5	0
SR-905 EB Off-Ramp				26.6	0
SR-905 EB On-Ramp				37.4	0
SR-905 WB				54.6	0
SR-905 WB Off-Ramp				42.1	0
SR-905 WB On-Ramp				32.7	0
9	3.Fl	65.9	0.0		
Caliente Avenue NB				36.9	0
Caliente Avenue SB				36.6	0
Otay Mesa Road EB				62.4	0
Otay Mesa Road WB				60.6	0
SR-905 EB				56.1	0
SR-905 EB Off-Ramp				28.2	0
SR-905 EB On-Ramp				40.1	0
SR-905 WB				57.1	0
SR-905 WB Off-Ramp				44.0	0
SR-905 WB On-Ramp				33.9	0
10	1.Fl	57.0	0.0		
Caliente Avenue NB				37.4	0
Caliente Avenue SB				36.8	0
Otay Mesa Road EB				53.7	0
Otay Mesa Road WB				52.0	0
SR-905 EB				46.1	0
SR-905 EB Off-Ramp				29.9	0
SR-905 EB On-Ramp				29.7	0
SR-905 WB				47.3	0
SR-905 WB Off-Ramp				31.0	0
SR-905 WB On-Ramp				34.6	0
10	2.Fl	59.2	0.0		
Caliente Avenue NB				38.5	0
Caliente Avenue SB				38.0	0
Otay Mesa Road EB				55.9	0
Otay Mesa Road WB				53.9	0
SR-905 EB				48.4	0
SR-905 EB Off-Ramp				30.7	0
SR-905 EB On-Ramp				30.8	0
SR-905 WB				50.2	0
SR-905 WB Off-Ramp				32.8	0
SR-905 WB On-Ramp				36.2	0
10	3.Fl	60.9	0.0		
Caliente Avenue NB				40.3	0
Caliente Avenue SB				39.7	0
Otay Mesa Road EB				57.3	0
Otay Mesa Road WB				55.4	0
SR-905 EB				50.8	0
SR-905 EB Off-Ramp				32.2	0
SR-905 EB On-Ramp				34.1	0

SR-905 WB				52.4	0
SR-905 WB Off-Ramp				34.8	0
SR-905 WB On-Ramp				37.5	0
11	1.Fl	57.7	0.0		
Caliente Avenue NB				40.1	0
Caliente Avenue SB				39.5	0
Otay Mesa Road EB				54.4	0
Otay Mesa Road WB				52.7	0
SR-905 EB				46.4	0
SR-905 EB Off-Ramp				32.5	0
SR-905 EB On-Ramp				30.3	0
SR-905 WB				47.4	0
SR-905 WB Off-Ramp				34.6	0
SR-905 WB On-Ramp				36.2	0
11	2.Fl	59.6	0.0		
Caliente Avenue NB				41.6	0
Caliente Avenue SB				41.0	0
Otay Mesa Road EB				56.1	0
Otay Mesa Road WB				54.4	0
SR-905 EB				49.0	0
SR-905 EB Off-Ramp				34.1	0
SR-905 EB On-Ramp				31.8	0
SR-905 WB				50.2	0
SR-905 WB Off-Ramp				36.5	0
SR-905 WB On-Ramp				38.0	0
11	3.Fl	61.0	0.0		
Caliente Avenue NB				43.1	0
Caliente Avenue SB				42.4	0
Otay Mesa Road EB				57.5	0
Otay Mesa Road WB				55.7	0
SR-905 EB				50.7	0
SR-905 EB Off-Ramp				35.5	0
SR-905 EB On-Ramp				32.4	0
SR-905 WB				52.0	0
SR-905 WB Off-Ramp				37.2	0
SR-905 WB On-Ramp				39.1	0
12	1.Fl	58.5	0.0		
Caliente Avenue NB				44.1	0
Caliente Avenue SB				43.6	0
Otay Mesa Road EB				54.1	0
Otay Mesa Road WB				52.4	0
SR-905 EB				49.6	0
SR-905 EB Off-Ramp				36.8	0
SR-905 EB On-Ramp				30.2	0
SR-905 WB				50.7	0
SR-905 WB Off-Ramp				38.3	0
SR-905 WB On-Ramp				41.1	0
12	2.Fl	60.7	0.0		
Caliente Avenue NB				45.6	0
Caliente Avenue SB				45.2	0
Otay Mesa Road EB				55.7	0
Otay Mesa Road WB				54.2	0
SR-905 EB				52.6	0
SR-905 EB Off-Ramp				38.6	0
SR-905 EB On-Ramp				32.3	0

SR-905 WB				54.0	0
SR-905 WB Off-Ramp				40.1	0
SR-905 WB On-Ramp				42.7	0
12	3.Fl	61.9	0.0		
Caliente Avenue NB				46.5	0
Caliente Avenue SB				46.0	0
Otay Mesa Road EB				56.9	0
Otay Mesa Road WB				55.3	0
SR-905 EB				54.1	0
SR-905 EB Off-Ramp				40.0	0
SR-905 EB On-Ramp				32.5	0
SR-905 WB				55.4	0
SR-905 WB Off-Ramp				40.6	0
SR-905 WB On-Ramp				43.7	0
13	1.Fl	51.4	0.0		
Caliente Avenue NB				42.4	0
Caliente Avenue SB				41.9	0
Otay Mesa Road EB				39.8	0
Otay Mesa Road WB				39.2	0
SR-905 EB				44.2	0
SR-905 EB Off-Ramp				30.0	0
SR-905 EB On-Ramp				29.3	0
SR-905 WB				47.4	0
SR-905 WB Off-Ramp				31.9	0
SR-905 WB On-Ramp				36.4	0
13	2.Fl	52.6	0.0		
Caliente Avenue NB				43.7	0
Caliente Avenue SB				43.2	0
Otay Mesa Road EB				42.3	0
Otay Mesa Road WB				42.0	0
SR-905 EB				45.5	0
SR-905 EB Off-Ramp				31.2	0
SR-905 EB On-Ramp				32.8	0
SR-905 WB				47.7	0
SR-905 WB Off-Ramp				34.3	0
SR-905 WB On-Ramp				35.3	0
13	3.Fl	54.7	0.0		
Caliente Avenue NB				44.6	0
Caliente Avenue SB				44.2	0
Otay Mesa Road EB				43.9	0
Otay Mesa Road WB				43.8	0
SR-905 EB				48.7	0
SR-905 EB Off-Ramp				32.6	0
SR-905 EB On-Ramp				35.6	0
SR-905 WB				50.2	0
SR-905 WB Off-Ramp				36.8	0
SR-905 WB On-Ramp				37.3	0
14	1.Fl	56.7	0.0		
Caliente Avenue NB				38.5	0
Caliente Avenue SB				37.9	0
Otay Mesa Road EB				50.3	0
Otay Mesa Road WB				49.2	0
SR-905 EB				49.8	0
SR-905 EB Off-Ramp				30.9	0
SR-905 EB On-Ramp				36.9	0

SR-905 WB				51.6	0
SR-905 WB Off-Ramp				41.4	0
SR-905 WB On-Ramp				36.7	0
14	2.Fl	58.6	0.0		
Caliente Avenue NB				39.5	0
Caliente Avenue SB				38.9	0
Otay Mesa Road EB				52.5	0
Otay Mesa Road WB				51.3	0
SR-905 EB				51.8	0
SR-905 EB Off-Ramp				31.7	0
SR-905 EB On-Ramp				38.3	0
SR-905 WB				53.4	0
SR-905 WB Off-Ramp				42.7	0
SR-905 WB On-Ramp				36.0	0
14	3.Fl	59.6	0.0		
Caliente Avenue NB				40.8	0
Caliente Avenue SB				40.2	0
Otay Mesa Road EB				53.4	0
Otay Mesa Road WB				52.3	0
SR-905 EB				52.9	0
SR-905 EB Off-Ramp				34.0	0
SR-905 EB On-Ramp				39.3	0
SR-905 WB				54.4	0
SR-905 WB Off-Ramp				43.2	0
SR-905 WB On-Ramp				37.5	0
15	1.Fl	56.5	0.0		
Caliente Avenue NB				35.5	0
Caliente Avenue SB				35.0	0
Otay Mesa Road EB				49.1	0
Otay Mesa Road WB				47.9	0
SR-905 EB				50.1	0
SR-905 EB Off-Ramp				29.9	0
SR-905 EB On-Ramp				37.9	0
SR-905 WB				52.5	0
SR-905 WB Off-Ramp				40.7	0
SR-905 WB On-Ramp				33.7	0
15	2.Fl	58.6	0.0		
Caliente Avenue NB				36.3	0
Caliente Avenue SB				35.5	0
Otay Mesa Road EB				51.1	0
Otay Mesa Road WB				50.0	0
SR-905 EB				52.8	0
SR-905 EB Off-Ramp				31.6	0
SR-905 EB On-Ramp				39.7	0
SR-905 WB				54.3	0
SR-905 WB Off-Ramp				42.8	0
SR-905 WB On-Ramp				33.7	0
15	3.Fl	60.0	0.0		
Caliente Avenue NB				38.2	0
Caliente Avenue SB				37.2	0
Otay Mesa Road EB				52.1	0
Otay Mesa Road WB				51.1	0
SR-905 EB				54.3	0
SR-905 EB Off-Ramp				33.3	0
SR-905 EB On-Ramp				41.1	0

SR-905 WB				55.7	0
SR-905 WB Off-Ramp				44.5	0
SR-905 WB On-Ramp				34.9	0
16	1.Fl	58.3	0.0		
Caliente Avenue NB				34.1	0
Caliente Avenue SB				33.6	0
Otay Mesa Road EB				49.9	0
Otay Mesa Road WB				48.7	0
SR-905 EB				52.4	0
SR-905 EB Off-Ramp				28.5	0
SR-905 EB On-Ramp				40.8	0
SR-905 WB				54.4	0
SR-905 WB Off-Ramp				43.8	0
SR-905 WB On-Ramp				34.2	0
16	2.Fl	61.4	0.0		
Caliente Avenue NB				33.4	0
Caliente Avenue SB				32.7	0
Otay Mesa Road EB				51.8	0
Otay Mesa Road WB				50.6	0
SR-905 EB				56.5	0
SR-905 EB Off-Ramp				27.3	0
SR-905 EB On-Ramp				43.2	0
SR-905 WB				57.9	0
SR-905 WB Off-Ramp				45.9	0
SR-905 WB On-Ramp				32.8	0
16	3.Fl	62.9	0.0		
Caliente Avenue NB				34.6	0
Caliente Avenue SB				34.0	0
Otay Mesa Road EB				53.3	0
Otay Mesa Road WB				52.1	0
SR-905 EB				58.0	0
SR-905 EB Off-Ramp				28.9	0
SR-905 EB On-Ramp				44.3	0
SR-905 WB				59.3	0
SR-905 WB Off-Ramp				47.5	0
SR-905 WB On-Ramp				32.8	0
17	1.Fl	64.3	0.0		
Caliente Avenue NB				20.0	0
Caliente Avenue SB				18.6	0
Otay Mesa Road EB				61.0	0
Otay Mesa Road WB				59.2	0
SR-905 EB				54.1	0
SR-905 EB Off-Ramp				12.4	0
SR-905 EB On-Ramp				37.6	0
SR-905 WB				55.3	0
SR-905 WB Off-Ramp				44.1	0
SR-905 WB On-Ramp				13.9	0
17	2.Fl	67.8	0.0		
Caliente Avenue NB				25.8	0
Caliente Avenue SB				24.6	0
Otay Mesa Road EB				63.5	0
Otay Mesa Road WB				62.2	0
SR-905 EB				59.3	0
SR-905 EB Off-Ramp				18.5	0
SR-905 EB On-Ramp				40.3	0

SR-905 WB				60.7	0
SR-905 WB Off-Ramp				47.8	0
SR-905 WB On-Ramp				20.0	0
17	3.Fl	69.0	0.0		
Caliente Avenue NB				30.9	0
Caliente Avenue SB				29.8	0
Otay Mesa Road EB				64.4	0
Otay Mesa Road WB				63.1	0
SR-905 EB				61.1	0
SR-905 EB Off-Ramp				24.4	0
SR-905 EB On-Ramp				42.2	0
SR-905 WB				62.2	0
SR-905 WB Off-Ramp				49.2	0
SR-905 WB On-Ramp				25.5	0
18	1.Fl	63.8	0.0		
Caliente Avenue NB				21.0	0
Caliente Avenue SB				18.9	0
Otay Mesa Road EB				56.7	0
Otay Mesa Road WB				55.4	0
SR-905 EB				57.9	0
SR-905 EB Off-Ramp				14.1	0
SR-905 EB On-Ramp				45.0	0
SR-905 WB				59.5	0
SR-905 WB Off-Ramp				49.1	0
SR-905 WB On-Ramp				14.3	0
18	2.Fl	69.1	0.0		
Caliente Avenue NB				26.9	0
Caliente Avenue SB				25.2	0
Otay Mesa Road EB				62.0	0
Otay Mesa Road WB				60.8	0
SR-905 EB				63.4	0
SR-905 EB Off-Ramp				20.6	0
SR-905 EB On-Ramp				47.9	0
SR-905 WB				64.4	0
SR-905 WB Off-Ramp				52.7	0
SR-905 WB On-Ramp				20.6	0
18	3.Fl	70.2	0.0		
Caliente Avenue NB				31.1	0
Caliente Avenue SB				29.7	0
Otay Mesa Road EB				62.9	0
Otay Mesa Road WB				61.7	0
SR-905 EB				64.8	0
SR-905 EB Off-Ramp				25.5	0
SR-905 EB On-Ramp				48.9	0
SR-905 WB				65.7	0
SR-905 WB Off-Ramp				53.5	0
SR-905 WB On-Ramp				25.6	0
19	1.Fl	60.6	0.0		
Caliente Avenue NB				32.7	0
Caliente Avenue SB				32.4	0
Otay Mesa Road EB				45.7	0
Otay Mesa Road WB				44.4	0
SR-905 EB				55.7	0
SR-905 EB Off-Ramp				28.7	0
SR-905 EB On-Ramp				42.0	0

SR-905 WB				58.0	0
SR-905 WB Off-Ramp				47.1	0
SR-905 WB On-Ramp				34.6	0
19	2.Fl	64.4	0.0		
Caliente Avenue NB				32.8	0
Caliente Avenue SB				31.8	0
Otay Mesa Road EB				51.1	0
Otay Mesa Road WB				49.5	0
SR-905 EB				60.0	0
SR-905 EB Off-Ramp				27.1	0
SR-905 EB On-Ramp				44.8	0
SR-905 WB				61.5	0
SR-905 WB Off-Ramp				49.4	0
SR-905 WB On-Ramp				32.6	0
19	3.Fl	66.6	0.0		
Caliente Avenue NB				34.0	0
Caliente Avenue SB				32.8	0
Otay Mesa Road EB				52.8	0
Otay Mesa Road WB				51.2	0
SR-905 EB				62.3	0
SR-905 EB Off-Ramp				28.3	0
SR-905 EB On-Ramp				47.0	0
SR-905 WB				63.8	0
SR-905 WB Off-Ramp				51.5	0
SR-905 WB On-Ramp				33.3	0
20	1.Fl	60.1	0.0		
Caliente Avenue NB				35.2	0
Caliente Avenue SB				34.3	0
Otay Mesa Road EB				36.4	0
Otay Mesa Road WB				36.3	0
SR-905 EB				55.4	0
SR-905 EB Off-Ramp				30.9	0
SR-905 EB On-Ramp				43.3	0
SR-905 WB				57.6	0
SR-905 WB Off-Ramp				47.1	0
SR-905 WB On-Ramp				34.0	0
20	2.Fl	63.0	0.0		
Caliente Avenue NB				35.4	0
Caliente Avenue SB				34.5	0
Otay Mesa Road EB				38.5	0
Otay Mesa Road WB				38.6	0
SR-905 EB				58.7	0
SR-905 EB Off-Ramp				29.9	0
SR-905 EB On-Ramp				45.2	0
SR-905 WB				60.4	0
SR-905 WB Off-Ramp				49.5	0
SR-905 WB On-Ramp				35.0	0
20	3.Fl	64.1	0.0		
Caliente Avenue NB				37.1	0
Caliente Avenue SB				35.9	0
Otay Mesa Road EB				41.1	0
Otay Mesa Road WB				41.3	0
SR-905 EB				59.8	0
SR-905 EB Off-Ramp				31.9	0
SR-905 EB On-Ramp				46.3	0

SR-905 WB				61.4	0
SR-905 WB Off-Ramp				50.6	0
SR-905 WB On-Ramp				35.6	0
21	1.Fl	60.9	0.0		
Caliente Avenue NB				36.9	0
Caliente Avenue SB				36.3	0
Otay Mesa Road EB				36.6	0
Otay Mesa Road WB				36.4	0
SR-905 EB				56.7	0
SR-905 EB Off-Ramp				31.6	0
SR-905 EB On-Ramp				44.5	0
SR-905 WB				58.1	0
SR-905 WB Off-Ramp				48.0	0
SR-905 WB On-Ramp				36.7	0
21	2.Fl	63.1	0.0		
Caliente Avenue NB				37.2	0
Caliente Avenue SB				36.4	0
Otay Mesa Road EB				37.3	0
Otay Mesa Road WB				37.6	0
SR-905 EB				58.8	0
SR-905 EB Off-Ramp				30.6	0
SR-905 EB On-Ramp				45.8	0
SR-905 WB				60.5	0
SR-905 WB Off-Ramp				50.1	0
SR-905 WB On-Ramp				36.7	0
21	3.Fl	64.1	0.0		
Caliente Avenue NB				39.2	0
Caliente Avenue SB				38.4	0
Otay Mesa Road EB				40.5	0
Otay Mesa Road WB				40.4	0
SR-905 EB				59.9	0
SR-905 EB Off-Ramp				33.7	0
SR-905 EB On-Ramp				46.8	0
SR-905 WB				61.5	0
SR-905 WB Off-Ramp				50.9	0
SR-905 WB On-Ramp				37.5	0
22	1.Fl	61.4	0.0		
Caliente Avenue NB				39.1	0
Caliente Avenue SB				38.6	0
Otay Mesa Road EB				35.2	0
Otay Mesa Road WB				34.9	0
SR-905 EB				56.4	0
SR-905 EB Off-Ramp				34.0	0
SR-905 EB On-Ramp				43.5	0
SR-905 WB				59.0	0
SR-905 WB Off-Ramp				50.1	0
SR-905 WB On-Ramp				39.0	0
22	2.Fl	63.1	0.0		
Caliente Avenue NB				40.4	0
Caliente Avenue SB				39.8	0
Otay Mesa Road EB				37.0	0
Otay Mesa Road WB				36.9	0
SR-905 EB				58.8	0
SR-905 EB Off-Ramp				33.1	0
SR-905 EB On-Ramp				45.0	0

SR-905 WB				60.4	0
SR-905 WB Off-Ramp				50.8	0
SR-905 WB On-Ramp				40.2	0
22	3.Fl	64.1	0.0		
Caliente Avenue NB				42.0	0
Caliente Avenue SB				41.3	0
Otay Mesa Road EB				39.6	0
Otay Mesa Road WB				39.9	0
SR-905 EB				59.8	0
SR-905 EB Off-Ramp				36.5	0
SR-905 EB On-Ramp				45.9	0
SR-905 WB				61.4	0
SR-905 WB Off-Ramp				51.1	0
SR-905 WB On-Ramp				41.2	0
23	1.Fl	64.9	0.0		
Caliente Avenue NB				52.3	0
Caliente Avenue SB				51.4	0
Otay Mesa Road EB				56.1	0
Otay Mesa Road WB				54.6	0
SR-905 EB				58.8	0
SR-905 EB Off-Ramp				42.7	0
SR-905 EB On-Ramp				44.8	0
SR-905 WB				60.1	0
SR-905 WB Off-Ramp				52.9	0
SR-905 WB On-Ramp				45.4	0
23	2.Fl	67.9	0.0		
Caliente Avenue NB				53.7	0
Caliente Avenue SB				53.0	0
Otay Mesa Road EB				58.7	0
Otay Mesa Road WB				57.3	0
SR-905 EB				62.1	0
SR-905 EB Off-Ramp				44.5	0
SR-905 EB On-Ramp				46.5	0
SR-905 WB				63.8	0
SR-905 WB Off-Ramp				54.2	0
SR-905 WB On-Ramp				46.8	0
23	3.Fl	68.9	0.0		
Caliente Avenue NB				54.4	0
Caliente Avenue SB				53.7	0
Otay Mesa Road EB				59.6	0
Otay Mesa Road WB				58.2	0
SR-905 EB				63.3	0
SR-905 EB Off-Ramp				45.7	0
SR-905 EB On-Ramp				47.3	0
SR-905 WB				64.8	0
SR-905 WB Off-Ramp				54.9	0
SR-905 WB On-Ramp				47.6	0
24	1.Fl	66.4	0.0		
Caliente Avenue NB				50.1	0
Caliente Avenue SB				49.3	0
Otay Mesa Road EB				53.0	0
Otay Mesa Road WB				51.9	0
SR-905 EB				61.0	0
SR-905 EB Off-Ramp				40.9	0
SR-905 EB On-Ramp				47.7	0

SR-905 WB				63.0	0
SR-905 WB Off-Ramp				56.6	0
SR-905 WB On-Ramp				43.9	0
24	2.Fl	68.9	0.0		
Caliente Avenue NB				51.7	0
Caliente Avenue SB				50.8	0
Otay Mesa Road EB				55.9	0
Otay Mesa Road WB				55.0	0
SR-905 EB				63.8	0
SR-905 EB Off-Ramp				42.7	0
SR-905 EB On-Ramp				49.1	0
SR-905 WB				65.6	0
SR-905 WB Off-Ramp				57.6	0
SR-905 WB On-Ramp				45.2	0
24	3.Fl	69.8	0.0		
Caliente Avenue NB				52.4	0
Caliente Avenue SB				51.6	0
Otay Mesa Road EB				56.7	0
Otay Mesa Road WB				55.9	0
SR-905 EB				64.8	0
SR-905 EB Off-Ramp				44.0	0
SR-905 EB On-Ramp				49.8	0
SR-905 WB				66.6	0
SR-905 WB Off-Ramp				58.0	0
SR-905 WB On-Ramp				46.1	0
25	1.Fl	71.9	0.0		
Caliente Avenue NB				47.8	0
Caliente Avenue SB				46.7	0
Otay Mesa Road EB				28.9	0
Otay Mesa Road WB				28.6	0
SR-905 EB				66.6	0
SR-905 EB Off-Ramp				42.2	0
SR-905 EB On-Ramp				53.0	0
SR-905 WB				69.4	0
SR-905 WB Off-Ramp				62.8	0
SR-905 WB On-Ramp				42.2	0
25	2.Fl	73.7	0.0		
Caliente Avenue NB				49.2	0
Caliente Avenue SB				48.2	0
Otay Mesa Road EB				33.6	0
Otay Mesa Road WB				33.5	0
SR-905 EB				68.9	0
SR-905 EB Off-Ramp				43.9	0
SR-905 EB On-Ramp				54.2	0
SR-905 WB				71.1	0
SR-905 WB Off-Ramp				63.7	0
SR-905 WB On-Ramp				43.5	0
25	3.Fl	74.5	0.0		
Caliente Avenue NB				49.8	0
Caliente Avenue SB				49.0	0
Otay Mesa Road EB				37.8	0
Otay Mesa Road WB				37.8	0
SR-905 EB				69.7	0
SR-905 EB Off-Ramp				45.0	0
SR-905 EB On-Ramp				54.8	0

SR-905 WB				72.0	0
SR-905 WB Off-Ramp				63.6	0
SR-905 WB On-Ramp				44.5	0
26	1.Fl	70.4	0.0		
Caliente Avenue NB				45.1	0
Caliente Avenue SB				44.4	0
Otay Mesa Road EB				34.0	0
Otay Mesa Road WB				34.7	0
SR-905 EB				65.3	0
SR-905 EB Off-Ramp				41.0	0
SR-905 EB On-Ramp				51.5	0
SR-905 WB				68.0	0
SR-905 WB Off-Ramp				60.6	0
SR-905 WB On-Ramp				27.7	0
26	2.Fl	72.2	0.0		
Caliente Avenue NB				46.6	0
Caliente Avenue SB				45.7	0
Otay Mesa Road EB				35.3	0
Otay Mesa Road WB				35.5	0
SR-905 EB				67.4	0
SR-905 EB Off-Ramp				42.4	0
SR-905 EB On-Ramp				52.7	0
SR-905 WB				69.8	0
SR-905 WB Off-Ramp				61.5	0
SR-905 WB On-Ramp				25.7	0
26	3.Fl	73.0	0.0		
Caliente Avenue NB				47.3	0
Caliente Avenue SB				46.6	0
Otay Mesa Road EB				38.8	0
Otay Mesa Road WB				39.1	0
SR-905 EB				68.3	0
SR-905 EB Off-Ramp				43.3	0
SR-905 EB On-Ramp				53.4	0
SR-905 WB				70.7	0
SR-905 WB Off-Ramp				61.4	0
SR-905 WB On-Ramp				33.1	0
27	1.Fl	70.3	0.0		
Caliente Avenue NB				43.7	0
Caliente Avenue SB				43.3	0
Otay Mesa Road EB				33.8	0
Otay Mesa Road WB				34.6	0
SR-905 EB				65.1	0
SR-905 EB Off-Ramp				40.2	0
SR-905 EB On-Ramp				51.5	0
SR-905 WB				68.0	0
SR-905 WB Off-Ramp				59.9	0
SR-905 WB On-Ramp				27.7	0
27	2.Fl	72.7	0.0		
Caliente Avenue NB				45.1	0
Caliente Avenue SB				44.4	0
Otay Mesa Road EB				35.9	0
Otay Mesa Road WB				36.0	0
SR-905 EB				68.0	0
SR-905 EB Off-Ramp				41.3	0
SR-905 EB On-Ramp				53.4	0

SR-905 WB				70.4	0
SR-905 WB Off-Ramp				61.3	0
SR-905 WB On-Ramp				25.4	0
27	3.Fl	73.4	0.0		
Caliente Avenue NB				45.9	0
Caliente Avenue SB				45.1	0
Otay Mesa Road EB				38.8	0
Otay Mesa Road WB				39.3	0
SR-905 EB				68.8	0
SR-905 EB Off-Ramp				41.9	0
SR-905 EB On-Ramp				54.0	0
SR-905 WB				71.1	0
SR-905 WB Off-Ramp				61.3	0
SR-905 WB On-Ramp				30.9	0
28	1.Fl	70.9	0.0		
Caliente Avenue NB				42.6	0
Caliente Avenue SB				42.1	0
Otay Mesa Road EB				36.4	0
Otay Mesa Road WB				36.2	0
SR-905 EB				65.6	0
SR-905 EB Off-Ramp				40.0	0
SR-905 EB On-Ramp				51.9	0
SR-905 WB				68.8	0
SR-905 WB Off-Ramp				59.4	0
SR-905 WB On-Ramp				26.5	0
28	2.Fl	73.3	0.0		
Caliente Avenue NB				43.9	0
Caliente Avenue SB				43.2	0
Otay Mesa Road EB				37.7	0
Otay Mesa Road WB				36.9	0
SR-905 EB				68.6	0
SR-905 EB Off-Ramp				40.0	0
SR-905 EB On-Ramp				54.0	0
SR-905 WB				71.0	0
SR-905 WB Off-Ramp				61.3	0
SR-905 WB On-Ramp				24.3	0
28	3.Fl	73.9	0.0		
Caliente Avenue NB				44.5	0
Caliente Avenue SB				43.8	0
Otay Mesa Road EB				39.0	0
Otay Mesa Road WB				39.5	0
SR-905 EB				69.4	0
SR-905 EB Off-Ramp				40.6	0
SR-905 EB On-Ramp				54.6	0
SR-905 WB				71.6	0
SR-905 WB Off-Ramp				61.3	0
SR-905 WB On-Ramp				26.9	0
29	1.Fl	69.7	0.0		
Caliente Avenue NB				42.9	0
Caliente Avenue SB				42.0	0
Otay Mesa Road EB				41.5	0
Otay Mesa Road WB				41.4	0
SR-905 EB				64.5	0
SR-905 EB Off-Ramp				41.3	0
SR-905 EB On-Ramp				51.0	0

SR-905 WB				67.5	0
SR-905 WB Off-Ramp				58.1	0
SR-905 WB On-Ramp				34.1	0
29	2.Fl	74.0	0.0		
Caliente Avenue NB				42.1	0
Caliente Avenue SB				41.2	0
Otay Mesa Road EB				38.1	0
Otay Mesa Road WB				38.0	0
SR-905 EB				69.5	0
SR-905 EB Off-Ramp				38.6	0
SR-905 EB On-Ramp				54.6	0
SR-905 WB				71.7	0
SR-905 WB Off-Ramp				61.2	0
SR-905 WB On-Ramp				30.7	0
29	3.Fl	74.4	0.0		
Caliente Avenue NB				43.0	0
Caliente Avenue SB				42.0	0
Otay Mesa Road EB				40.8	0
Otay Mesa Road WB				40.8	0
SR-905 EB				69.9	0
SR-905 EB Off-Ramp				39.3	0
SR-905 EB On-Ramp				55.3	0
SR-905 WB				72.1	0
SR-905 WB Off-Ramp				61.3	0
SR-905 WB On-Ramp				23.4	0
30	1.Fl	67.0	0.0		
Caliente Avenue NB				20.1	0
Caliente Avenue SB				19.2	0
Otay Mesa Road EB				55.0	0
Otay Mesa Road WB				53.9	0
SR-905 EB				62.2	0
SR-905 EB Off-Ramp				15.9	0
SR-905 EB On-Ramp				48.8	0
SR-905 WB				64.0	0
SR-905 WB Off-Ramp				54.0	0
SR-905 WB On-Ramp				14.4	0
30	2.Fl	71.5	0.0		
Caliente Avenue NB				26.3	0
Caliente Avenue SB				25.5	0
Otay Mesa Road EB				59.6	0
Otay Mesa Road WB				58.7	0
SR-905 EB				66.9	0
SR-905 EB Off-Ramp				22.3	0
SR-905 EB On-Ramp				51.6	0
SR-905 WB				68.3	0
SR-905 WB Off-Ramp				56.8	0
SR-905 WB On-Ramp				21.2	0
30	3.Fl	72.1	0.0		
Caliente Avenue NB				29.2	0
Caliente Avenue SB				28.5	0
Otay Mesa Road EB				60.5	0
Otay Mesa Road WB				59.7	0
SR-905 EB				67.5	0
SR-905 EB Off-Ramp				25.8	0
SR-905 EB On-Ramp				52.3	0

SR-905 WB				69.0	0
SR-905 WB Off-Ramp				57.4	0
SR-905 WB On-Ramp				23.9	0
31	1.Fl	69.2	0.0		
Caliente Avenue NB				52.4	0
Caliente Avenue SB				51.2	0
Otay Mesa Road EB				52.4	0
Otay Mesa Road WB				51.4	0
SR-905 EB				63.3	0
SR-905 EB Off-Ramp				42.1	0
SR-905 EB On-Ramp				49.9	0
SR-905 WB				66.2	0
SR-905 WB Off-Ramp				61.1	0
SR-905 WB On-Ramp				45.5	0
31	2.Fl	71.6	0.0		
Caliente Avenue NB				53.5	0
Caliente Avenue SB				52.6	0
Otay Mesa Road EB				55.4	0
Otay Mesa Road WB				54.5	0
SR-905 EB				66.2	0
SR-905 EB Off-Ramp				44.1	0
SR-905 EB On-Ramp				51.3	0
SR-905 WB				68.6	0
SR-905 WB Off-Ramp				62.5	0
SR-905 WB On-Ramp				47.0	0
31	3.Fl	72.4	0.0		
Caliente Avenue NB				54.2	0
Caliente Avenue SB				53.3	0
Otay Mesa Road EB				56.3	0
Otay Mesa Road WB				55.5	0
SR-905 EB				67.2	0
SR-905 EB Off-Ramp				45.4	0
SR-905 EB On-Ramp				51.9	0
SR-905 WB				69.5	0
SR-905 WB Off-Ramp				62.4	0
SR-905 WB On-Ramp				48.0	0
32	1.Fl	67.9	0.0		
Caliente Avenue NB				59.0	0
Caliente Avenue SB				56.7	0
Otay Mesa Road EB				54.3	0
Otay Mesa Road WB				53.5	0
SR-905 EB				60.9	0
SR-905 EB Off-Ramp				44.3	0
SR-905 EB On-Ramp				44.8	0
SR-905 WB				63.8	0
SR-905 WB Off-Ramp				58.1	0
SR-905 WB On-Ramp				51.4	0
32	2.Fl	70.5	0.0		
Caliente Avenue NB				60.7	0
Caliente Avenue SB				58.2	0
Otay Mesa Road EB				57.1	0
Otay Mesa Road WB				56.2	0
SR-905 EB				64.6	0
SR-905 EB Off-Ramp				45.9	0
SR-905 EB On-Ramp				48.5	0

SR-905 WB				66.3	0
SR-905 WB Off-Ramp				60.1	0
SR-905 WB On-Ramp				51.9	0
32	3.Fl	71.5	0.0		
Caliente Avenue NB				61.6	0
Caliente Avenue SB				59.3	0
Otay Mesa Road EB				57.9	0
Otay Mesa Road WB				57.1	0
SR-905 EB				65.7	0
SR-905 EB Off-Ramp				47.2	0
SR-905 EB On-Ramp				49.3	0
SR-905 WB				67.5	0
SR-905 WB Off-Ramp				60.5	0
SR-905 WB On-Ramp				52.9	0
33	1.Fl	67.6	0.0		
Caliente Avenue NB				61.7	0
Caliente Avenue SB				59.2	0
Otay Mesa Road EB				60.6	0
Otay Mesa Road WB				58.5	0
SR-905 EB				57.2	0
SR-905 EB Off-Ramp				43.2	0
SR-905 EB On-Ramp				41.6	0
SR-905 WB				59.2	0
SR-905 WB Off-Ramp				50.4	0
SR-905 WB On-Ramp				48.6	0
33	2.Fl	70.0	0.0		
Caliente Avenue NB				63.6	0
Caliente Avenue SB				60.6	0
Otay Mesa Road EB				62.7	0
Otay Mesa Road WB				60.8	0
SR-905 EB				61.3	0
SR-905 EB Off-Ramp				44.5	0
SR-905 EB On-Ramp				44.9	0
SR-905 WB				62.4	0
SR-905 WB Off-Ramp				51.8	0
SR-905 WB On-Ramp				50.0	0
33	3.Fl	70.8	0.0		
Caliente Avenue NB				63.7	0
Caliente Avenue SB				61.6	0
Otay Mesa Road EB				63.7	0
Otay Mesa Road WB				61.7	0
SR-905 EB				62.5	0
SR-905 EB Off-Ramp				45.7	0
SR-905 EB On-Ramp				45.8	0
SR-905 WB				63.5	0
SR-905 WB Off-Ramp				52.5	0
SR-905 WB On-Ramp				50.7	0
34	1.Fl	71.2	0.0		
Caliente Avenue NB				60.4	0
Caliente Avenue SB				58.2	0
Otay Mesa Road EB				68.8	0
Otay Mesa Road WB				64.5	0
SR-905 EB				55.7	0
SR-905 EB Off-Ramp				41.5	0
SR-905 EB On-Ramp				40.6	0

SR-905 WB				56.9	0
SR-905 WB Off-Ramp				47.2	0
SR-905 WB On-Ramp				46.5	0
34	2.Fl	73.4	0.0		
Caliente Avenue NB				62.0	0
Caliente Avenue SB				59.5	0
Otay Mesa Road EB				71.0	0
Otay Mesa Road WB				66.6	0
SR-905 EB				59.3	0
SR-905 EB Off-Ramp				43.4	0
SR-905 EB On-Ramp				43.5	0
SR-905 WB				60.6	0
SR-905 WB Off-Ramp				48.7	0
SR-905 WB On-Ramp				48.0	0
34	3.Fl	73.9	0.0		
Caliente Avenue NB				62.4	0
Caliente Avenue SB				60.5	0
Otay Mesa Road EB				71.1	0
Otay Mesa Road WB				67.6	0
SR-905 EB				60.8	0
SR-905 EB Off-Ramp				44.6	0
SR-905 EB On-Ramp				44.0	0
SR-905 WB				61.9	0
SR-905 WB Off-Ramp				49.4	0
SR-905 WB On-Ramp				48.7	0
35	1.Fl	71.1	0.0		
Caliente Avenue NB				53.9	0
Caliente Avenue SB				52.9	0
Otay Mesa Road EB				69.2	0
Otay Mesa Road WB				65.2	0
SR-905 EB				55.3	0
SR-905 EB Off-Ramp				40.4	0
SR-905 EB On-Ramp				41.5	0
SR-905 WB				56.0	0
SR-905 WB Off-Ramp				47.1	0
SR-905 WB On-Ramp				45.1	0
35	2.Fl	73.3	0.0		
Caliente Avenue NB				55.2	0
Caliente Avenue SB				54.2	0
Otay Mesa Road EB				71.3	0
Otay Mesa Road WB				67.3	0
SR-905 EB				58.5	0
SR-905 EB Off-Ramp				42.5	0
SR-905 EB On-Ramp				43.0	0
SR-905 WB				59.8	0
SR-905 WB Off-Ramp				48.7	0
SR-905 WB On-Ramp				46.6	0
35	3.Fl	73.9	0.0		
Caliente Avenue NB				56.0	0
Caliente Avenue SB				54.9	0
Otay Mesa Road EB				71.6	0
Otay Mesa Road WB				68.3	0
SR-905 EB				60.3	0
SR-905 EB Off-Ramp				43.6	0
SR-905 EB On-Ramp				44.0	0

SR-905 WB	61.3	0
SR-905 WB Off-Ramp	49.4	0
SR-905 WB On-Ramp	47.5	0

ATTACHMENT 6

SoundPLAN Data – Vehicle Traffic Noise, Second-Floor Balconies

Stationing km	ADT Veh/24h	Traffic values Vehicles type	Vehicle name	day Veh/h	Speed km/h	Control device	Constr. Speed km/h	Affect. veh. %	Road surface	Gradient Min / Max %
SR-905 WB	Traffic direction:	In entry direction								
0+000	135336	Total	-	5639	-	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Automobiles	-	4948	105	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Medium trucks	-	229	89	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Heavy trucks	-	350	89	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Buses	-	56	105	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Motorcycles	-	56	105	none	-	-	Average (of DGAC and PCC)	-1.787878788
0+000	135336	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-1.787878788
1+586	-					-	-	-	-	-
SR-905 EB	Traffic direction:	In entry direction								
0+000	135336	Total	-	5639	-	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Automobiles	-	4948	105	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Medium trucks	-	229	89	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Heavy trucks	-	350	89	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Buses	-	56	105	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Motorcycles	-	56	105	none	-	-	Average (of DGAC and PCC)	-0.557377049
0+000	135336	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-0.557377049
1+590	-					-	-	-	-	-
Otay Mesa Road WB	Traffic direction:	In entry direction								
0+000	66048	Total	-	2752	-	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Automobiles	-	2413	89	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Medium trucks	-	112	89	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Heavy trucks	-	171	89	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Buses	-	28	89	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Motorcycles	-	28	89	none	-	-	Average (of DGAC and PCC)	-0.6
0+000	66048	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-0.6
0+895	-					-	-	-	-	-
Otay Mesa Road EB	Traffic direction:	In entry direction								
0+000	66048	Total	-	2752	-	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Automobiles	-	2413	89	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Medium trucks	-	112	89	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Heavy trucks	-	171	89	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Buses	-	28	89	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Motorcycles	-	28	89	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+000	66048	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-1.333333333
0+893	-					-	-	-	-	-
Caliente Avenue NB	Traffic direction:	In entry direction								
0+000	42024	Total	-	1751	-	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Automobiles	-	1535	48	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Medium trucks	-	71	48	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Heavy trucks	-	109	48	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Buses	-	18	48	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Motorcycles	-	18	48	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+000	42024	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-2.111111111
0+783	-					-	-	-	-	-
Caliente Avenue SB	Traffic direction:	In entry direction								
0+000	42024	Total	-	1751	-	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Automobiles	-	1535	48	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Medium trucks	-	71	48	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Heavy trucks	-	109	48	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Buses	-	18	48	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Motorcycles	-	18	48	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+000	42024	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-0.565217391
0+768	-					-	-	-	-	-
SR-905 WB Off-Ramp	Traffic direction:	In entry direction								
0+000	34536	Total	-	1439	-	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Automobiles	-	1263	48	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Medium trucks	-	59	48	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Heavy trucks	-	89	48	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Buses	-	14	48	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Motorcycles	-	14	48	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+000	34536	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-0.047619048
0+638	-					-	-	-	-	-
SR-905 WB On-Ramp	Traffic direction:	In entry direction								
0+000	34536	Total	-	1439	-	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+000	34536	Automobiles	-	1263	48	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+000	34536	Medium trucks	-	59	48	none	-	-	Average (of DGAC and PCC)	-1.035714286

0+000	34536	Heavy trucks	-	89	48	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+000	34536	Buses	-	14	48	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+000	34536	Motorcycles	-	14	48	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+000	34536	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-1.035714286
0+464	-					-	-	-	-	-
SR-905 EB Off-Ramp		Traffic direction:	In entry direction							
0+000	34536	Total	-	1439	-	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Automobiles	-	1263	48	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Medium trucks	-	59	48	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Heavy trucks	-	89	48	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Buses	-	14	48	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Motorcycles	-	14	48	none	-	-	Average (of DGAC and PCC)	-0.525
0+000	34536	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-0.525
0+488	-					-	-	-	-	-
SR-905 EB On-Ramp		Traffic direction:	In entry direction							
0+000	34536	Total	-	1439	-	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Automobiles	-	1263	48	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Medium trucks	-	59	48	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Heavy trucks	-	89	48	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Buses	-	14	48	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Motorcycles	-	14	48	none	-	-	Average (of DGAC and PCC)	-9
0+000	34536	Auxiliary Vehicle	-	-	-	none	-	-	Average (of DGAC and PCC)	-9
0+575	-					-	-	-	-	-

4135.1 California Terraces PA-61
SoundPLAN Data - Traffic - 2nd Floor Balconies

No.	Coordinates X	Y	Floor	Height	Limit L(Aeq1h)	Level w/o NP L(Aeq1h)	Level w. NP L(Aeq1h)	Difference L(Aeq1h)	Conflict L(Aeq1h)
	in meter			m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
1	498,843.10	3,603,409.36	1.Fl	165.92	-	73.9	0	-73.9	-
2	498,846.94	3,603,401.40	1.Fl	165.92	-	65.6	0	-65.6	-
3	498,846.34	3,603,392.95	1.Fl	165.92	-	63.4	0	-63.4	-
4	498,846.74	3,603,388.59	1.Fl	165.92	-	59.0	0	-59.0	-
5	498,846.34	3,603,381.03	1.Fl	165.92	-	56.9	0	-56.9	-
6	498,845.18	3,603,370.91	1.Fl	165.92	-	62.3	0	-62.3	-
7	498,832.49	3,603,371.03	1.Fl	165.92	-	66.3	0	-66.3	-
8	498,859.51	3,603,406.84	1.Fl	165.98	-	73.9	0	-73.9	-
9	498,855.83	3,603,398.60	1.Fl	165.97	-	63.3	0	-63.3	-
10	498,855.87	3,603,392.08	1.Fl	165.97	-	61.1	0	-61.1	-
11	498,855.95	3,603,384.56	1.Fl	165.97	-	56.0	0	-56.0	-
12	498,856.99	3,603,374.87	1.Fl	165.98	-	63.6	0	-63.6	-
13	498,869.71	3,603,374.87	1.Fl	165.98	-	60.6	0	-60.6	-
14	498,889.60	3,603,406.72	1.Fl	166.17	-	74.2	0	-74.2	-
15	498,893.20	3,603,398.39	1.Fl	166.19	-	65.1	0	-65.1	-
16	498,893.28	3,603,391.87	1.Fl	166.19	-	64.1	0	-64.1	-
17	498,892.80	3,603,384.63	1.Fl	166.19	-	58.0	0	-58.0	-
18	498,891.76	3,603,374.51	1.Fl	166.19	-	60.4	0	-60.4	-
19	498,879.20	3,603,374.59	1.Fl	166.19	-	63.3	0	-63.3	-
20	498,906.01	3,603,404.04	1.Fl	166.13	-	73.8	0	-73.8	-
21	498,902.33	3,603,395.64	1.Fl	166.14	-	63.0	0	-63.0	-
22	498,902.37	3,603,389.03	1.Fl	166.14	-	60.9	0	-60.9	-
23	498,902.49	3,603,381.67	1.Fl	166.14	-	55.5	0	-55.5	-
24	498,903.57	3,603,371.95	1.Fl	166.13	-	61.1	0	-61.1	-
25	498,916.26	3,603,372.03	1.Fl	166.13	-	57.7	0	-57.7	-
26	498,936.45	3,603,404.17	1.Fl	165.78	-	74.3	0	-74.3	-
27	498,939.97	3,603,395.89	1.Fl	165.80	-	63.6	0	-63.6	-
28	498,940.01	3,603,389.36	1.Fl	165.80	-	61.7	0	-61.7	-
29	498,939.69	3,603,381.88	1.Fl	165.80	-	56.3	0	-56.3	-
30	498,938.85	3,603,372.08	1.Fl	165.80	-	57.9	0	-57.9	-
31	498,926.25	3,603,372.04	1.Fl	165.80	-	60.2	0	-60.2	-
32	498,952.90	3,603,403.66	1.Fl	165.63	-	74.2	0	-74.2	-
33	498,949.34	3,603,395.13	1.Fl	165.75	-	63.9	0	-63.9	-
34	498,949.26	3,603,388.77	1.Fl	165.75	-	62.1	0	-62.1	-
35	498,949.38	3,603,381.41	1.Fl	165.75	-	56.6	0	-56.6	-
36	498,950.50	3,603,371.32	1.Fl	165.74	-	58.5	0	-58.5	-
37	498,963.27	3,603,371.52	1.Fl	165.73	-	58.3	0	-58.3	-
38	498,983.60	3,603,401.25	1.Fl	165.22	-	73.8	0	-73.8	-
39	498,987.04	3,603,393.09	1.Fl	165.25	-	64.3	0	-64.3	-
40	498,987.12	3,603,386.69	1.Fl	165.25	-	62.4	0	-62.4	-
41	498,986.84	3,603,379.29	1.Fl	165.25	-	56.9	0	-56.9	-
42	498,985.92	3,603,369.48	1.Fl	165.25	-	57.5	0	-57.5	-
43	498,973.19	3,603,369.48	1.Fl	165.25	-	58.1	0	-58.1	-
44	499,000.17	3,603,399.63	1.Fl	165.17	-	73.6	0	-73.6	-
45	498,996.41	3,603,391.11	1.Fl	165.20	-	64.5	0	-64.5	-
46	498,996.61	3,603,383.63	1.Fl	165.20	-	59.6	0	-59.6	-
47	498,997.69	3,603,373.62	1.Fl	165.19	-	58.3	0	-58.3	-
48	499,010.41	3,603,373.70	1.Fl	165.19	-	61.5	0	-61.5	-
49	499,030.31	3,603,399.22	1.Fl	164.84	-	73.8	0	-73.8	-
50	499,033.75	3,603,390.82	1.Fl	164.85	-	64.0	0	-64.0	-
51	499,033.47	3,603,383.42	1.Fl	164.85	-	58.5	0	-58.5	-
52	499,032.55	3,603,373.69	1.Fl	164.85	-	62.4	0	-62.4	-
53	499,019.82	3,603,373.29	1.Fl	164.85	-	60.5	0	-60.5	-
54	499,046.66	3,603,397.81	1.Fl	164.79	-	73.5	0	-73.5	-
55	499,043.02	3,603,389.25	1.Fl	164.81	-	63.6	0	-63.6	-
56	499,042.94	3,603,381.81	1.Fl	164.82	-	59.9	0	-59.9	-
57	499,043.90	3,603,371.96	1.Fl	164.79	-	61.5	0	-61.5	-
58	499,056.83	3,603,371.96	1.Fl	164.79	-	66.1	0	-66.1	-
59	499,051.75	3,603,341.78	1.Fl	165.06	-	64.7	0	-64.7	-
60	499,043.39	3,603,338.06	1.Fl	165.11	-	59.0	0	-59.0	-

61	499,035.82	3,603,338.42	1.Fl	165.12	-	56.2	0	-56.2	-
62	499,025.86	3,603,339.42	1.Fl	165.12	-	61.1	0	-61.1	-
63	499,025.90	3,603,352.26	1.Fl	165.12	-	59.3	0	-59.3	-
64	499,005.87	3,603,352.14	1.Fl	165.67	-	61.6	0	-61.6	-
65	499,006.03	3,603,339.50	1.Fl	165.67	-	60.5	0	-60.5	-
66	498,995.95	3,603,338.14	1.Fl	165.67	-	55.2	0	-55.2	-
67	498,988.62	3,603,338.02	1.Fl	165.67	-	55.3	0	-55.3	-
68	498,983.98	3,603,338.46	1.Fl	165.67	-	55.1	0	-55.1	-
69	498,975.90	3,603,338.22	1.Fl	165.67	-	55.2	0	-55.2	-
70	498,967.30	3,603,341.66	1.Fl	165.67	-	55.3	0	-55.3	-
71	498,960.37	3,603,341.74	1.Fl	166.01	-	57.1	0	-57.1	-
72	498,951.97	3,603,337.70	1.Fl	166.01	-	55.0	0	-55.0	-
73	498,945.45	3,603,338.06	1.Fl	166.01	-	54.7	0	-54.7	-
74	498,937.85	3,603,338.30	1.Fl	166.01	-	54.4	0	-54.4	-
75	498,928.12	3,603,339.34	1.Fl	166.01	-	58.6	0	-58.6	-
76	498,928.16	3,603,351.94	1.Fl	166.01	-	59.7	0	-59.7	-
77	498,915.80	3,603,352.14	1.Fl	166.19	-	59.7	0	-59.7	-
78	498,915.96	3,603,339.38	1.Fl	166.19	-	57.7	0	-57.7	-
79	498,905.92	3,603,338.34	1.Fl	166.19	-	54.3	0	-54.3	-
80	498,898.47	3,603,338.26	1.Fl	166.19	-	55.3	0	-55.3	-
81	498,892.07	3,603,338.26	1.Fl	166.19	-	54.9	0	-54.9	-
82	498,883.87	3,603,341.86	1.Fl	166.19	-	59.4	0	-59.4	-
83	498,877.47	3,603,324.61	1.Fl	166.19	-	58.9	0	-58.9	-
84	498,885.63	3,603,328.33	1.Fl	166.19	-	57.4	0	-57.4	-
85	498,894.07	3,603,327.81	1.Fl	166.19	-	56.5	0	-56.5	-
86	498,898.67	3,603,328.29	1.Fl	166.19	-	54.6	0	-54.6	-
87	498,905.92	3,603,328.13	1.Fl	166.19	-	54.6	0	-54.6	-
88	498,916.04	3,603,327.17	1.Fl	166.19	-	58.4	0	-58.4	-
89	498,915.68	3,603,314.21	1.Fl	166.19	-	62.5	0	-62.5	-
90	498,928.32	3,603,314.25	1.Fl	166.01	-	56.6	0	-56.6	-
91	498,928.16	3,603,327.33	1.Fl	166.01	-	57.4	0	-57.4	-
92	498,938.21	3,603,328.09	1.Fl	166.01	-	54.9	0	-54.9	-
93	498,945.61	3,603,328.29	1.Fl	166.01	-	54.7	0	-54.7	-
94	498,951.97	3,603,328.29	1.Fl	166.01	-	54.6	0	-54.6	-
95	498,960.13	3,603,324.53	1.Fl	166.01	-	56.3	0	-56.3	-
96	498,969.18	3,603,324.73	1.Fl	165.67	-	55.5	0	-55.5	-
97	498,977.42	3,603,328.21	1.Fl	165.67	-	54.8	0	-54.8	-
98	498,985.90	3,603,327.73	1.Fl	165.67	-	54.9	0	-54.9	-
99	498,990.42	3,603,328.25	1.Fl	165.67	-	55.0	0	-55.0	-
100	498,997.75	3,603,328.13	1.Fl	165.67	-	55.5	0	-55.5	-
101	499,007.79	3,603,327.13	1.Fl	165.67	-	60.4	0	-60.4	-
102	499,007.55	3,603,314.21	1.Fl	165.67	-	65.2	0	-65.2	-
103	499,025.08	3,603,314.21	1.Fl	165.12	-	65.3	0	-65.3	-
104	499,024.84	3,603,326.97	1.Fl	165.12	-	58.6	0	-58.6	-
105	499,034.84	3,603,328.21	1.Fl	165.12	-	56.4	0	-56.4	-
106	499,042.40	3,603,328.21	1.Fl	165.12	-	57.0	0	-57.0	-
107	499,046.93	3,603,327.69	1.Fl	165.06	-	60.2	0	-60.2	-
108	499,055.45	3,603,328.25	1.Fl	165.06	-	61.9	0	-61.9	-
109	499,063.37	3,603,324.73	1.Fl	165.06	-	65.4	0	-65.4	-
110	499,053.49	3,603,302.93	1.Fl	165.76	-	62.5	0	-62.5	-
111	499,049.44	3,603,294.56	1.Fl	165.76	-	59.6	0	-59.6	-
112	499,049.64	3,603,287.96	1.Fl	165.76	-	62.1	0	-62.1	-
113	499,049.88	3,603,280.48	1.Fl	165.76	-	64.0	0	-64.0	-
114	499,051.04	3,603,270.75	1.Fl	165.76	-	74.5	0	-74.5	-
115	499,063.69	3,603,270.79	1.Fl	165.76	-	74.9	0	-74.9	-
116	499,025.96	3,603,270.83	1.Fl	165.70	-	74.1	0	-74.1	-
117	499,038.68	3,603,270.75	1.Fl	165.70	-	74.8	0	-74.8	-
118	499,039.88	3,603,280.68	1.Fl	165.70	-	63.7	0	-63.7	-
119	499,040.00	3,603,287.92	1.Fl	165.70	-	61.1	0	-61.1	-
120	499,039.96	3,603,294.40	1.Fl	165.70	-	58.6	0	-58.6	-
121	499,036.44	3,603,303.13	1.Fl	165.70	-	60.4	0	-60.4	-
122	499,006.15	3,603,270.07	1.Fl	165.70	-	74.4	0	-74.4	-
123	498,993.79	3,603,270.03	1.Fl	165.70	-	73.9	0	-73.9	-

124	498,992.71	3,603,280.04	1.Fl	165.70	-	62.7	0	-62.7	-
125	498,992.59	3,603,287.48	1.Fl	165.70	-	60.3	0	-60.3	-
126	498,992.59	3,603,293.72	1.Fl	165.70	-	57.6	0	-57.6	-
127	498,995.91	3,603,302.28	1.Fl	165.70	-	58.1	0	-58.1	-
128	498,979.06	3,603,302.12	1.Fl	165.76	-	57.4	0	-57.4	-
129	498,982.86	3,603,293.60	1.Fl	165.76	-	57.8	0	-57.8	-
130	498,982.82	3,603,287.16	1.Fl	165.76	-	63.1	0	-63.1	-
131	498,982.46	3,603,279.88	1.Fl	165.76	-	63.6	0	-63.6	-
132	498,981.38	3,603,269.87	1.Fl	165.76	-	74.2	0	-74.2	-
133	498,968.78	3,603,269.99	1.Fl	165.76	-	73.6	0	-73.6	-
134	498,959.29	3,603,269.99	1.Fl	165.76	-	73.9	0	-73.9	-
135	498,946.65	3,603,269.79	1.Fl	165.76	-	73.5	0	-73.5	-
136	498,945.69	3,603,279.80	1.Fl	165.76	-	62.0	0	-62.0	-
137	498,945.45	3,603,287.24	1.Fl	165.76	-	60.4	0	-60.4	-
138	498,945.57	3,603,293.68	1.Fl	165.76	-	57.7	0	-57.7	-
139	498,949.01	3,603,302.12	1.Fl	165.76	-	57.2	0	-57.2	-
140	498,931.93	3,603,302.20	1.Fl	165.70	-	56.3	0	-56.3	-
141	498,935.93	3,603,293.68	1.Fl	165.70	-	58.3	0	-58.3	-
142	498,935.73	3,603,287.12	1.Fl	165.70	-	61.7	0	-61.7	-
143	498,935.49	3,603,279.76	1.Fl	165.70	-	63.0	0	-63.0	-
144	498,934.21	3,603,269.91	1.Fl	165.70	-	73.8	0	-73.8	-
145	498,921.60	3,603,269.95	1.Fl	165.70	-	73.2	0	-73.2	-
146	498,912.32	3,603,270.03	1.Fl	165.86	-	73.5	0	-73.5	-
147	498,899.71	3,603,269.99	1.Fl	165.86	-	73.1	0	-73.1	-
148	498,898.71	3,603,279.96	1.Fl	165.86	-	62.2	0	-62.2	-
149	498,898.55	3,603,287.32	1.Fl	165.86	-	60.1	0	-60.1	-
150	498,898.55	3,603,293.52	1.Fl	165.86	-	57.4	0	-57.4	-
151	498,902.04	3,603,302.53	1.Fl	165.86	-	56.8	0	-56.8	-
152	498,884.87	3,603,302.28	1.Fl	165.92	-	57.9	0	-57.9	-
153	498,888.71	3,603,293.64	1.Fl	165.91	-	58.3	0	-58.3	-
154	498,888.75	3,603,287.24	1.Fl	165.91	-	63.0	0	-63.0	-
155	498,888.35	3,603,279.80	1.Fl	165.92	-	63.4	0	-63.4	-
156	498,887.27	3,603,269.87	1.Fl	165.92	-	73.3	0	-73.3	-
157	498,874.67	3,603,270.03	1.Fl	165.92	-	72.8	0	-72.8	-
158	498,856.62	3,603,282.64	1.Fl	166.16	-	63.4	0	-63.4	-
159	498,856.62	3,603,269.99	1.Fl	166.16	-	72.6	0	-72.6	-
160	498,846.62	3,603,268.75	1.Fl	166.16	-	69.7	0	-69.7	-
161	498,839.13	3,603,268.87	1.Fl	166.16	-	69.7	0	-69.7	-
162	498,831.01	3,603,272.35	1.Fl	166.16	-	67.2	0	-67.2	-
163	498,830.93	3,603,302.81	1.Fl	166.80	-	65.5	0	-65.5	-
164	498,839.17	3,603,306.77	1.Fl	166.80	-	60.3	0	-60.3	-
165	498,846.58	3,603,306.61	1.Fl	166.80	-	57.9	0	-57.9	-
166	498,856.70	3,603,305.37	1.Fl	166.80	-	62.8	0	-62.8	-
167	498,856.58	3,603,292.44	1.Fl	166.80	-	67.5	0	-67.5	-
168	498,863.06	3,603,330.41	1.Fl	166.65	-	59.5	0	-59.5	-
169	498,863.30	3,603,317.49	1.Fl	166.65	-	65.4	0	-65.4	-
170	498,853.30	3,603,316.37	1.Fl	166.65	-	60.6	0	-60.6	-
171	498,845.70	3,603,316.41	1.Fl	166.65	-	57.8	0	-57.8	-
172	498,839.25	3,603,316.33	1.Fl	166.65	-	60.4	0	-60.4	-
173	498,831.01	3,603,319.81	1.Fl	166.65	-	65.2	0	-65.2	-

Source name			Lane	Level w/o NP L(Aeq1h) dB(A)
1	1.Fl	73.9	0.0	
Caliente Avenue NB				46.0
Caliente Avenue SB				45.3
Otay Mesa Road EB				72.3
Otay Mesa Road WB				68.6
SR-905 EB				45.9
SR-905 EB Off-Ramp				32.1
SR-905 EB On-Ramp				31.2
SR-905 WB				46.6
SR-905 WB Off-Ramp				34.3
SR-905 WB On-Ramp				33.9
2	1.Fl	65.6	0.0	
Caliente Avenue NB				41.8
Caliente Avenue SB				41.4
Otay Mesa Road EB				63.5
Otay Mesa Road WB				60.7
SR-905 EB				49.5
SR-905 EB Off-Ramp				36.4
SR-905 EB On-Ramp				35.4
SR-905 WB				49.5
SR-905 WB Off-Ramp				37.7
SR-905 WB On-Ramp				36.1
3	1.Fl	63.4	0.0	
Caliente Avenue NB				43.8
Caliente Avenue SB				41.7
Otay Mesa Road EB				60.8
Otay Mesa Road WB				58.2
SR-905 EB				51.0
SR-905 EB Off-Ramp				36.1
SR-905 EB On-Ramp				37.5
SR-905 WB				51.5
SR-905 WB Off-Ramp				40.0
SR-905 WB On-Ramp				38.2
4	1.Fl	59.0	0.0	
Caliente Avenue NB				43.1
Caliente Avenue SB				41.4
Otay Mesa Road EB				53.8
Otay Mesa Road WB				52.2
SR-905 EB				52.2
SR-905 EB Off-Ramp				35.7
SR-905 EB On-Ramp				38.8
SR-905 WB				52.2
SR-905 WB Off-Ramp				42.0
SR-905 WB On-Ramp				36.8
5	1.Fl	56.9	0.0	
Caliente Avenue NB				42.6
Caliente Avenue SB				41.5
Otay Mesa Road EB				49.7
Otay Mesa Road WB				48.9
SR-905 EB				50.9
SR-905 EB Off-Ramp				36.6
SR-905 EB On-Ramp				36.6

SR-905 WB				51.5
SR-905 WB Off-Ramp				40.5
SR-905 WB On-Ramp				36.0
6	1.Fl	62.3	0.0	
Caliente Avenue NB				46.1
Caliente Avenue SB				45.1
Otay Mesa Road EB				51.3
Otay Mesa Road WB				50.5
SR-905 EB				57.4
SR-905 EB Off-Ramp				40.0
SR-905 EB On-Ramp				43.4
SR-905 WB				58.6
SR-905 WB Off-Ramp				48.7
SR-905 WB On-Ramp				35.8
7	1.Fl	66.3	0.0	
Caliente Avenue NB				53.0
Caliente Avenue SB				52.3
Otay Mesa Road EB				55.4
Otay Mesa Road WB				52.7
SR-905 EB				61.2
SR-905 EB Off-Ramp				44.5
SR-905 EB On-Ramp				45.9
SR-905 WB				62.5
SR-905 WB Off-Ramp				52.1
SR-905 WB On-Ramp				46.8
8	1.Fl	73.9	0.0	
Caliente Avenue NB				46.3
Caliente Avenue SB				45.4
Otay Mesa Road EB				72.4
Otay Mesa Road WB				68.5
SR-905 EB				45.8
SR-905 EB Off-Ramp				31.4
SR-905 EB On-Ramp				31.2
SR-905 WB				46.5
SR-905 WB Off-Ramp				34.1
SR-905 WB On-Ramp				34.1
9	1.Fl	63.3	0.0	
Caliente Avenue NB				40.5
Caliente Avenue SB				39.7
Otay Mesa Road EB				61.2
Otay Mesa Road WB				58.3
SR-905 EB				47.9
SR-905 EB Off-Ramp				33.3
SR-905 EB On-Ramp				34.0
SR-905 WB				48.6
SR-905 WB Off-Ramp				36.7
SR-905 WB On-Ramp				35.0
10	1.Fl	61.1	0.0	
Caliente Avenue NB				40.3
Caliente Avenue SB				39.7
Otay Mesa Road EB				58.6
Otay Mesa Road WB				55.8
SR-905 EB				48.2
SR-905 EB Off-Ramp				33.3
SR-905 EB On-Ramp				34.4

SR-905 WB				48.6
SR-905 WB Off-Ramp				37.4
SR-905 WB On-Ramp				35.4
11	1.Fl	56.0	0.0	
Caliente Avenue NB				39.7
Caliente Avenue SB				39.0
Otay Mesa Road EB				50.1
Otay Mesa Road WB				49.2
SR-905 EB				49.2
SR-905 EB Off-Ramp				32.7
SR-905 EB On-Ramp				36.1
SR-905 WB				49.9
SR-905 WB Off-Ramp				38.7
SR-905 WB On-Ramp				35.3
12	1.Fl	63.6	0.0	
Caliente Avenue NB				48.9
Caliente Avenue SB				48.0
Otay Mesa Road EB				51.2
Otay Mesa Road WB				50.5
SR-905 EB				59.1
SR-905 EB Off-Ramp				42.5
SR-905 EB On-Ramp				43.4
SR-905 WB				59.8
SR-905 WB Off-Ramp				49.5
SR-905 WB On-Ramp				41.8
13	1.Fl	60.6	0.0	
Caliente Avenue NB				44.4
Caliente Avenue SB				43.3
Otay Mesa Road EB				51.7
Otay Mesa Road WB				51.1
SR-905 EB				55.1
SR-905 EB Off-Ramp				35.0
SR-905 EB On-Ramp				42.8
SR-905 WB				56.4
SR-905 WB Off-Ramp				46.6
SR-905 WB On-Ramp				36.1
14	1.Fl	74.2	0.0	
Caliente Avenue NB				44.6
Caliente Avenue SB				43.9
Otay Mesa Road EB				72.8
Otay Mesa Road WB				68.7
SR-905 EB				45.2
SR-905 EB Off-Ramp				29.9
SR-905 EB On-Ramp				31.3
SR-905 WB				46.0
SR-905 WB Off-Ramp				33.9
SR-905 WB On-Ramp				32.4
15	1.Fl	65.1	0.0	
Caliente Avenue NB				41.5
Caliente Avenue SB				40.2
Otay Mesa Road EB				62.9
Otay Mesa Road WB				60.1
SR-905 EB				49.3
SR-905 EB Off-Ramp				35.6
SR-905 EB On-Ramp				36.1

SR-905 WB				49.8
SR-905 WB Off-Ramp				37.6
SR-905 WB On-Ramp				35.8
16	1.Fl	64.1	0.0	
Caliente Avenue NB				41.5
Caliente Avenue SB				39.8
Otay Mesa Road EB				61.9
Otay Mesa Road WB				59.0
SR-905 EB				49.7
SR-905 EB Off-Ramp				35.7
SR-905 EB On-Ramp				36.5
SR-905 WB				50.1
SR-905 WB Off-Ramp				37.8
SR-905 WB On-Ramp				36.5
17	1.Fl	58.0	0.0	
Caliente Avenue NB				41.7
Caliente Avenue SB				40.5
Otay Mesa Road EB				52.0
Otay Mesa Road WB				51.0
SR-905 EB				51.1
SR-905 EB Off-Ramp				37.1
SR-905 EB On-Ramp				36.4
SR-905 WB				52.1
SR-905 WB Off-Ramp				40.3
SR-905 WB On-Ramp				36.9
18	1.Fl	60.4	0.0	
Caliente Avenue NB				45.6
Caliente Avenue SB				44.7
Otay Mesa Road EB				53.0
Otay Mesa Road WB				52.2
SR-905 EB				54.3
SR-905 EB Off-Ramp				38.5
SR-905 EB On-Ramp				39.7
SR-905 WB				55.3
SR-905 WB Off-Ramp				44.5
SR-905 WB On-Ramp				39.9
19	1.Fl	63.3	0.0	
Caliente Avenue NB				48.9
Caliente Avenue SB				48.4
Otay Mesa Road EB				51.8
Otay Mesa Road WB				51.1
SR-905 EB				58.4
SR-905 EB Off-Ramp				43.0
SR-905 EB On-Ramp				41.4
SR-905 WB				59.5
SR-905 WB Off-Ramp				48.9
SR-905 WB On-Ramp				44.8
20	1.Fl	73.8	0.0	
Caliente Avenue NB				44.2
Caliente Avenue SB				43.7
Otay Mesa Road EB				72.4
Otay Mesa Road WB				68.4
SR-905 EB				46.3
SR-905 EB Off-Ramp				30.6
SR-905 EB On-Ramp				32.8

SR-905 WB				46.8
SR-905 WB Off-Ramp				35.0
SR-905 WB On-Ramp				32.6
21	1.Fl	63.0	0.0	
Caliente Avenue NB				38.5
Caliente Avenue SB				37.2
Otay Mesa Road EB				60.7
Otay Mesa Road WB				58.2
SR-905 EB				47.7
SR-905 EB Off-Ramp				31.8
SR-905 EB On-Ramp				35.0
SR-905 WB				48.5
SR-905 WB Off-Ramp				37.0
SR-905 WB On-Ramp				33.2
22	1.Fl	60.9	0.0	
Caliente Avenue NB				38.7
Caliente Avenue SB				37.4
Otay Mesa Road EB				58.5
Otay Mesa Road WB				55.6
SR-905 EB				48.1
SR-905 EB Off-Ramp				33.2
SR-905 EB On-Ramp				34.9
SR-905 WB				48.6
SR-905 WB Off-Ramp				37.1
SR-905 WB On-Ramp				33.2
23	1.Fl	55.5	0.0	
Caliente Avenue NB				37.8
Caliente Avenue SB				36.8
Otay Mesa Road EB				50.0
Otay Mesa Road WB				49.5
SR-905 EB				48.2
SR-905 EB Off-Ramp				32.0
SR-905 EB On-Ramp				35.4
SR-905 WB				48.9
SR-905 WB Off-Ramp				37.3
SR-905 WB On-Ramp				34.2
24	1.Fl	61.1	0.0	
Caliente Avenue NB				47.5
Caliente Avenue SB				46.9
Otay Mesa Road EB				52.6
Otay Mesa Road WB				51.7
SR-905 EB				55.4
SR-905 EB Off-Ramp				40.9
SR-905 EB On-Ramp				37.4
SR-905 WB				56.5
SR-905 WB Off-Ramp				43.8
SR-905 WB On-Ramp				44.5
25	1.Fl	57.7	0.0	
Caliente Avenue NB				40.8
Caliente Avenue SB				39.8
Otay Mesa Road EB				50.8
Otay Mesa Road WB				50.3
SR-905 EB				51.3
SR-905 EB Off-Ramp				33.5
SR-905 EB On-Ramp				38.4

SR-905 WB				52.5
SR-905 WB Off-Ramp				40.5
SR-905 WB On-Ramp				34.5
26	1.Fl	74.3	0.0	
Caliente Avenue NB				42.2
Caliente Avenue SB				41.4
Otay Mesa Road EB				72.8
Otay Mesa Road WB				68.8
SR-905 EB				46.5
SR-905 EB Off-Ramp				30.3
SR-905 EB On-Ramp				33.0
SR-905 WB				47.2
SR-905 WB Off-Ramp				35.6
SR-905 WB On-Ramp				31.0
27	1.Fl	63.6	0.0	
Caliente Avenue NB				41.2
Caliente Avenue SB				40.2
Otay Mesa Road EB				61.5
Otay Mesa Road WB				58.5
SR-905 EB				49.2
SR-905 EB Off-Ramp				33.6
SR-905 EB On-Ramp				36.3
SR-905 WB				49.6
SR-905 WB Off-Ramp				37.6
SR-905 WB On-Ramp				35.2
28	1.Fl	61.7	0.0	
Caliente Avenue NB				39.0
Caliente Avenue SB				37.7
Otay Mesa Road EB				59.3
Otay Mesa Road WB				56.5
SR-905 EB				49.1
SR-905 EB Off-Ramp				33.6
SR-905 EB On-Ramp				36.2
SR-905 WB				49.7
SR-905 WB Off-Ramp				37.6
SR-905 WB On-Ramp				34.7
29	1.Fl	56.3	0.0	
Caliente Avenue NB				38.7
Caliente Avenue SB				37.6
Otay Mesa Road EB				50.7
Otay Mesa Road WB				50.1
SR-905 EB				49.0
SR-905 EB Off-Ramp				33.1
SR-905 EB On-Ramp				36.0
SR-905 WB				49.8
SR-905 WB Off-Ramp				38.0
SR-905 WB On-Ramp				33.7
30	1.Fl	57.9	0.0	
Caliente Avenue NB				40.4
Caliente Avenue SB				38.9
Otay Mesa Road EB				52.2
Otay Mesa Road WB				51.6
SR-905 EB				50.7
SR-905 EB Off-Ramp				33.1
SR-905 EB On-Ramp				37.6

SR-905 WB				52.0
SR-905 WB Off-Ramp				39.8
SR-905 WB On-Ramp				35.5
31	1.Fl	60.2	0.0	
Caliente Avenue NB				44.8
Caliente Avenue SB				44.0
Otay Mesa Road EB				49.4
Otay Mesa Road WB				48.9
SR-905 EB				55.0
SR-905 EB Off-Ramp				38.5
SR-905 EB On-Ramp				39.5
SR-905 WB				56.4
SR-905 WB Off-Ramp				44.4
SR-905 WB On-Ramp				42.7
32	1.Fl	74.2	0.0	
Caliente Avenue NB				41.4
Caliente Avenue SB				40.8
Otay Mesa Road EB				72.7
Otay Mesa Road WB				68.7
SR-905 EB				46.7
SR-905 EB Off-Ramp				29.3
SR-905 EB On-Ramp				33.0
SR-905 WB				47.3
SR-905 WB Off-Ramp				35.7
SR-905 WB On-Ramp				30.3
33	1.Fl	63.9	0.0	
Caliente Avenue NB				37.9
Caliente Avenue SB				37.1
Otay Mesa Road EB				61.8
Otay Mesa Road WB				59.0
SR-905 EB				48.0
SR-905 EB Off-Ramp				30.6
SR-905 EB On-Ramp				35.3
SR-905 WB				48.7
SR-905 WB Off-Ramp				37.2
SR-905 WB On-Ramp				31.3
34	1.Fl	62.1	0.0	
Caliente Avenue NB				38.2
Caliente Avenue SB				37.0
Otay Mesa Road EB				59.7
Otay Mesa Road WB				57.3
SR-905 EB				48.2
SR-905 EB Off-Ramp				31.1
SR-905 EB On-Ramp				35.5
SR-905 WB				48.9
SR-905 WB Off-Ramp				37.6
SR-905 WB On-Ramp				32.0
35	1.Fl	56.6	0.0	
Caliente Avenue NB				37.0
Caliente Avenue SB				36.1
Otay Mesa Road EB				51.9
Otay Mesa Road WB				51.0
SR-905 EB				48.5
SR-905 EB Off-Ramp				31.9
SR-905 EB On-Ramp				36.1

SR-905 WB				49.3
SR-905 WB Off-Ramp				38.0
SR-905 WB On-Ramp				32.2
36	1.Fl	58.5	0.0	
Caliente Avenue NB				43.4
Caliente Avenue SB				42.7
Otay Mesa Road EB				51.2
Otay Mesa Road WB				50.7
SR-905 EB				52.2
SR-905 EB Off-Ramp				36.8
SR-905 EB On-Ramp				37.4
SR-905 WB				53.5
SR-905 WB Off-Ramp				39.3
SR-905 WB On-Ramp				42.1
37	1.Fl	58.3	0.0	
Caliente Avenue NB				39.4
Caliente Avenue SB				38.4
Otay Mesa Road EB				49.9
Otay Mesa Road WB				49.6
SR-905 EB				52.7
SR-905 EB Off-Ramp				32.4
SR-905 EB On-Ramp				39.6
SR-905 WB				54.1
SR-905 WB Off-Ramp				42.1
SR-905 WB On-Ramp				35.7
38	1.Fl	73.8	0.0	
Caliente Avenue NB				39.8
Caliente Avenue SB				39.2
Otay Mesa Road EB				72.2
Otay Mesa Road WB				68.4
SR-905 EB				46.2
SR-905 EB Off-Ramp				28.2
SR-905 EB On-Ramp				33.5
SR-905 WB				46.9
SR-905 WB Off-Ramp				35.2
SR-905 WB On-Ramp				30.5
39	1.Fl	64.3	0.0	
Caliente Avenue NB				38.3
Caliente Avenue SB				37.6
Otay Mesa Road EB				62.1
Otay Mesa Road WB				59.5
SR-905 EB				48.5
SR-905 EB Off-Ramp				32.0
SR-905 EB On-Ramp				35.2
SR-905 WB				48.8
SR-905 WB Off-Ramp				37.0
SR-905 WB On-Ramp				33.3
40	1.Fl	62.4	0.0	
Caliente Avenue NB				36.2
Caliente Avenue SB				35.1
Otay Mesa Road EB				59.9
Otay Mesa Road WB				57.7
SR-905 EB				48.1
SR-905 EB Off-Ramp				30.9
SR-905 EB On-Ramp				35.4

SR-905 WB				49.1
SR-905 WB Off-Ramp				37.3
SR-905 WB On-Ramp				33.2
41	1.Fl	56.9	0.0	
Caliente Avenue NB				36.9
Caliente Avenue SB				35.2
Otay Mesa Road EB				52.5
Otay Mesa Road WB				51.5
SR-905 EB				48.3
SR-905 EB Off-Ramp				30.1
SR-905 EB On-Ramp				35.9
SR-905 WB				49.2
SR-905 WB Off-Ramp				37.7
SR-905 WB On-Ramp				32.0
42	1.Fl	57.5	0.0	
Caliente Avenue NB				37.9
Caliente Avenue SB				36.4
Otay Mesa Road EB				52.9
Otay Mesa Road WB				51.9
SR-905 EB				49.0
SR-905 EB Off-Ramp				27.6
SR-905 EB On-Ramp				36.3
SR-905 WB				50.5
SR-905 WB Off-Ramp				38.7
SR-905 WB On-Ramp				27.1
43	1.Fl	58.1	0.0	
Caliente Avenue NB				42.1
Caliente Avenue SB				41.6
Otay Mesa Road EB				51.5
Otay Mesa Road WB				50.7
SR-905 EB				50.7
SR-905 EB Off-Ramp				35.1
SR-905 EB On-Ramp				36.2
SR-905 WB				53.3
SR-905 WB Off-Ramp				38.8
SR-905 WB On-Ramp				40.7
44	1.Fl	73.6	0.0	
Caliente Avenue NB				39.7
Caliente Avenue SB				38.7
Otay Mesa Road EB				72.1
Otay Mesa Road WB				68.3
SR-905 EB				46.6
SR-905 EB Off-Ramp				29.9
SR-905 EB On-Ramp				33.1
SR-905 WB				47.3
SR-905 WB Off-Ramp				35.8
SR-905 WB On-Ramp				30.8
45	1.Fl	64.5	0.0	
Caliente Avenue NB				37.8
Caliente Avenue SB				36.2
Otay Mesa Road EB				62.6
Otay Mesa Road WB				59.4
SR-905 EB				48.0
SR-905 EB Off-Ramp				30.4
SR-905 EB On-Ramp				35.6

SR-905 WB				48.6
SR-905 WB Off-Ramp				37.4
SR-905 WB On-Ramp				29.8
46	1.Fl	59.6	0.0	
Caliente Avenue NB				37.2
Caliente Avenue SB				35.5
Otay Mesa Road EB				56.8
Otay Mesa Road WB				54.3
SR-905 EB				48.2
SR-905 EB Off-Ramp				29.8
SR-905 EB On-Ramp				35.7
SR-905 WB				49.0
SR-905 WB Off-Ramp				37.8
SR-905 WB On-Ramp				30.9
47	1.Fl	58.3	0.0	
Caliente Avenue NB				37.7
Caliente Avenue SB				36.6
Otay Mesa Road EB				53.8
Otay Mesa Road WB				52.4
SR-905 EB				50.2
SR-905 EB Off-Ramp				29.9
SR-905 EB On-Ramp				37.5
SR-905 WB				51.2
SR-905 WB Off-Ramp				39.6
SR-905 WB On-Ramp				30.9
48	1.Fl	61.5	0.0	
Caliente Avenue NB				36.9
Caliente Avenue SB				35.4
Otay Mesa Road EB				52.7
Otay Mesa Road WB				51.3
SR-905 EB				56.3
SR-905 EB Off-Ramp				27.3
SR-905 EB On-Ramp				42.5
SR-905 WB				57.8
SR-905 WB Off-Ramp				44.8
SR-905 WB On-Ramp				31.9
49	1.Fl	73.8	0.0	
Caliente Avenue NB				39.5
Caliente Avenue SB				38.2
Otay Mesa Road EB				72.2
Otay Mesa Road WB				68.4
SR-905 EB				46.6
SR-905 EB Off-Ramp				29.8
SR-905 EB On-Ramp				33.1
SR-905 WB				47.4
SR-905 WB Off-Ramp				35.8
SR-905 WB On-Ramp				30.9
50	1.Fl	64.0	0.0	
Caliente Avenue NB				37.5
Caliente Avenue SB				36.2
Otay Mesa Road EB				61.8
Otay Mesa Road WB				59.3
SR-905 EB				47.8
SR-905 EB Off-Ramp				27.5
SR-905 EB On-Ramp				35.3

SR-905 WB				48.5
SR-905 WB Off-Ramp				37.4
SR-905 WB On-Ramp				28.4
51	1.Fl	58.5	0.0	
Caliente Avenue NB				35.9
Caliente Avenue SB				34.4
Otay Mesa Road EB				54.9
Otay Mesa Road WB				53.4
SR-905 EB				48.9
SR-905 EB Off-Ramp				28.1
SR-905 EB On-Ramp				36.3
SR-905 WB				49.4
SR-905 WB Off-Ramp				38.3
SR-905 WB On-Ramp				28.4
52	1.Fl	62.4	0.0	
Caliente Avenue NB				36.0
Caliente Avenue SB				34.8
Otay Mesa Road EB				54.4
Otay Mesa Road WB				53.1
SR-905 EB				57.2
SR-905 EB Off-Ramp				29.1
SR-905 EB On-Ramp				38.2
SR-905 WB				58.5
SR-905 WB Off-Ramp				45.5
SR-905 WB On-Ramp				32.9
53	1.Fl	60.5	0.0	
Caliente Avenue NB				38.6
Caliente Avenue SB				38.0
Otay Mesa Road EB				51.2
Otay Mesa Road WB				50.4
SR-905 EB				55.4
SR-905 EB Off-Ramp				31.5
SR-905 EB On-Ramp				42.7
SR-905 WB				56.6
SR-905 WB Off-Ramp				45.2
SR-905 WB On-Ramp				34.4
54	1.Fl	73.5	0.0	
Caliente Avenue NB				38.5
Caliente Avenue SB				37.9
Otay Mesa Road EB				71.9
Otay Mesa Road WB				68.2
SR-905 EB				46.6
SR-905 EB Off-Ramp				29.1
SR-905 EB On-Ramp				32.9
SR-905 WB				47.5
SR-905 WB Off-Ramp				35.8
SR-905 WB On-Ramp				30.4
55	1.Fl	63.6	0.0	
Caliente Avenue NB				36.8
Caliente Avenue SB				35.5
Otay Mesa Road EB				61.2
Otay Mesa Road WB				59.0
SR-905 EB				48.3
SR-905 EB Off-Ramp				30.3
SR-905 EB On-Ramp				35.0

SR-905 WB				49.1
SR-905 WB Off-Ramp				37.8
SR-905 WB On-Ramp				30.8
56	1.Fl	59.9	0.0	
Caliente Avenue NB				36.3
Caliente Avenue SB				34.8
Otay Mesa Road EB				56.6
Otay Mesa Road WB				55.1
SR-905 EB				49.0
SR-905 EB Off-Ramp				30.2
SR-905 EB On-Ramp				35.2
SR-905 WB				50.0
SR-905 WB Off-Ramp				38.3
SR-905 WB On-Ramp				31.5
57	1.Fl	61.5	0.0	
Caliente Avenue NB				38.6
Caliente Avenue SB				38.0
Otay Mesa Road EB				53.2
Otay Mesa Road WB				52.0
SR-905 EB				56.6
SR-905 EB Off-Ramp				32.1
SR-905 EB On-Ramp				40.3
SR-905 WB				57.3
SR-905 WB Off-Ramp				45.3
SR-905 WB On-Ramp				36.7
58	1.Fl	66.1	0.0	
Caliente Avenue NB				33.0
Caliente Avenue SB				31.7
Otay Mesa Road EB				60.0
Otay Mesa Road WB				57.3
SR-905 EB				60.2
SR-905 EB Off-Ramp				24.5
SR-905 EB On-Ramp				44.9
SR-905 WB				61.3
SR-905 WB Off-Ramp				49.0
SR-905 WB On-Ramp				24.9
59	1.Fl	64.7	0.0	
Caliente Avenue NB				30.9
Caliente Avenue SB				29.8
Otay Mesa Road EB				59.8
Otay Mesa Road WB				58.0
SR-905 EB				57.2
SR-905 EB Off-Ramp				25.2
SR-905 EB On-Ramp				38.3
SR-905 WB				58.8
SR-905 WB Off-Ramp				45.7
SR-905 WB On-Ramp				26.3
60	1.Fl	59.0	0.0	
Caliente Avenue NB				35.0
Caliente Avenue SB				34.0
Otay Mesa Road EB				54.0
Otay Mesa Road WB				53.4
SR-905 EB				51.0
SR-905 EB Off-Ramp				29.1
SR-905 EB On-Ramp				36.5

SR-905 WB				52.3
SR-905 WB Off-Ramp				39.9
SR-905 WB On-Ramp				30.9
61	1.Fl	56.2	0.0	
Caliente Avenue NB				35.2
Caliente Avenue SB				34.4
Otay Mesa Road EB				50.8
Otay Mesa Road WB				50.0
SR-905 EB				49.0
SR-905 EB Off-Ramp				29.7
SR-905 EB On-Ramp				36.1
SR-905 WB				50.0
SR-905 WB Off-Ramp				39.1
SR-905 WB On-Ramp				30.8
62	1.Fl	61.1	0.0	
Caliente Avenue NB				37.3
Caliente Avenue SB				36.2
Otay Mesa Road EB				50.3
Otay Mesa Road WB				49.7
SR-905 EB				56.4
SR-905 EB Off-Ramp				30.6
SR-905 EB On-Ramp				43.4
SR-905 WB				57.7
SR-905 WB Off-Ramp				46.2
SR-905 WB On-Ramp				31.7
63	1.Fl	59.3	0.0	
Caliente Avenue NB				39.3
Caliente Avenue SB				38.4
Otay Mesa Road EB				53.5
Otay Mesa Road WB				52.8
SR-905 EB				52.3
SR-905 EB Off-Ramp				33.1
SR-905 EB On-Ramp				39.4
SR-905 WB				53.5
SR-905 WB Off-Ramp				41.9
SR-905 WB On-Ramp				35.9
64	1.Fl	61.6	0.0	
Caliente Avenue NB				36.7
Caliente Avenue SB				35.3
Otay Mesa Road EB				57.7
Otay Mesa Road WB				56.1
SR-905 EB				52.9
SR-905 EB Off-Ramp				30.8
SR-905 EB On-Ramp				39.0
SR-905 WB				53.8
SR-905 WB Off-Ramp				42.0
SR-905 WB On-Ramp				31.1
65	1.Fl	60.5	0.0	
Caliente Avenue NB				35.3
Caliente Avenue SB				34.6
Otay Mesa Road EB				50.7
Otay Mesa Road WB				50.0
SR-905 EB				55.6
SR-905 EB Off-Ramp				31.7
SR-905 EB On-Ramp				42.6

SR-905 WB				56.9
SR-905 WB Off-Ramp				45.5
SR-905 WB On-Ramp				32.1
66	1.Fl	55.2	0.0	
Caliente Avenue NB				35.9
Caliente Avenue SB				34.9
Otay Mesa Road EB				47.3
Otay Mesa Road WB				47.2
SR-905 EB				49.4
SR-905 EB Off-Ramp				29.0
SR-905 EB On-Ramp				36.4
SR-905 WB				50.5
SR-905 WB Off-Ramp				39.3
SR-905 WB On-Ramp				30.8
67	1.Fl	55.3	0.0	
Caliente Avenue NB				36.5
Caliente Avenue SB				35.6
Otay Mesa Road EB				46.8
Otay Mesa Road WB				46.7
SR-905 EB				49.8
SR-905 EB Off-Ramp				29.9
SR-905 EB On-Ramp				36.9
SR-905 WB				50.9
SR-905 WB Off-Ramp				39.8
SR-905 WB On-Ramp				31.5
68	1.Fl	55.1	0.0	
Caliente Avenue NB				36.8
Caliente Avenue SB				35.7
Otay Mesa Road EB				46.9
Otay Mesa Road WB				46.7
SR-905 EB				49.6
SR-905 EB Off-Ramp				29.6
SR-905 EB On-Ramp				36.6
SR-905 WB				50.6
SR-905 WB Off-Ramp				39.6
SR-905 WB On-Ramp				31.8
69	1.Fl	55.2	0.0	
Caliente Avenue NB				36.7
Caliente Avenue SB				35.6
Otay Mesa Road EB				46.4
Otay Mesa Road WB				46.3
SR-905 EB				49.8
SR-905 EB Off-Ramp				30.7
SR-905 EB On-Ramp				36.8
SR-905 WB				50.9
SR-905 WB Off-Ramp				39.9
SR-905 WB On-Ramp				31.9
70	1.Fl	55.3	0.0	
Caliente Avenue NB				37.5
Caliente Avenue SB				36.4
Otay Mesa Road EB				47.2
Otay Mesa Road WB				47.1
SR-905 EB				49.7
SR-905 EB Off-Ramp				31.2
SR-905 EB On-Ramp				36.8

SR-905 WB				50.6
SR-905 WB Off-Ramp				39.9
SR-905 WB On-Ramp				32.6
71	1.Fl	57.1	0.0	
Caliente Avenue NB				39.5
Caliente Avenue SB				38.5
Otay Mesa Road EB				50.3
Otay Mesa Road WB				50.0
SR-905 EB				50.8
SR-905 EB Off-Ramp				34.8
SR-905 EB On-Ramp				37.5
SR-905 WB				51.7
SR-905 WB Off-Ramp				40.4
SR-905 WB On-Ramp				34.7
72	1.Fl	55.0	0.0	
Caliente Avenue NB				37.5
Caliente Avenue SB				36.3
Otay Mesa Road EB				46.3
Otay Mesa Road WB				46.2
SR-905 EB				49.6
SR-905 EB Off-Ramp				29.6
SR-905 EB On-Ramp				37.0
SR-905 WB				50.7
SR-905 WB Off-Ramp				39.6
SR-905 WB On-Ramp				32.1
73	1.Fl	54.7	0.0	
Caliente Avenue NB				36.9
Caliente Avenue SB				36.0
Otay Mesa Road EB				45.9
Otay Mesa Road WB				45.7
SR-905 EB				49.3
SR-905 EB Off-Ramp				30.2
SR-905 EB On-Ramp				36.4
SR-905 WB				50.4
SR-905 WB Off-Ramp				39.4
SR-905 WB On-Ramp				32.7
74	1.Fl	54.4	0.0	
Caliente Avenue NB				37.2
Caliente Avenue SB				36.0
Otay Mesa Road EB				46.4
Otay Mesa Road WB				46.5
SR-905 EB				48.6
SR-905 EB Off-Ramp				29.6
SR-905 EB On-Ramp				35.8
SR-905 WB				49.7
SR-905 WB Off-Ramp				38.7
SR-905 WB On-Ramp				32.1
75	1.Fl	58.6	0.0	
Caliente Avenue NB				40.5
Caliente Avenue SB				39.9
Otay Mesa Road EB				47.6
Otay Mesa Road WB				47.4
SR-905 EB				53.7
SR-905 EB Off-Ramp				32.1
SR-905 EB On-Ramp				40.6

SR-905 WB				55.0
SR-905 WB Off-Ramp				44.8
SR-905 WB On-Ramp				34.3
76	1.Fl	59.7	0.0	
Caliente Avenue NB				43.5
Caliente Avenue SB				42.7
Otay Mesa Road EB				54.2
Otay Mesa Road WB				53.1
SR-905 EB				52.2
SR-905 EB Off-Ramp				36.6
SR-905 EB On-Ramp				37.8
SR-905 WB				53.4
SR-905 WB Off-Ramp				42.7
SR-905 WB On-Ramp				37.4
77	1.Fl	59.7	0.0	
Caliente Avenue NB				41.5
Caliente Avenue SB				40.1
Otay Mesa Road EB				55.5
Otay Mesa Road WB				54.5
SR-905 EB				50.5
SR-905 EB Off-Ramp				34.7
SR-905 EB On-Ramp				37.5
SR-905 WB				51.3
SR-905 WB Off-Ramp				39.9
SR-905 WB On-Ramp				34.2
78	1.Fl	57.7	0.0	
Caliente Avenue NB				41.0
Caliente Avenue SB				39.6
Otay Mesa Road EB				48.4
Otay Mesa Road WB				48.4
SR-905 EB				52.3
SR-905 EB Off-Ramp				34.7
SR-905 EB On-Ramp				38.8
SR-905 WB				53.5
SR-905 WB Off-Ramp				42.0
SR-905 WB On-Ramp				36.6
79	1.Fl	54.3	0.0	
Caliente Avenue NB				38.5
Caliente Avenue SB				36.9
Otay Mesa Road EB				46.0
Otay Mesa Road WB				45.9
SR-905 EB				48.7
SR-905 EB Off-Ramp				29.9
SR-905 EB On-Ramp				35.6
SR-905 WB				49.6
SR-905 WB Off-Ramp				38.7
SR-905 WB On-Ramp				32.1
80	1.Fl	55.3	0.0	
Caliente Avenue NB				40.2
Caliente Avenue SB				39.2
Otay Mesa Road EB				47.6
Otay Mesa Road WB				46.9
SR-905 EB				49.4
SR-905 EB Off-Ramp				31.0
SR-905 EB On-Ramp				36.4

SR-905 WB				50.4
SR-905 WB Off-Ramp				39.7
SR-905 WB On-Ramp				32.6
81	1.Fl	54.9	0.0	
Caliente Avenue NB				39.6
Caliente Avenue SB				38.4
Otay Mesa Road EB				45.9
Otay Mesa Road WB				45.7
SR-905 EB				49.4
SR-905 EB Off-Ramp				31.3
SR-905 EB On-Ramp				36.6
SR-905 WB				50.4
SR-905 WB Off-Ramp				39.8
SR-905 WB On-Ramp				32.6
82	1.Fl	59.4	0.0	
Caliente Avenue NB				48.8
Caliente Avenue SB				48.2
Otay Mesa Road EB				49.8
Otay Mesa Road WB				47.4
SR-905 EB				53.1
SR-905 EB Off-Ramp				38.8
SR-905 EB On-Ramp				37.0
SR-905 WB				55.2
SR-905 WB Off-Ramp				41.8
SR-905 WB On-Ramp				44.0
83	1.Fl	58.9	0.0	
Caliente Avenue NB				43.8
Caliente Avenue SB				43.4
Otay Mesa Road EB				53.1
Otay Mesa Road WB				51.8
SR-905 EB				51.6
SR-905 EB Off-Ramp				33.3
SR-905 EB On-Ramp				38.7
SR-905 WB				53.0
SR-905 WB Off-Ramp				43.4
SR-905 WB On-Ramp				31.6
84	1.Fl	57.4	0.0	
Caliente Avenue NB				43.1
Caliente Avenue SB				42.3
Otay Mesa Road EB				50.2
Otay Mesa Road WB				49.6
SR-905 EB				51.4
SR-905 EB Off-Ramp				34.8
SR-905 EB On-Ramp				37.6
SR-905 WB				51.9
SR-905 WB Off-Ramp				42.2
SR-905 WB On-Ramp				32.3
85	1.Fl	56.5	0.0	
Caliente Avenue NB				42.6
Caliente Avenue SB				41.6
Otay Mesa Road EB				49.1
Otay Mesa Road WB				48.4
SR-905 EB				50.4
SR-905 EB Off-Ramp				34.3
SR-905 EB On-Ramp				36.2

SR-905 WB				51.4
SR-905 WB Off-Ramp				41.3
SR-905 WB On-Ramp				32.1
86	1.Fl	54.6	0.0	
Caliente Avenue NB				41.0
Caliente Avenue SB				39.8
Otay Mesa Road EB				46.1
Otay Mesa Road WB				45.0
SR-905 EB				49.0
SR-905 EB Off-Ramp				31.3
SR-905 EB On-Ramp				36.1
SR-905 WB				49.9
SR-905 WB Off-Ramp				39.6
SR-905 WB On-Ramp				32.2
87	1.Fl	54.6	0.0	
Caliente Avenue NB				38.7
Caliente Avenue SB				37.7
Otay Mesa Road EB				44.6
Otay Mesa Road WB				44.6
SR-905 EB				49.5
SR-905 EB Off-Ramp				31.5
SR-905 EB On-Ramp				37.3
SR-905 WB				50.4
SR-905 WB Off-Ramp				40.2
SR-905 WB On-Ramp				31.0
88	1.Fl	58.4	0.0	
Caliente Avenue NB				40.9
Caliente Avenue SB				40.0
Otay Mesa Road EB				51.8
Otay Mesa Road WB				51.2
SR-905 EB				51.8
SR-905 EB Off-Ramp				35.6
SR-905 EB On-Ramp				38.8
SR-905 WB				52.9
SR-905 WB Off-Ramp				41.6
SR-905 WB On-Ramp				35.9
89	1.Fl	62.5	0.0	
Caliente Avenue NB				39.7
Caliente Avenue SB				38.8
Otay Mesa Road EB				44.8
Otay Mesa Road WB				45.1
SR-905 EB				58.1
SR-905 EB Off-Ramp				35.3
SR-905 EB On-Ramp				44.6
SR-905 WB				59.6
SR-905 WB Off-Ramp				49.8
SR-905 WB On-Ramp				33.2
90	1.Fl	56.6	0.0	
Caliente Avenue NB				38.6
Caliente Avenue SB				37.5
Otay Mesa Road EB				45.5
Otay Mesa Road WB				45.3
SR-905 EB				51.8
SR-905 EB Off-Ramp				32.3
SR-905 EB On-Ramp				38.9

SR-905 WB				52.9
SR-905 WB Off-Ramp				42.3
SR-905 WB On-Ramp				32.4
91	1.Fl	57.4	0.0	
Caliente Avenue NB				41.7
Caliente Avenue SB				41.0
Otay Mesa Road EB				51.5
Otay Mesa Road WB				50.9
SR-905 EB				50.2
SR-905 EB Off-Ramp				31.9
SR-905 EB On-Ramp				37.5
SR-905 WB				51.1
SR-905 WB Off-Ramp				40.6
SR-905 WB On-Ramp				32.1
92	1.Fl	54.9	0.0	
Caliente Avenue NB				36.9
Caliente Avenue SB				35.3
Otay Mesa Road EB				45.0
Otay Mesa Road WB				45.1
SR-905 EB				49.8
SR-905 EB Off-Ramp				30.7
SR-905 EB On-Ramp				37.6
SR-905 WB				50.8
SR-905 WB Off-Ramp				40.5
SR-905 WB On-Ramp				31.4
93	1.Fl	54.7	0.0	
Caliente Avenue NB				38.1
Caliente Avenue SB				36.8
Otay Mesa Road EB				45.5
Otay Mesa Road WB				45.9
SR-905 EB				49.4
SR-905 EB Off-Ramp				31.1
SR-905 EB On-Ramp				36.4
SR-905 WB				50.2
SR-905 WB Off-Ramp				39.7
SR-905 WB On-Ramp				31.7
94	1.Fl	54.6	0.0	
Caliente Avenue NB				37.3
Caliente Avenue SB				35.9
Otay Mesa Road EB				46.0
Otay Mesa Road WB				46.1
SR-905 EB				49.2
SR-905 EB Off-Ramp				30.7
SR-905 EB On-Ramp				36.3
SR-905 WB				50.1
SR-905 WB Off-Ramp				39.4
SR-905 WB On-Ramp				32.0
95	1.Fl	56.3	0.0	
Caliente Avenue NB				38.7
Caliente Avenue SB				37.9
Otay Mesa Road EB				46.2
Otay Mesa Road WB				46.3
SR-905 EB				51.3
SR-905 EB Off-Ramp				33.7
SR-905 EB On-Ramp				38.5

SR-905 WB				52.2
SR-905 WB Off-Ramp				41.3
SR-905 WB On-Ramp				33.8
96	1.Fl	55.5	0.0	
Caliente Avenue NB				37.7
Caliente Avenue SB				36.4
Otay Mesa Road EB				46.0
Otay Mesa Road WB				46.1
SR-905 EB				50.3
SR-905 EB Off-Ramp				31.5
SR-905 EB On-Ramp				38.0
SR-905 WB				51.2
SR-905 WB Off-Ramp				40.8
SR-905 WB On-Ramp				31.1
97	1.Fl	54.8	0.0	
Caliente Avenue NB				37.1
Caliente Avenue SB				35.7
Otay Mesa Road EB				46.3
Otay Mesa Road WB				46.5
SR-905 EB				49.3
SR-905 EB Off-Ramp				30.7
SR-905 EB On-Ramp				36.4
SR-905 WB				50.3
SR-905 WB Off-Ramp				39.8
SR-905 WB On-Ramp				31.5
98	1.Fl	54.9	0.0	
Caliente Avenue NB				37.0
Caliente Avenue SB				35.6
Otay Mesa Road EB				46.4
Otay Mesa Road WB				46.5
SR-905 EB				49.4
SR-905 EB Off-Ramp				31.1
SR-905 EB On-Ramp				36.4
SR-905 WB				50.5
SR-905 WB Off-Ramp				39.9
SR-905 WB On-Ramp				31.5
99	1.Fl	55.0	0.0	
Caliente Avenue NB				36.7
Caliente Avenue SB				35.4
Otay Mesa Road EB				46.4
Otay Mesa Road WB				46.5
SR-905 EB				49.5
SR-905 EB Off-Ramp				30.8
SR-905 EB On-Ramp				36.8
SR-905 WB				50.5
SR-905 WB Off-Ramp				40.0
SR-905 WB On-Ramp				31.5
100	1.Fl	55.5	0.0	
Caliente Avenue NB				36.1
Caliente Avenue SB				34.4
Otay Mesa Road EB				46.3
Otay Mesa Road WB				46.4
SR-905 EB				50.3
SR-905 EB Off-Ramp				30.3
SR-905 EB On-Ramp				38.1

SR-905 WB				51.3
SR-905 WB Off-Ramp				40.9
SR-905 WB On-Ramp				30.8
101	1.Fl	60.4	0.0	
Caliente Avenue NB				36.4
Caliente Avenue SB				35.3
Otay Mesa Road EB				54.3
Otay Mesa Road WB				53.3
SR-905 EB				53.8
SR-905 EB Off-Ramp				29.4
SR-905 EB On-Ramp				41.3
SR-905 WB				55.3
SR-905 WB Off-Ramp				43.9
SR-905 WB On-Ramp				32.3
102	1.Fl	65.2	0.0	
Caliente Avenue NB				35.8
Caliente Avenue SB				34.5
Otay Mesa Road EB				46.5
Otay Mesa Road WB				46.0
SR-905 EB				60.9
SR-905 EB Off-Ramp				29.2
SR-905 EB On-Ramp				47.8
SR-905 WB				62.6
SR-905 WB Off-Ramp				51.3
SR-905 WB On-Ramp				30.3
103	1.Fl	65.3	0.0	
Caliente Avenue NB				36.9
Caliente Avenue SB				35.7
Otay Mesa Road EB				45.5
Otay Mesa Road WB				45.3
SR-905 EB				61.1
SR-905 EB Off-Ramp				31.3
SR-905 EB On-Ramp				47.9
SR-905 WB				62.7
SR-905 WB Off-Ramp				51.4
SR-905 WB On-Ramp				31.0
104	1.Fl	58.6	0.0	
Caliente Avenue NB				36.9
Caliente Avenue SB				36.0
Otay Mesa Road EB				52.6
Otay Mesa Road WB				51.9
SR-905 EB				51.8
SR-905 EB Off-Ramp				31.7
SR-905 EB On-Ramp				39.5
SR-905 WB				52.9
SR-905 WB Off-Ramp				42.2
SR-905 WB On-Ramp				32.6
105	1.Fl	56.4	0.0	
Caliente Avenue NB				35.8
Caliente Avenue SB				34.8
Otay Mesa Road EB				49.3
Otay Mesa Road WB				48.6
SR-905 EB				50.5
SR-905 EB Off-Ramp				30.3
SR-905 EB On-Ramp				37.9

SR-905 WB				51.5
SR-905 WB Off-Ramp				41.1
SR-905 WB On-Ramp				30.6
106	1.Fl	57.0	0.0	
Caliente Avenue NB				35.3
Caliente Avenue SB				34.5
Otay Mesa Road EB				51.7
Otay Mesa Road WB				50.9
SR-905 EB				49.5
SR-905 EB Off-Ramp				30.3
SR-905 EB On-Ramp				36.4
SR-905 WB				50.6
SR-905 WB Off-Ramp				40.0
SR-905 WB On-Ramp				31.3
107	1.Fl	60.2	0.0	
Caliente Avenue NB				35.1
Caliente Avenue SB				34.3
Otay Mesa Road EB				56.8
Otay Mesa Road WB				55.8
SR-905 EB				49.0
SR-905 EB Off-Ramp				30.1
SR-905 EB On-Ramp				35.7
SR-905 WB				50.0
SR-905 WB Off-Ramp				39.4
SR-905 WB On-Ramp				31.2
108	1.Fl	61.9	0.0	
Caliente Avenue NB				35.6
Caliente Avenue SB				34.4
Otay Mesa Road EB				58.9
Otay Mesa Road WB				57.7
SR-905 EB				48.5
SR-905 EB Off-Ramp				30.1
SR-905 EB On-Ramp				35.4
SR-905 WB				49.5
SR-905 WB Off-Ramp				38.8
SR-905 WB On-Ramp				31.2
109	1.Fl	65.6	0.0	
Caliente Avenue NB				31.0
Caliente Avenue SB				29.9
Otay Mesa Road EB				58.9
Otay Mesa Road WB				57.5
SR-905 EB				59.6
SR-905 EB Off-Ramp				25.4
SR-905 EB On-Ramp				42.7
SR-905 WB				61.0
SR-905 WB Off-Ramp				48.5
SR-905 WB On-Ramp				25.9
110	1.Fl	62.5	0.0	
Caliente Avenue NB				35.7
Caliente Avenue SB				34.4
Otay Mesa Road EB				54.0
Otay Mesa Road WB				52.8
SR-905 EB				58.1
SR-905 EB Off-Ramp				29.8
SR-905 EB On-Ramp				44.1

SR-905 WB				58.0
SR-905 WB Off-Ramp				47.3
SR-905 WB On-Ramp				30.7
111	1.Fl	59.6	0.0	
Caliente Avenue NB				37.9
Caliente Avenue SB				36.9
Otay Mesa Road EB				48.7
Otay Mesa Road WB				48.6
SR-905 EB				54.8
SR-905 EB Off-Ramp				33.8
SR-905 EB On-Ramp				41.9
SR-905 WB				56.0
SR-905 WB Off-Ramp				45.0
SR-905 WB On-Ramp				31.8
112	1.Fl	62.1	0.0	
Caliente Avenue NB				38.0
Caliente Avenue SB				36.6
Otay Mesa Road EB				46.2
Otay Mesa Road WB				46.0
SR-905 EB				57.7
SR-905 EB Off-Ramp				32.9
SR-905 EB On-Ramp				44.7
SR-905 WB				59.1
SR-905 WB Off-Ramp				48.1
SR-905 WB On-Ramp				31.7
113	1.Fl	64.0	0.0	
Caliente Avenue NB				37.6
Caliente Avenue SB				36.1
Otay Mesa Road EB				45.6
Otay Mesa Road WB				45.4
SR-905 EB				60.7
SR-905 EB Off-Ramp				32.7
SR-905 EB On-Ramp				46.5
SR-905 WB				60.5
SR-905 WB Off-Ramp				50.1
SR-905 WB On-Ramp				30.8
114	1.Fl	74.5	0.0	
Caliente Avenue NB				43.5
Caliente Avenue SB				42.5
Otay Mesa Road EB				43.3
Otay Mesa Road WB				42.8
SR-905 EB				69.8
SR-905 EB Off-Ramp				39.3
SR-905 EB On-Ramp				55.9
SR-905 WB				72.2
SR-905 WB Off-Ramp				61.8
SR-905 WB On-Ramp				28.9
115	1.Fl	74.9	0.0	
Caliente Avenue NB				30.3
Caliente Avenue SB				29.9
Otay Mesa Road EB				42.0
Otay Mesa Road WB				41.5
SR-905 EB				70.6
SR-905 EB Off-Ramp				24.4
SR-905 EB On-Ramp				55.9

SR-905 WB				72.5
SR-905 WB Off-Ramp				61.5
SR-905 WB On-Ramp				24.8
116	1.Fl	74.1	0.0	
Caliente Avenue NB				43.6
Caliente Avenue SB				43.1
Otay Mesa Road EB				42.0
Otay Mesa Road WB				41.8
SR-905 EB				69.2
SR-905 EB Off-Ramp				39.9
SR-905 EB On-Ramp				55.4
SR-905 WB				71.8
SR-905 WB Off-Ramp				61.7
SR-905 WB On-Ramp				29.7
117	1.Fl	74.8	0.0	
Caliente Avenue NB				34.4
Caliente Avenue SB				33.5
Otay Mesa Road EB				42.7
Otay Mesa Road WB				42.4
SR-905 EB				70.4
SR-905 EB Off-Ramp				30.4
SR-905 EB On-Ramp				56.0
SR-905 WB				72.3
SR-905 WB Off-Ramp				61.5
SR-905 WB On-Ramp				29.0
118	1.Fl	63.7	0.0	
Caliente Avenue NB				35.7
Caliente Avenue SB				33.5
Otay Mesa Road EB				44.8
Otay Mesa Road WB				44.8
SR-905 EB				59.2
SR-905 EB Off-Ramp				28.1
SR-905 EB On-Ramp				45.5
SR-905 WB				61.1
SR-905 WB Off-Ramp				50.8
SR-905 WB On-Ramp				28.9
119	1.Fl	61.1	0.0	
Caliente Avenue NB				34.1
Caliente Avenue SB				33.1
Otay Mesa Road EB				45.4
Otay Mesa Road WB				45.3
SR-905 EB				56.7
SR-905 EB Off-Ramp				28.5
SR-905 EB On-Ramp				44.0
SR-905 WB				58.2
SR-905 WB Off-Ramp				47.6
SR-905 WB On-Ramp				28.9
120	1.Fl	58.6	0.0	
Caliente Avenue NB				34.8
Caliente Avenue SB				33.1
Otay Mesa Road EB				45.7
Otay Mesa Road WB				45.5
SR-905 EB				54.4
SR-905 EB Off-Ramp				27.8
SR-905 EB On-Ramp				41.4

SR-905 WB				55.3
SR-905 WB Off-Ramp				44.3
SR-905 WB On-Ramp				28.3
121	1.Fl	60.4	0.0	
Caliente Avenue NB				37.1
Caliente Avenue SB				35.5
Otay Mesa Road EB				47.3
Otay Mesa Road WB				47.1
SR-905 EB				56.2
SR-905 EB Off-Ramp				31.4
SR-905 EB On-Ramp				42.0
SR-905 WB				57.1
SR-905 WB Off-Ramp				46.0
SR-905 WB On-Ramp				31.8
122	1.Fl	74.4	0.0	
Caliente Avenue NB				35.6
Caliente Avenue SB				35.3
Otay Mesa Road EB				43.4
Otay Mesa Road WB				43.0
SR-905 EB				69.9
SR-905 EB Off-Ramp				33.0
SR-905 EB On-Ramp				55.4
SR-905 WB				72.0
SR-905 WB Off-Ramp				61.5
SR-905 WB On-Ramp				30.6
123	1.Fl	73.9	0.0	
Caliente Avenue NB				44.5
Caliente Avenue SB				43.7
Otay Mesa Road EB				42.4
Otay Mesa Road WB				42.3
SR-905 EB				69.0
SR-905 EB Off-Ramp				40.3
SR-905 EB On-Ramp				55.1
SR-905 WB				71.6
SR-905 WB Off-Ramp				62.0
SR-905 WB On-Ramp				29.8
124	1.Fl	62.7	0.0	
Caliente Avenue NB				36.7
Caliente Avenue SB				36.0
Otay Mesa Road EB				44.3
Otay Mesa Road WB				44.4
SR-905 EB				58.2
SR-905 EB Off-Ramp				33.3
SR-905 EB On-Ramp				45.2
SR-905 WB				60.1
SR-905 WB Off-Ramp				49.8
SR-905 WB On-Ramp				30.8
125	1.Fl	60.3	0.0	
Caliente Avenue NB				38.8
Caliente Avenue SB				36.8
Otay Mesa Road EB				44.6
Otay Mesa Road WB				44.9
SR-905 EB				55.7
SR-905 EB Off-Ramp				33.6
SR-905 EB On-Ramp				43.4

SR-905 WB				57.4
SR-905 WB Off-Ramp				47.2
SR-905 WB On-Ramp				32.2
126	1.Fl	57.6	0.0	
Caliente Avenue NB				38.4
Caliente Avenue SB				37.1
Otay Mesa Road EB				45.2
Otay Mesa Road WB				45.4
SR-905 EB				52.9
SR-905 EB Off-Ramp				33.6
SR-905 EB On-Ramp				40.5
SR-905 WB				54.2
SR-905 WB Off-Ramp				43.9
SR-905 WB On-Ramp				32.4
127	1.Fl	58.1	0.0	
Caliente Avenue NB				36.9
Caliente Avenue SB				35.5
Otay Mesa Road EB				45.4
Otay Mesa Road WB				45.6
SR-905 EB				53.6
SR-905 EB Off-Ramp				31.1
SR-905 EB On-Ramp				40.9
SR-905 WB				54.8
SR-905 WB Off-Ramp				44.6
SR-905 WB On-Ramp				31.2
128	1.Fl	57.4	0.0	
Caliente Avenue NB				37.8
Caliente Avenue SB				35.9
Otay Mesa Road EB				44.9
Otay Mesa Road WB				45.4
SR-905 EB				52.7
SR-905 EB Off-Ramp				31.8
SR-905 EB On-Ramp				39.8
SR-905 WB				54.0
SR-905 WB Off-Ramp				43.5
SR-905 WB On-Ramp				31.2
129	1.Fl	57.8	0.0	
Caliente Avenue NB				37.7
Caliente Avenue SB				36.2
Otay Mesa Road EB				44.5
Otay Mesa Road WB				44.8
SR-905 EB				53.2
SR-905 EB Off-Ramp				33.2
SR-905 EB On-Ramp				40.6
SR-905 WB				54.5
SR-905 WB Off-Ramp				44.2
SR-905 WB On-Ramp				32.9
130	1.Fl	63.1	0.0	
Caliente Avenue NB				37.2
Caliente Avenue SB				36.1
Otay Mesa Road EB				44.1
Otay Mesa Road WB				44.5
SR-905 EB				58.5
SR-905 EB Off-Ramp				32.5
SR-905 EB On-Ramp				45.2

SR-905 WB				60.4
SR-905 WB Off-Ramp				50.7
SR-905 WB On-Ramp				33.1
131	1.Fl	63.6	0.0	
Caliente Avenue NB				38.3
Caliente Avenue SB				36.9
Otay Mesa Road EB				43.6
Otay Mesa Road WB				43.9
SR-905 EB				59.0
SR-905 EB Off-Ramp				31.6
SR-905 EB On-Ramp				45.5
SR-905 WB				60.9
SR-905 WB Off-Ramp				51.4
SR-905 WB On-Ramp				33.0
132	1.Fl	74.2	0.0	
Caliente Avenue NB				36.7
Caliente Avenue SB				36.3
Otay Mesa Road EB				42.3
Otay Mesa Road WB				41.9
SR-905 EB				69.6
SR-905 EB Off-Ramp				32.5
SR-905 EB On-Ramp				55.2
SR-905 WB				71.8
SR-905 WB Off-Ramp				61.8
SR-905 WB On-Ramp				32.3
133	1.Fl	73.6	0.0	
Caliente Avenue NB				44.7
Caliente Avenue SB				44.0
Otay Mesa Road EB				41.3
Otay Mesa Road WB				41.1
SR-905 EB				68.8
SR-905 EB Off-Ramp				40.6
SR-905 EB On-Ramp				54.7
SR-905 WB				71.3
SR-905 WB Off-Ramp				62.0
SR-905 WB On-Ramp				31.3
134	1.Fl	73.9	0.0	
Caliente Avenue NB				36.7
Caliente Avenue SB				35.8
Otay Mesa Road EB				41.1
Otay Mesa Road WB				40.8
SR-905 EB				69.3
SR-905 EB Off-Ramp				33.3
SR-905 EB On-Ramp				55.1
SR-905 WB				71.5
SR-905 WB Off-Ramp				61.8
SR-905 WB On-Ramp				31.9
135	1.Fl	73.5	0.0	
Caliente Avenue NB				45.5
Caliente Avenue SB				44.8
Otay Mesa Road EB				42.3
Otay Mesa Road WB				42.1
SR-905 EB				68.7
SR-905 EB Off-Ramp				41.7
SR-905 EB On-Ramp				54.6

SR-905 WB				71.1
SR-905 WB Off-Ramp				62.0
SR-905 WB On-Ramp				29.9
136	1.Fl	62.0	0.0	
Caliente Avenue NB				37.9
Caliente Avenue SB				36.2
Otay Mesa Road EB				44.0
Otay Mesa Road WB				44.0
SR-905 EB				57.4
SR-905 EB Off-Ramp				32.6
SR-905 EB On-Ramp				44.1
SR-905 WB				59.3
SR-905 WB Off-Ramp				49.6
SR-905 WB On-Ramp				30.6
137	1.Fl	60.4	0.0	
Caliente Avenue NB				38.5
Caliente Avenue SB				37.1
Otay Mesa Road EB				44.1
Otay Mesa Road WB				44.3
SR-905 EB				55.8
SR-905 EB Off-Ramp				32.8
SR-905 EB On-Ramp				42.9
SR-905 WB				57.5
SR-905 WB Off-Ramp				47.7
SR-905 WB On-Ramp				31.4
138	1.Fl	57.7	0.0	
Caliente Avenue NB				38.1
Caliente Avenue SB				37.1
Otay Mesa Road EB				44.4
Otay Mesa Road WB				44.7
SR-905 EB				53.0
SR-905 EB Off-Ramp				33.3
SR-905 EB On-Ramp				40.4
SR-905 WB				54.4
SR-905 WB Off-Ramp				44.1
SR-905 WB On-Ramp				31.3
139	1.Fl	57.2	0.0	
Caliente Avenue NB				38.4
Caliente Avenue SB				36.7
Otay Mesa Road EB				44.2
Otay Mesa Road WB				44.6
SR-905 EB				52.6
SR-905 EB Off-Ramp				32.0
SR-905 EB On-Ramp				39.3
SR-905 WB				53.8
SR-905 WB Off-Ramp				43.8
SR-905 WB On-Ramp				31.5
140	1.Fl	56.3	0.0	
Caliente Avenue NB				38.8
Caliente Avenue SB				37.2
Otay Mesa Road EB				44.3
Otay Mesa Road WB				44.6
SR-905 EB				51.7
SR-905 EB Off-Ramp				32.5
SR-905 EB On-Ramp				39.6

SR-905 WB				52.6
SR-905 WB Off-Ramp				42.7
SR-905 WB On-Ramp				31.4
141	1.Fl	58.3	0.0	
Caliente Avenue NB				38.0
Caliente Avenue SB				36.8
Otay Mesa Road EB				44.2
Otay Mesa Road WB				44.5
SR-905 EB				53.7
SR-905 EB Off-Ramp				34.3
SR-905 EB On-Ramp				41.4
SR-905 WB				55.1
SR-905 WB Off-Ramp				45.4
SR-905 WB On-Ramp				35.2
142	1.Fl	61.7	0.0	
Caliente Avenue NB				37.8
Caliente Avenue SB				36.7
Otay Mesa Road EB				44.0
Otay Mesa Road WB				44.3
SR-905 EB				57.2
SR-905 EB Off-Ramp				33.8
SR-905 EB On-Ramp				43.8
SR-905 WB				58.9
SR-905 WB Off-Ramp				49.2
SR-905 WB On-Ramp				35.1
143	1.Fl	63.0	0.0	
Caliente Avenue NB				40.0
Caliente Avenue SB				38.3
Otay Mesa Road EB				43.8
Otay Mesa Road WB				43.9
SR-905 EB				58.4
SR-905 EB Off-Ramp				33.3
SR-905 EB On-Ramp				45.1
SR-905 WB				60.4
SR-905 WB Off-Ramp				51.0
SR-905 WB On-Ramp				34.8
144	1.Fl	73.8	0.0	
Caliente Avenue NB				36.9
Caliente Avenue SB				36.2
Otay Mesa Road EB				41.6
Otay Mesa Road WB				41.4
SR-905 EB				69.1
SR-905 EB Off-Ramp				31.6
SR-905 EB On-Ramp				54.9
SR-905 WB				71.4
SR-905 WB Off-Ramp				62.1
SR-905 WB On-Ramp				34.3
145	1.Fl	73.2	0.0	
Caliente Avenue NB				46.4
Caliente Avenue SB				45.4
Otay Mesa Road EB				41.6
Otay Mesa Road WB				41.5
SR-905 EB				68.4
SR-905 EB Off-Ramp				42.0
SR-905 EB On-Ramp				54.1

SR-905 WB				70.7
SR-905 WB Off-Ramp				62.1
SR-905 WB On-Ramp				30.5
146	1.Fl	73.5	0.0	
Caliente Avenue NB				38.0
Caliente Avenue SB				37.1
Otay Mesa Road EB				40.9
Otay Mesa Road WB				40.7
SR-905 EB				68.8
SR-905 EB Off-Ramp				34.7
SR-905 EB On-Ramp				54.6
SR-905 WB				71.1
SR-905 WB Off-Ramp				62.1
SR-905 WB On-Ramp				36.5
147	1.Fl	73.1	0.0	
Caliente Avenue NB				46.8
Caliente Avenue SB				46.1
Otay Mesa Road EB				40.9
Otay Mesa Road WB				40.8
SR-905 EB				68.4
SR-905 EB Off-Ramp				42.6
SR-905 EB On-Ramp				54.0
SR-905 WB				70.7
SR-905 WB Off-Ramp				62.3
SR-905 WB On-Ramp				29.8
148	1.Fl	62.2	0.0	
Caliente Avenue NB				37.2
Caliente Avenue SB				36.1
Otay Mesa Road EB				43.1
Otay Mesa Road WB				43.3
SR-905 EB				57.7
SR-905 EB Off-Ramp				32.6
SR-905 EB On-Ramp				44.3
SR-905 WB				59.5
SR-905 WB Off-Ramp				50.8
SR-905 WB On-Ramp				31.9
149	1.Fl	60.1	0.0	
Caliente Avenue NB				37.7
Caliente Avenue SB				36.4
Otay Mesa Road EB				43.7
Otay Mesa Road WB				43.8
SR-905 EB				55.4
SR-905 EB Off-Ramp				33.6
SR-905 EB On-Ramp				42.5
SR-905 WB				57.3
SR-905 WB Off-Ramp				47.8
SR-905 WB On-Ramp				32.5
150	1.Fl	57.4	0.0	
Caliente Avenue NB				38.0
Caliente Avenue SB				36.3
Otay Mesa Road EB				43.8
Otay Mesa Road WB				44.0
SR-905 EB				52.8
SR-905 EB Off-Ramp				32.8
SR-905 EB On-Ramp				40.3

SR-905 WB				54.1
SR-905 WB Off-Ramp				44.4
SR-905 WB On-Ramp				30.4
151	1.Fl	56.8	0.0	
Caliente Avenue NB				40.1
Caliente Avenue SB				38.6
Otay Mesa Road EB				43.6
Otay Mesa Road WB				44.0
SR-905 EB				52.1
SR-905 EB Off-Ramp				32.2
SR-905 EB On-Ramp				39.6
SR-905 WB				53.2
SR-905 WB Off-Ramp				43.5
SR-905 WB On-Ramp				31.6
152	1.Fl	57.9	0.0	
Caliente Avenue NB				40.1
Caliente Avenue SB				38.2
Otay Mesa Road EB				43.9
Otay Mesa Road WB				44.1
SR-905 EB				53.3
SR-905 EB Off-Ramp				31.8
SR-905 EB On-Ramp				40.1
SR-905 WB				54.6
SR-905 WB Off-Ramp				45.2
SR-905 WB On-Ramp				31.8
153	1.Fl	58.3	0.0	
Caliente Avenue NB				39.6
Caliente Avenue SB				38.6
Otay Mesa Road EB				44.4
Otay Mesa Road WB				44.7
SR-905 EB				53.9
SR-905 EB Off-Ramp				37.2
SR-905 EB On-Ramp				40.4
SR-905 WB				54.8
SR-905 WB Off-Ramp				44.9
SR-905 WB On-Ramp				36.9
154	1.Fl	63.0	0.0	
Caliente Avenue NB				39.5
Caliente Avenue SB				38.5
Otay Mesa Road EB				44.0
Otay Mesa Road WB				44.5
SR-905 EB				58.4
SR-905 EB Off-Ramp				36.0
SR-905 EB On-Ramp				44.9
SR-905 WB				60.3
SR-905 WB Off-Ramp				51.3
SR-905 WB On-Ramp				37.3
155	1.Fl	63.4	0.0	
Caliente Avenue NB				42.4
Caliente Avenue SB				40.9
Otay Mesa Road EB				43.5
Otay Mesa Road WB				43.7
SR-905 EB				58.8
SR-905 EB Off-Ramp				35.0
SR-905 EB On-Ramp				45.4

SR-905 WB				60.7
SR-905 WB Off-Ramp				51.9
SR-905 WB On-Ramp				37.3
156	1.Fl	73.3	0.0	
Caliente Avenue NB				40.9
Caliente Avenue SB				40.3
Otay Mesa Road EB				41.3
Otay Mesa Road WB				41.4
SR-905 EB				68.6
SR-905 EB Off-Ramp				33.1
SR-905 EB On-Ramp				54.4
SR-905 WB				70.9
SR-905 WB Off-Ramp				62.4
SR-905 WB On-Ramp				37.0
157	1.Fl	72.8	0.0	
Caliente Avenue NB				48.3
Caliente Avenue SB				47.2
Otay Mesa Road EB				40.3
Otay Mesa Road WB				40.3
SR-905 EB				68.1
SR-905 EB Off-Ramp				43.6
SR-905 EB On-Ramp				53.6
SR-905 WB				70.3
SR-905 WB Off-Ramp				62.4
SR-905 WB On-Ramp				31.1
158	1.Fl	63.4	0.0	
Caliente Avenue NB				45.3
Caliente Avenue SB				44.2
Otay Mesa Road EB				45.0
Otay Mesa Road WB				45.5
SR-905 EB				58.9
SR-905 EB Off-Ramp				38.5
SR-905 EB On-Ramp				44.4
SR-905 WB				60.4
SR-905 WB Off-Ramp				51.7
SR-905 WB On-Ramp				42.1
159	1.Fl	72.6	0.0	
Caliente Avenue NB				40.4
Caliente Avenue SB				39.3
Otay Mesa Road EB				42.5
Otay Mesa Road WB				42.7
SR-905 EB				67.8
SR-905 EB Off-Ramp				33.3
SR-905 EB On-Ramp				53.6
SR-905 WB				70.1
SR-905 WB Off-Ramp				61.9
SR-905 WB On-Ramp				38.1
160	1.Fl	69.7	0.0	
Caliente Avenue NB				43.7
Caliente Avenue SB				41.8
Otay Mesa Road EB				41.9
Otay Mesa Road WB				41.7
SR-905 EB				65.0
SR-905 EB Off-Ramp				36.3
SR-905 EB On-Ramp				50.9

SR-905 WB				67.2
SR-905 WB Off-Ramp				59.0
SR-905 WB On-Ramp				33.9
161	1.Fl	69.7	0.0	
Caliente Avenue NB				43.6
Caliente Avenue SB				41.9
Otay Mesa Road EB				39.8
Otay Mesa Road WB				39.5
SR-905 EB				65.1
SR-905 EB Off-Ramp				37.8
SR-905 EB On-Ramp				51.0
SR-905 WB				67.2
SR-905 WB Off-Ramp				58.9
SR-905 WB On-Ramp				34.2
162	1.Fl	67.2	0.0	
Caliente Avenue NB				52.1
Caliente Avenue SB				51.2
Otay Mesa Road EB				49.8
Otay Mesa Road WB				48.5
SR-905 EB				62.1
SR-905 EB Off-Ramp				44.3
SR-905 EB On-Ramp				45.6
SR-905 WB				64.1
SR-905 WB Off-Ramp				56.9
SR-905 WB On-Ramp				47.0
163	1.Fl	65.5	0.0	
Caliente Avenue NB				52.3
Caliente Avenue SB				51.6
Otay Mesa Road EB				53.2
Otay Mesa Road WB				51.9
SR-905 EB				60.4
SR-905 EB Off-Ramp				43.7
SR-905 EB On-Ramp				43.2
SR-905 WB				61.8
SR-905 WB Off-Ramp				52.4
SR-905 WB On-Ramp				47.4
164	1.Fl	60.3	0.0	
Caliente Avenue NB				45.4
Caliente Avenue SB				44.4
Otay Mesa Road EB				49.3
Otay Mesa Road WB				47.7
SR-905 EB				55.2
SR-905 EB Off-Ramp				32.7
SR-905 EB On-Ramp				41.9
SR-905 WB				56.7
SR-905 WB Off-Ramp				46.9
SR-905 WB On-Ramp				35.3
165	1.Fl	57.9	0.0	
Caliente Avenue NB				43.6
Caliente Avenue SB				42.1
Otay Mesa Road EB				44.3
Otay Mesa Road WB				44.3
SR-905 EB				53.8
SR-905 EB Off-Ramp				35.3
SR-905 EB On-Ramp				39.9

SR-905 WB				53.7
SR-905 WB Off-Ramp				44.4
SR-905 WB On-Ramp				34.0
166	1.Fl	62.8	0.0	
Caliente Avenue NB				43.3
Caliente Avenue SB				42.4
Otay Mesa Road EB				48.1
Otay Mesa Road WB				47.9
SR-905 EB				58.4
SR-905 EB Off-Ramp				39.1
SR-905 EB On-Ramp				44.4
SR-905 WB				59.6
SR-905 WB Off-Ramp				50.6
SR-905 WB On-Ramp				38.4
167	1.Fl	67.5	0.0	
Caliente Avenue NB				43.9
Caliente Avenue SB				43.1
Otay Mesa Road EB				44.2
Otay Mesa Road WB				44.4
SR-905 EB				63.1
SR-905 EB Off-Ramp				39.5
SR-905 EB On-Ramp				49.2
SR-905 WB				64.7
SR-905 WB Off-Ramp				55.8
SR-905 WB On-Ramp				41.5
168	1.Fl	59.5	0.0	
Caliente Avenue NB				43.6
Caliente Avenue SB				42.7
Otay Mesa Road EB				53.4
Otay Mesa Road WB				52.4
SR-905 EB				53.0
SR-905 EB Off-Ramp				38.1
SR-905 EB On-Ramp				39.0
SR-905 WB				53.4
SR-905 WB Off-Ramp				42.5
SR-905 WB On-Ramp				36.6
169	1.Fl	65.4	0.0	
Caliente Avenue NB				44.2
Caliente Avenue SB				43.5
Otay Mesa Road EB				49.8
Otay Mesa Road WB				49.3
SR-905 EB				61.0
SR-905 EB Off-Ramp				39.2
SR-905 EB On-Ramp				47.1
SR-905 WB				62.4
SR-905 WB Off-Ramp				53.2
SR-905 WB On-Ramp				40.8
170	1.Fl	60.6	0.0	
Caliente Avenue NB				41.1
Caliente Avenue SB				39.9
Otay Mesa Road EB				45.3
Otay Mesa Road WB				45.0
SR-905 EB				56.0
SR-905 EB Off-Ramp				34.0
SR-905 EB On-Ramp				42.3

SR-905 WB				57.5
SR-905 WB Off-Ramp				48.4
SR-905 WB On-Ramp				33.8
171	1.Fl	57.8	0.0	
Caliente Avenue NB				43.7
Caliente Avenue SB				43.2
Otay Mesa Road EB				48.7
Otay Mesa Road WB				47.2
SR-905 EB				52.3
SR-905 EB Off-Ramp				35.5
SR-905 EB On-Ramp				39.0
SR-905 WB				53.3
SR-905 WB Off-Ramp				43.7
SR-905 WB On-Ramp				37.0
172	1.Fl	60.4	0.0	
Caliente Avenue NB				46.4
Caliente Avenue SB				45.6
Otay Mesa Road EB				50.3
Otay Mesa Road WB				49.6
SR-905 EB				55.6
SR-905 EB Off-Ramp				38.5
SR-905 EB On-Ramp				39.6
SR-905 WB				55.8
SR-905 WB Off-Ramp				46.5
SR-905 WB On-Ramp				35.7
173	1.Fl	65.2	0.0	
Caliente Avenue NB				52.4
Caliente Avenue SB				51.9
Otay Mesa Road EB				55.2
Otay Mesa Road WB				53.9
SR-905 EB				59.5
SR-905 EB Off-Ramp				43.4
SR-905 EB On-Ramp				42.3
SR-905 WB				61.3
SR-905 WB Off-Ramp				50.7
SR-905 WB On-Ramp				47.3

ATTACHMENT 7

FHWA RD-77-108 – Off-Site Traffic Noise

FHWA RD-77-108

Traffic Noise Prediction Model

Data Input Sheet

Project Name : California Terraces PA 61
Project Number : 4135.1
Modeled Condition : Existing, Existing + Project

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
EXISTING												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	12,963	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	10,919	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	10,048	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	9,591	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	11,405	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	20,951	30	50	88.70	5.10	6.20	80.00	10.00	10.00	
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	14,288	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	7,947	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	16,330	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
10	Otay Mesa Road	Driveway to Emerald Crest Court	16,330	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	15,855	50	50	88.70	5.10	6.20	80.00	10.00	10.00	
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	10,499	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
13	Otay Mesa Road	Innovative Drive to Heritage Road	11,864	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
EXISTING + PROJECT												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	13,765	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	11,768	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	11,651	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	11,383	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	13,433	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	22,130	30	50	88.70	5.10	6.20	80.00	10.00	10.00	
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	14,995	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	8,183	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	21,306	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
10	Otay Mesa Road	Driveway to Emerald Crest Court	20,624	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	17,034	50	50	88.70	5.10	6.20	80.00	10.00	10.00	
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	11,442	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
13	Otay Mesa Road	Innovative Drive to Heritage Road	12,807	45	50	88.70	5.10	6.20	80.00	10.00	10.00	

FHWA RD-77-108

Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : California Terraces PA 61
Project Number : 4135.1
Modeled Condition : Existing, Existing + Project
Assessment Metric: Hard

			Noise Levels, dBA Hard					Distance to Traffic Noise Level Contours, Feet			
Segment	Roadway	Segment	Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
EXISTING												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	66.4	62.9	68.6	71.3	21	67	213	674	2,133	6,745
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	65.6	62.2	67.8	70.6	18	57	182	574	1,815	5,741
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	65.3	61.8	67.5	70.2	17	52	166	524	1,656	5,236
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	65.1	61.6	67.3	70.0	16	50	158	500	1,581	5,000
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	67.3	63.1	68.5	71.6	23	72	229	723	2,285	7,227
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	64.9	63.0	71.0	72.5	28	89	281	889	2,812	8,891
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	66.8	63.3	69.0	71.7	23	74	234	740	2,339	7,396
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	64.3	60.8	66.5	69.2	13	42	132	416	1,315	4,159
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	71.4	66.1	70.9	74.8	48	151	477	1,510	4,775	15,100
10	Otay Mesa Road	Driveway to Emerald Crest Court	71.4	66.1	70.9	74.8	48	151	477	1,510	4,775	15,100
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	70.0	65.3	70.3	73.9	39	123	388	1,227	3,881	12,274
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	66.9	62.8	68.1	71.3	21	67	213	674	2,133	6,745
13	Otay Mesa Road	Innovative Drive to Heritage Road	67.5	63.3	68.7	71.8	24	76	239	757	2,393	7,568
EXISTING + PROJECT												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	66.6	63.2	68.8	71.6	23	72	229	723	2,285	7,227
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	66.0	62.5	68.2	70.9	19	62	195	615	1,945	6,151
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	65.9	62.4	68.1	70.8	19	60	190	601	1,901	6,011
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	65.8	62.3	68.0	70.7	19	59	186	587	1,858	5,874
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	68.0	63.9	69.2	72.3	27	85	269	849	2,685	8,491
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	65.1	63.3	71.2	72.7	29	93	294	931	2,944	9,310
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	67.0	63.5	69.2	71.9	24	77	245	774	2,449	7,744
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	64.4	60.9	66.6	69.3	13	43	135	426	1,346	4,256
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	72.5	67.2	72.0	75.9	62	195	615	1,945	6,151	19,452
10	Otay Mesa Road	Driveway to Emerald Crest Court	72.4	67.1	71.9	75.8	60	190	601	1,901	6,011	19,009
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	70.4	65.6	70.7	74.2	42	132	416	1,315	4,159	13,151
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	67.3	63.2	68.5	71.6	23	72	229	723	2,285	7,227
13	Otay Mesa Road	Innovative Drive to Heritage Road	67.8	63.6	69.0	72.1	26	81	256	811	2,564	8,109

FHWA RD-77-108

Traffic Noise Prediction Model

Data Input Sheet

Project Name : California Terraces PA 61
Project Number : 4135.1
Modeled Condition : Near-Term, Near-Term + Project

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
NEAR-TERM (EXISTING + CUMULATIVE)												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	15,647	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	13,878	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	12,380	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	13,496	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	15,774	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	27,366	30	50	88.70	5.10	6.20	80.00	10.00	10.00	
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	21,646	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	16,163	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	25,607	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
10	Otay Mesa Road	Driveway to Emerald Crest Court	25,607	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	23,059	50	50	88.70	5.10	6.20	80.00	10.00	10.00	
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	15,632	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
13	Otay Mesa Road	Innovative Drive to Heritage Road	16,979	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
NEAR-TERM + PROJECT												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	16,449	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	14,727	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	13,983	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	15,288	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	17,802	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	28,545	30	50	88.70	5.10	6.20	80.00	10.00	10.00	
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	22,353	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	16,399	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	30,583	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
10	Otay Mesa Road	Driveway to Emerald Crest Court	29,901	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	24,238	50	50	88.70	5.10	6.20	80.00	10.00	10.00	
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	16,575	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
13	Otay Mesa Road	Innovative Drive to Heritage Road	17,922	45	50	88.70	5.10	6.20	80.00	10.00	10.00	

FHWA RD-77-108

Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : California Terraces PA 61
Project Number : 4135.1
Modeled Condition : Near-Term, Near-Term + Project
Assessment Metric: Hard

			Noise Levels, dBA Hard				Distance to Traffic Noise Level Contours, Feet					
Segment	Roadway	Segment	Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
NEAR-TERM (EXISTING + CUMULATIVE)												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	67.2	63.7	69.4	72.1	26	81	256	811	2,564	8,109
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	66.7	63.2	68.9	71.6	23	72	229	723	2,285	7,227
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	66.2	62.7	68.4	71.1	20	64	204	644	2,037	6,441
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	66.6	63.1	68.8	71.5	22	71	223	706	2,233	7,063
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	68.7	64.6	69.9	73.0	32	100	315	998	3,155	9,976
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	66.0	64.2	72.2	73.6	36	115	362	1,145	3,622	11,454
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	68.6	65.1	70.8	73.5	35	112	354	1,119	3,540	11,194
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	67.3	63.9	69.5	72.3	27	85	269	849	2,685	8,491
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	73.3	68.0	72.8	76.7	74	234	740	2,339	7,396	23,387
10	Otay Mesa Road	Driveway to Emerald Crest Court	73.3	68.0	72.8	76.7	74	234	740	2,339	7,396	23,387
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	71.7	66.9	72.0	75.5	56	177	561	1,774	5,610	17,741
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	68.7	64.5	69.9	73.0	32	100	315	998	3,155	9,976
13	Otay Mesa Road	Innovative Drive to Heritage Road	69.0	64.9	70.2	73.3	34	107	338	1,069	3,380	10,690
NEAR-TERM + PROJECT												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	67.4	63.9	69.6	72.3	27	85	269	849	2,685	8,491
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	66.9	63.5	69.1	71.9	24	77	245	774	2,449	7,744
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	66.7	63.2	68.9	71.6	23	72	229	723	2,285	7,227
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	67.1	63.6	69.3	72.0	25	79	251	792	2,506	7,924
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	69.2	65.1	70.4	73.5	35	112	354	1,119	3,540	11,194
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	66.2	64.4	72.4	73.8	38	120	379	1,199	3,793	11,994
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	68.7	65.3	70.9	73.7	37	117	371	1,172	3,707	11,721
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	67.4	63.9	69.6	72.3	27	85	269	849	2,685	8,491
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	74.1	68.8	73.6	77.5	89	281	889	2,812	8,891	28,117
10	Otay Mesa Road	Driveway to Emerald Crest Court	74.0	68.7	73.5	77.4	87	275	869	2,748	8,689	27,477
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	71.9	67.1	72.2	75.7	59	186	587	1,858	5,874	18,577
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	68.9	64.8	70.1	73.2	33	104	330	1,045	3,303	10,446
13	Otay Mesa Road	Innovative Drive to Heritage Road	69.3	65.1	70.5	73.6	36	115	362	1,145	3,622	11,454

FHWA RD-77-108

Traffic Noise Prediction Model

Data Input Sheet

Project Name : California Terraces PA 61
Project Number : 4135.1
Modeled Condition : Horizon, Horizon + Project

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
HORIZON YEAR (2062)												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	19,900	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	17,800	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	17,800	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	17,000	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	18,300	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	38,000	30	50	88.70	5.10	6.20	80.00	10.00	10.00	
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	33,200	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	32,000	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	39,700	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
10	Otay Mesa Road	Driveway to Emerald Crest Court	39,700	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	36,900	50	50	88.70	5.10	6.20	80.00	10.00	10.00	
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	20,200	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
13	Otay Mesa Road	Innovative Drive to Heritage Road	22,800	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
HORIZON YEAR (2062) + PROJECT												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	20,702	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	18,649	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	19,403	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	18,792	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	20,328	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	39,179	30	50	88.70	5.10	6.20	80.00	10.00	10.00	
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	33,907	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	32,236	40	50	88.70	5.10	6.20	80.00	10.00	10.00	
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	44,676	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
10	Otay Mesa Road	Driveway to Emerald Crest Court	43,994	55	50	88.70	5.10	6.20	80.00	10.00	10.00	
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	38,079	50	50	88.70	5.10	6.20	80.00	10.00	10.00	
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	21,143	45	50	88.70	5.10	6.20	80.00	10.00	10.00	
13	Otay Mesa Road	Innovative Drive to Heritage Road	23,743	45	50	88.70	5.10	6.20	80.00	10.00	10.00	

FHWA RD-77-108

Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : California Terraces PA 61
Project Number : 4135.1
Modeled Condition : Horizon, Horizon + Project
Assessment Metric: Hard

			Noise Levels, dBA Hard				Distance to Traffic Noise Level Contours, Feet					
Segment	Roadway	Segment	Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
HORIZON YEAR (2062)												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	68.2	64.8	70.4	73.2	33	104	330	1,045	3,303	10,446
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	67.8	64.3	70.0	72.7	29	93	294	931	2,944	9,310
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	67.8	64.3	70.0	72.7	29	93	294	931	2,944	9,310
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	67.6	64.1	69.8	72.5	28	89	281	889	2,812	8,891
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	69.4	65.2	70.5	73.7	37	117	371	1,172	3,707	11,721
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	67.5	65.6	73.6	75.1	51	162	512	1,618	5,116	16,180
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	70.5	67.0	72.7	75.4	55	173	548	1,734	5,482	17,337
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	70.3	66.8	72.5	75.2	52	166	524	1,656	5,236	16,557
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	75.2	69.9	74.7	78.6	115	362	1,145	3,622	11,454	36,222
10	Otay Mesa Road	Driveway to Emerald Crest Court	75.2	69.9	74.7	78.6	115	362	1,145	3,622	11,454	36,222
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	73.7	69.0	74.0	77.5	89	281	889	2,812	8,891	28,117
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	69.8	65.6	71.0	74.1	41	129	406	1,285	4,064	12,852
13	Otay Mesa Road	Innovative Drive to Heritage Road	70.3	66.2	71.5	74.6	46	144	456	1,442	4,560	14,420
HORIZON YEAR (2062) + PROJECT												
1	Ocean View Hills Parkway	Starfish Way to Sea Drift Way	68.4	64.9	70.6	73.3	34	107	338	1,069	3,380	10,690
2	Ocean View Hills Parkway	Sea Drift Way to Del Sol Boulevard	68.0	64.5	70.2	72.9	31	97	308	975	3,083	9,749
3	Ocean View Hills Parkway	Del Sol Boulevard to Sea Fire Point	68.1	64.7	70.3	73.1	32	102	323	1,021	3,228	10,209
4	Ocean View Hills Parkway	Sea Fire Point to Hidden Trails Road	68.0	64.5	70.2	72.9	31	97	308	975	3,083	9,749
5	Ocean View Hills Parkway	Hidden Trails Road to Otay Mesa Road	69.8	65.7	71.0	74.1	41	129	406	1,285	4,064	12,852
6	Caliente Avenue	Otay Mesa Road to SR-905 Westbound Ramps	67.6	65.8	73.7	75.2	52	166	524	1,656	5,236	16,557
7	Caliente Avenue	SR-905 Westbound Ramps to SR-905 Eastbound Ramps	70.6	67.1	72.8	75.5	56	177	561	1,774	5,610	17,741
8	Caliente Avenue	SR-905 Eastbound Ramps to Airway Road	70.3	66.9	72.5	75.3	54	169	536	1,694	5,358	16,942
9	Otay Mesa Road	Ocean View Hills Parkway to Driveway	75.7	70.4	75.2	79.1	129	406	1,285	4,064	12,852	40,642
10	Otay Mesa Road	Driveway to Emerald Crest Court	75.7	70.4	75.2	79.1	129	406	1,285	4,064	12,852	40,642
11	Otay Mesa Road	Emerald Crest Court to Corporate Center Drive	73.9	69.1	74.1	77.7	93	294	931	2,944	9,310	29,442
12	Otay Mesa Road	Corporate Center Drive to Innovative Drive	70.0	65.8	71.2	74.3	43	135	426	1,346	4,256	13,458
13	Otay Mesa Road	Innovative Drive to Heritage Road	70.5	66.3	71.7	74.8	48	151	477	1,510	4,775	15,100

ATTACHMENT 8

SoundPLAN Data – HVAC

4135.1 California Terraces PA-61
SoundPLAN Data - HVAC

Source name	Reference	Level Leq1 dB(A)	Corrections Kwall dB(A)	CI dB(A)	CT dB(A)
HVAC1	Unit	72	-	-	-
HVAC2	Unit	72	-	-	-
HVAC3	Unit	72	-	-	-
HVAC4	Unit	72	-	-	-
HVAC5	Unit	72	-	-	-
HVAC6	Unit	72	-	-	-
HVAC7	Unit	72	-	-	-
HVAC8	Unit	72	-	-	-
HVAC9	Unit	72	-	-	-
HVAC10	Unit	72	-	-	-
HVAC11	Unit	72	-	-	-
HVAC12	Unit	72	-	-	-
HVAC13	Unit	72	-	-	-
HVAC14	Unit	72	-	-	-
HVAC15	Unit	72	-	-	-
HVAC16	Unit	72	-	-	-
HVAC17	Unit	72	-	-	-
HVAC18	Unit	72	-	-	-
HVAC19	Unit	72	-	-	-
HVAC20	Unit	72	-	-	-
HVAC21	Unit	72	-	-	-
HVAC22	Unit	72	-	-	-
HVAC23	Unit	72	-	-	-
HVAC24	Unit	72	-	-	-
HVAC25	Unit	72	-	-	-
HVAC26	Unit	72	-	-	-
HVAC27	Unit	72	-	-	-
HVAC28	Unit	72	-	-	-
HVAC29	Unit	72	-	-	-
HVAC30	Unit	72	-	-	-
HVAC31	Unit	72	-	-	-
HVAC32	Unit	72	-	-	-
HVAC33	Unit	72	-	-	-
HVAC34	Unit	72	-	-	-
HVAC35	Unit	72	-	-	-
HVAC36	Unit	72	-	-	-
HVAC37	Unit	72	-	-	-
HVAC38	Unit	72	-	-	-
HVAC39	Unit	72	-	-	-
HVAC40	Unit	72	-	-	-
HVAC41	Unit	72	-	-	-
HVAC42	Unit	72	-	-	-
HVAC43	Unit	72	-	-	-
HVAC44	Unit	72	-	-	-
HVAC45	Unit	72	-	-	-
HVAC46	Unit	72	-	-	-
HVAC47	Unit	72	-	-	-
HVAC48	Unit	72	-	-	-
HVAC49	Unit	72	-	-	-
HVAC50	Unit	72	-	-	-
HVAC51	Unit	72	-	-	-
HVAC52	Unit	72	-	-	-

HVAC53	Unit	72	-	-	-
HVAC54	Unit	72	-	-	-
HVAC55	Unit	72	-	-	-
HVAC56	Unit	72	-	-	-
HVAC57	Unit	72	-	-	-
HVAC58	Unit	72	-	-	-
HVAC59	Unit	72	-	-	-
HVAC60	Unit	72	-	-	-
HVAC61	Unit	72	-	-	-
HVAC62	Unit	72	-	-	-
HVAC63	Unit	72	-	-	-
HVAC64	Unit	72	-	-	-
HVAC65	Unit	72	-	-	-
HVAC66	Unit	72	-	-	-
HVAC67	Unit	72	-	-	-
HVAC68	Unit	72	-	-	-
HVAC69	Unit	72	-	-	-
HVAC70	Unit	72	-	-	-
HVAC71	Unit	72	-	-	-
HVAC72	Unit	72	-	-	-
HVAC73	Unit	72	-	-	-
HVAC74	Unit	72	-	-	-
HVAC75	Unit	72	-	-	-
HVAC76	Unit	72	-	-	-
HVAC77	Unit	72	-	-	-
HVAC78	Unit	72	-	-	-
HVAC79	Unit	72	-	-	-
HVAC80	Unit	72	-	-	-
HVAC81	Unit	72	-	-	-
HVAC82	Unit	72	-	-	-
HVAC83	Unit	72	-	-	-
HVAC84	Unit	72	-	-	-
HVAC85	Unit	72	-	-	-
HVAC86	Unit	72	-	-	-
HVAC87	Unit	72	-	-	-
HVAC88	Unit	72	-	-	-
HVAC89	Unit	72	-	-	-
HVAC90	Unit	72	-	-	-
HVAC91	Unit	72	-	-	-
HVAC92	Unit	72	-	-	-
HVAC93	Unit	72	-	-	-
HVAC94	Unit	72	-	-	-
HVAC95	Unit	72	-	-	-
HVAC96	Unit	72	-	-	-
HVAC97	Unit	72	-	-	-
HVAC98	Unit	72	-	-	-
HVAC99	Unit	72	-	-	-
HVAC100	Unit	72	-	-	-
HVAC101	Unit	72	-	-	-
HVAC102	Unit	72	-	-	-
HVAC103	Unit	72	-	-	-
HVAC104	Unit	72	-	-	-
HVAC105	Unit	72	-	-	-
HVAC106	Unit	72	-	-	-
HVAC107	Unit	72	-	-	-

HVAC108	Unit	72	-	-	-
HVAC109	Unit	72	-	-	-
HVAC110	Unit	72	-	-	-
HVAC111	Unit	72	-	-	-
HVAC112	Unit	72	-	-	-
HVAC113	Unit	72	-	-	-
HVAC114	Unit	72	-	-	-
HVAC115	Unit	72	-	-	-
HVAC116	Unit	72	-	-	-
HVAC117	Unit	72	-	-	-
HVAC118	Unit	72	-	-	-
HVAC119	Unit	72	-	-	-
HVAC120	Unit	72	-	-	-
HVAC121	Unit	72	-	-	-
HVAC122	Unit	72	-	-	-
HVAC123	Unit	72	-	-	-
HVAC124	Unit	72	-	-	-
HVAC125	Unit	72	-	-	-
HVAC126	Unit	72	-	-	-
HVAC127	Unit	72	-	-	-
HVAC128	Unit	72	-	-	-
HVAC129	Unit	72	-	-	-
HVAC130	Unit	72	-	-	-
HVAC131	Unit	72	-	-	-
HVAC132	Unit	72	-	-	-
HVAC133	Unit	72	-	-	-
HVAC134	Unit	72	-	-	-
HVAC135	Unit	72	-	-	-
HVAC136	Unit	72	-	-	-
HVAC137	Unit	72	-	-	-
HVAC138	Unit	72	-	-	-
HVAC139	Unit	72	-	-	-
HVAC140	Unit	72	-	-	-
HVAC141	Unit	72	-	-	-
HVAC142	Unit	72	-	-	-
HVAC143	Unit	72	-	-	-
HVAC144	Unit	72	-	-	-
HVAC145	Unit	72	-	-	-
HVAC146	Unit	72	-	-	-
HVAC147	Unit	72	-	-	-
HVAC148	Unit	72	-	-	-
HVAC149	Unit	72	-	-	-
HVAC150	Unit	72	-	-	-
HVAC151	Unit	72	-	-	-
HVAC152	Unit	72	-	-	-
HVAC153	Unit	72	-	-	-
HVAC154	Unit	72	-	-	-
HVAC155	Unit	72	-	-	-
HVAC156	Unit	72	-	-	-
HVAC157	Unit	72	-	-	-
HVAC158	Unit	72	-	-	-
HVAC159	Unit	72	-	-	-
HVAC160	Unit	72	-	-	-
HVAC161	Unit	72	-	-	-
HVAC162	Unit	72	-	-	-

HVAC163	Unit	72	-	-	-
HVAC164	Unit	72	-	-	-
HVAC165	Unit	72	-	-	-
HVAC166	Unit	72	-	-	-
HVAC167	Unit	72	-	-	-
HVAC168	Unit	72	-	-	-
HVAC169	Unit	72	-	-	-
HVAC170	Unit	72	-	-	-
HVAC171	Unit	72	-	-	-
HVAC172	Unit	72	-	-	-
HVAC173	Unit	72	-	-	-

4135.1 California Terraces PA-61
SoundPLAN Data - HVAC

No.	Coordinates X	Y	Floor	Height	Limit Leq1	Level w/o NP Leq1	Level w. NP Leq1	Difference Leq1	Conflict Leq1
	in meter			m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
1	499074.90	3603253.79	1.Fl	160.65	-	34.7	0	-34.7	-
2	499074.93	3603286.49	1.Fl	162.04	-	35.6	0	-35.6	-
3	499074.97	3603333.00	1.Fl	161.47	-	36.9	0	-36.9	-
4	499075.05	3603406.30	1.Fl	160.35	-	34.8	0	-34.8	-
5	499051.71	3603448.75	1.Fl	160.61	-	36.6	0	-36.6	-
6	498987.28	3603449.21	1.Fl	161.42	-	38.1	0	-38.1	-
7	498929.26	3603451.69	1.Fl	162.25	-	38.1	0	-38.1	-
8	498881.59	3603456.01	1.Fl	162.23	-	37.4	0	-37.4	-
9	498842.85	3603460.83	1.Fl	161.79	-	36.2	0	-36.2	-
10	498795.66	3603463.58	1.Fl	161.27	-	34.6	0	-34.6	-
11	498719.81	3603466.46	1.Fl	160.61	-	32.8	0	-32.8	-
12	498689.33	3603406.53	1.Fl	161.21	-	32.6	0	-32.6	-
13	498689.37	3603365.41	1.Fl	161.83	-	33.0	0	-33.0	-
14	498685.46	3603294.52	1.Fl	164.57	-	33.6	0	-33.6	-
15	498762.73	3603264.97	1.Fl	162.79	-	34.8	0	-34.8	-
16	498820.55	3603248.62	1.Fl	162.75	-	35.2	0	-35.2	-
17	498873.13	3603251.73	1.Fl	162.48	-	37.6	0	-37.6	-
18	498928.41	3603252.34	1.Fl	162.14	-	38.2	0	-38.2	-
19	498980.21	3603252.61	1.Fl	161.65	-	37.8	0	-37.8	-
20	499028.95	3603252.87	1.Fl	161.04	-	37.4	0	-37.4	-

Source name			Level w/o NP Leq1 dB(A)	Level w. NP Leq1 dB(A)
1	1.Fl	34.7	0.0	
HVAC1			7.2	0
HVAC2			7.0	0
HVAC3			7.0	0
HVAC4			7.4	0
HVAC5			7.5	0
HVAC6			11.2	0
HVAC7			11.4	0
HVAC8			11.0	0
HVAC9			11.0	0
HVAC10			10.9	0
HVAC11			11.6	0
HVAC12			11.6	0
HVAC13			11.2	0
HVAC14			11.0	0
HVAC15			10.6	0
HVAC16			0.7	0
HVAC17			1.8	0
HVAC18			3.3	0
HVAC19			3.3	0
HVAC20			3.0	0
HVAC21			-1.3	0
HVAC22			-1.4	0
HVAC23			-1.7	0
HVAC24			-1.7	0
HVAC25			-1.7	0
HVAC26			13.6	0
HVAC27			13.6	0
HVAC28			11.7	0
HVAC29			11.8	0
HVAC30			10.5	0
HVAC31			10.1	0
HVAC32			8.9	0
HVAC33			10.4	0
HVAC34			13.9	0
HVAC35			13.8	0
HVAC36			12.5	0
HVAC37			9.9	0
HVAC38			9.0	0
HVAC39			8.9	0
HVAC40			12.9	0
HVAC41			12.9	0
HVAC42			11.4	0
HVAC43			10.7	0
HVAC44			10.6	0
HVAC45			10.3	0
HVAC46			12.1	0
HVAC47			12.1	0
HVAC48			12.1	0
HVAC49			8.9	0
HVAC50			16.2	0
HVAC51			16.4	0

HVAC52	15.7	0
HVAC53	11.9	0
HVAC54	10.9	0
HVAC55	9.7	0
HVAC56	16.8	0
HVAC57	16.8	0
HVAC58	13.7	0
HVAC59	12.8	0
HVAC60	12.1	0
HVAC61	12.3	0
HVAC62	24.0	0
HVAC63	24.4	0
HVAC64	16.6	0
HVAC65	14.4	0
HVAC66	13.3	0
HVAC67	11.8	0
HVAC68	23.2	0
HVAC69	24.1	0
HVAC70	24.7	0
HVAC71	20.8	0
HVAC72	15.7	0
HVAC73	21.5	0
HVAC74	6.2	0
HVAC75	6.1	0
HVAC76	6.5	0
HVAC77	6.7	0
HVAC78	7.0	0
HVAC79	7.5	0
HVAC80	3.6	0
HVAC81	3.7	0
HVAC82	4.0	0
HVAC83	4.1	0
HVAC84	4.2	0
HVAC85	4.1	0
HVAC86	6.2	0
HVAC87	6.2	0
HVAC88	6.1	0
HVAC89	6.1	0
HVAC90	6.0	0
HVAC91	3.5	0
HVAC92	4.5	0
HVAC93	4.6	0
HVAC94	6.7	0
HVAC95	6.5	0
HVAC96	6.4	0
HVAC97	6.1	0
HVAC98	2.3	0
HVAC99	2.3	0
HVAC100	2.2	0
HVAC101	0.1	0
HVAC102	-0.1	0
HVAC103	-0.4	0
HVAC104	0.8	0
HVAC105	0.8	0
HVAC106	0.7	0

HVAC107	0.5	0
HVAC108	0.3	0
HVAC109	-0.2	0
HVAC110	1.3	0
HVAC111	1.2	0
HVAC112	0.7	0
HVAC113	0.6	0
HVAC114	0.3	0
HVAC115	0.0	0
HVAC116	5.5	0
HVAC117	5.3	0
HVAC118	5.1	0
HVAC119	5.1	0
HVAC120	4.8	0
HVAC121	4.8	0
HVAC122	4.9	0
HVAC123	7.3	0
HVAC124	7.1	0
HVAC125	6.7	0
HVAC126	6.7	0
HVAC127	6.5	0
HVAC128	6.5	0
HVAC129	6.5	0
HVAC130	4.7	0
HVAC131	4.9	0
HVAC132	4.8	0
HVAC133	4.8	0
HVAC134	4.5	0
HVAC135	4.5	0
HVAC136	4.2	0
HVAC137	-3.5	0
HVAC138	-3.5	0
HVAC139	-3.5	0
HVAC140	-3.5	0
HVAC141	-3.6	0
HVAC142	-3.6	0
HVAC143	-0.7	0
HVAC144	1.4	0
HVAC145	1.0	0
HVAC146	1.3	0
HVAC147	1.8	0
HVAC148	2.6	0
HVAC149	2.8	0
HVAC150	0.3	0
HVAC151	1.1	0
HVAC152	0.8	0
HVAC153	1.4	0
HVAC154	1.4	0
HVAC155	0.9	0
HVAC156	-3.3	0
HVAC157	-0.3	0
HVAC158	-0.2	0
HVAC159	-2.2	0
HVAC160	-0.3	0
HVAC161	-2.2	0

HVAC162		2.7	0
HVAC163		2.8	0
HVAC164		3.7	0
HVAC165		4.0	0
HVAC166		8.8	0
HVAC167		4.7	0
HVAC168		4.6	0
HVAC169		5.0	0
HVAC170		5.3	0
HVAC171		10.2	0
HVAC172		11.1	0
HVAC173		21.7	0
2 1.FI	35.6	0.0	
HVAC1		-1.9	0
HVAC2		-1.7	0
HVAC3		-1.6	0
HVAC4		-1.4	0
HVAC5		-1.4	0
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HVAC7		-1.5	0
HVAC8		-1.7	0
HVAC9		-1.7	0
HVAC10		-2.0	0
HVAC11		12.7	0
HVAC12		19.3	0
HVAC13		12.0	0
HVAC14		12.0	0
HVAC15		17.4	0
HVAC16		10.3	0
HVAC17		10.3	0
HVAC18		9.9	0
HVAC19		9.8	0
HVAC20		9.1	0
HVAC21		9.9	0
HVAC22		5.9	0
HVAC23		9.4	0
HVAC24		9.2	0
HVAC25		8.6	0
HVAC26		4.0	0
HVAC27		3.9	0
HVAC28		-0.2	0
HVAC29		-0.1	0
HVAC30		0.0	0
HVAC31		0.0	0
HVAC32		0.0	0
HVAC33		1.6	0
HVAC34		1.1	0
HVAC35		1.0	0
HVAC36		0.8	0
HVAC37		0.9	0
HVAC38		0.9	0
HVAC39		2.2	0
HVAC40		2.2	0
HVAC41		2.3	0
HVAC42		2.5	0

HVAC43	2.5	0
HVAC44	2.5	0
HVAC45	2.4	0
HVAC46	3.6	0
HVAC47	3.7	0
HVAC48	3.7	0
HVAC49	3.9	0
HVAC50	5.7	0
HVAC51	5.8	0
HVAC52	6.1	0
HVAC53	6.1	0
HVAC54	6.1	0
HVAC55	5.9	0
HVAC56	8.5	0
HVAC57	8.3	0
HVAC58	8.1	0
HVAC59	8.0	0
HVAC60	8.0	0
HVAC61	8.4	0
HVAC62	20.4	0
HVAC63	18.8	0
HVAC64	19.6	0
HVAC65	22.0	0
HVAC66	17.0	0
HVAC67	14.2	0
HVAC68	24.1	0
HVAC69	23.0	0
HVAC70	23.1	0
HVAC71	23.2	0
HVAC72	24.6	0
HVAC73	27.3	0
HVAC74	2.7	0
HVAC75	2.7	0
HVAC76	3.0	0
HVAC77	3.2	0
HVAC78	3.5	0
HVAC79	4.0	0
HVAC80	2.4	0
HVAC81	2.4	0
HVAC82	2.7	0
HVAC83	3.0	0
HVAC84	3.3	0
HVAC85	3.7	0
HVAC86	0.9	0
HVAC87	0.9	0
HVAC88	0.7	0
HVAC89	0.5	0
HVAC90	0.3	0
HVAC91	0.0	0
HVAC92	-1.2	0
HVAC93	-1.2	0
HVAC94	-1.4	0
HVAC95	-1.6	0
HVAC96	-1.7	0
HVAC97	-2.0	0

HVAC98	-1.4	0
HVAC99	-1.4	0
HVAC100	-1.6	0
HVAC101	-1.6	0
HVAC102	-1.6	0
HVAC103	-1.6	0
HVAC104	-0.5	0
HVAC105	-0.5	0
HVAC106	-0.4	0
HVAC107	-0.5	0
HVAC108	-0.5	0
HVAC109	-0.7	0
HVAC110	0.6	0
HVAC111	0.5	0
HVAC112	0.3	0
HVAC113	0.3	0
HVAC114	0.3	0
HVAC115	0.3	0
HVAC116	1.1	0
HVAC117	1.1	0
HVAC118	0.9	0
HVAC119	0.8	0
HVAC120	0.3	0
HVAC121	0.2	0
HVAC122	1.7	0
HVAC123	8.1	0
HVAC124	8.0	0
HVAC125	7.5	0
HVAC126	7.3	0
HVAC127	6.2	0
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HVAC133	6.5	0
HVAC134	5.5	0
HVAC135	5.4	0
HVAC136	4.7	0
HVAC137	-6.5	0
HVAC138	-6.5	0
HVAC139	-2.2	0
HVAC140	-2.2	0
HVAC141	-2.3	0
HVAC142	-2.3	0
HVAC143	-2.4	0
HVAC144	2.5	0
HVAC145	3.5	0
HVAC146	2.3	0
HVAC147	3.0	0
HVAC148	3.0	0
HVAC149	3.5	0
HVAC150	1.3	0
HVAC151	1.8	0
HVAC152	1.7	0

HVAC153	1.7	0
HVAC154	1.8	0
HVAC155	1.7	0
HVAC156	3.1	0
HVAC157	1.3	0
HVAC158	1.1	0
HVAC159	1.2	0
HVAC160	1.5	0
HVAC161	1.3	0
HVAC162	14.9	0
HVAC163	15.1	0
HVAC164	15.6	0
HVAC165	15.9	0
HVAC166	19.4	0
HVAC167	9.2	0
HVAC168	9.0	0
HVAC169	9.4	0
HVAC170	10.2	0
HVAC171	22.8	0
HVAC172	22.6	0
HVAC173	24.3	0
3 1.FI 36.9	0.0	
HVAC1	-1.8	0
HVAC2	-1.4	0
HVAC3	-1.4	0
HVAC4	-1.5	0
HVAC5	-1.4	0
HVAC6	-5.3	0
HVAC7	-5.1	0
HVAC8	-5.2	0
HVAC9	-5.2	0
HVAC10	-5.4	0
HVAC11	22.2	0
HVAC12	22.3	0
HVAC13	20.2	0
HVAC14	19.5	0
HVAC15	18.3	0
HVAC16	21.0	0
HVAC17	21.4	0
HVAC18	21.6	0
HVAC19	21.4	0
HVAC20	16.9	0
HVAC21	11.2	0
HVAC22	11.3	0
HVAC23	11.3	0
HVAC24	11.4	0
HVAC25	16.7	0
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HVAC27	2.9	0
HVAC28	-4.6	0
HVAC29	-4.5	0
HVAC30	-4.1	0
HVAC31	-1.8	0
HVAC32	-1.3	0
HVAC33	0.0	0

HVAC34	-3.9	0
HVAC35	-3.9	0
HVAC36	-2.1	0
HVAC37	-1.7	0
HVAC38	-0.9	0
HVAC39	0.3	0
HVAC40	-3.2	0
HVAC41	-3.1	0
HVAC42	1.8	0
HVAC43	2.1	0
HVAC44	-1.9	0
HVAC45	-1.3	0
HVAC46	2.7	0
HVAC47	2.8	0
HVAC48	3.0	0
HVAC49	-0.1	0
HVAC50	4.5	0
HVAC51	4.5	0
HVAC52	4.9	0
HVAC53	5.0	0
HVAC54	5.1	0
HVAC55	5.4	0
HVAC56	11.2	0
HVAC57	11.2	0
HVAC58	12.1	0
HVAC59	12.3	0
HVAC60	12.7	0
HVAC61	13.4	0
HVAC62	6.8	0
HVAC63	7.0	0
HVAC64	7.8	0
HVAC65	8.0	0
HVAC66	13.0	0
HVAC67	12.2	0
HVAC68	21.0	0
HVAC69	17.9	0
HVAC70	17.9	0
HVAC71	19.2	0
HVAC72	20.4	0
HVAC73	24.8	0
HVAC74	4.8	0
HVAC75	11.8	0
HVAC76	12.4	0
HVAC77	12.9	0
HVAC78	13.2	0
HVAC79	6.1	0
HVAC80	12.0	0
HVAC81	12.0	0
HVAC82	12.5	0
HVAC83	12.9	0
HVAC84	13.3	0
HVAC85	8.7	0
HVAC86	10.2	0
HVAC87	10.4	0
HVAC88	11.1	0

HVAC89	10.9	0
HVAC90	7.9	0
HVAC91	10.1	0
HVAC92	7.0	0
HVAC93	9.3	0
HVAC94	8.4	0
HVAC95	8.2	0
HVAC96	8.0	0
HVAC97	5.1	0
HVAC98	-2.5	0
HVAC99	-2.5	0
HVAC100	-2.8	0
HVAC101	-2.8	0
HVAC102	-2.9	0
HVAC103	-3.5	0
HVAC104	-1.8	0
HVAC105	-1.6	0
HVAC106	-1.7	0
HVAC107	2.6	0
HVAC108	2.5	0
HVAC109	2.4	0
HVAC110	-0.7	0
HVAC111	-0.7	0
HVAC112	3.5	0
HVAC113	3.5	0
HVAC114	3.3	0
HVAC115	3.4	0
HVAC116	10.7	0
HVAC117	10.9	0
HVAC118	11.5	0
HVAC119	11.5	0
HVAC120	11.0	0
HVAC121	10.9	0
HVAC122	7.8	0
HVAC123	16.0	0
HVAC124	16.3	0
HVAC125	13.1	0
HVAC126	13.0	0
HVAC127	11.5	0
HVAC128	11.5	0
HVAC129	6.4	0
HVAC130	12.2	0
HVAC131	12.8	0
HVAC132	13.5	0
HVAC133	14.2	0
HVAC134	10.8	0
HVAC135	10.7	0
HVAC136	7.6	0
HVAC137	-2.4	0
HVAC138	-2.3	0
HVAC139	-3.3	0
HVAC140	-3.9	0
HVAC141	-4.1	0
HVAC142	-4.1	0
HVAC143	-4.2	0

HVAC144		6.7	0
HVAC145		6.4	0
HVAC146		6.8	0
HVAC147		6.5	0
HVAC148		6.6	0
HVAC149		6.6	0
HVAC150		4.7	0
HVAC151		5.1	0
HVAC152		5.0	0
HVAC153		4.9	0
HVAC154		5.0	0
HVAC155		5.0	0
HVAC156		9.9	0
HVAC157		10.4	0
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HVAC159		9.9	0
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HVAC161		10.1	0
HVAC162		22.5	0
HVAC163		19.1	0
HVAC164		23.7	0
HVAC165		23.7	0
HVAC166		24.8	0
HVAC167		18.0	0
HVAC168		18.7	0
HVAC169		19.5	0
HVAC170		18.0	0
HVAC171		23.1	0
HVAC172		20.3	0
HVAC173		24.1	0
4	1.Fl	34.8	0.0
HVAC1		-1.3	0
HVAC2		-5.6	0
HVAC3		-5.6	0
HVAC4		-5.4	0
HVAC5		-5.4	0
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HVAC7		-5.8	0
HVAC8		-5.9	0
HVAC9		-6.0	0
HVAC10		-6.2	0
HVAC11		23.2	0
HVAC12		23.1	0
HVAC13		23.0	0
HVAC14		22.0	0
HVAC15		23.7	0
HVAC16		14.9	0
HVAC17		16.2	0
HVAC18		17.2	0
HVAC19		17.6	0
HVAC20		19.6	0
HVAC21		11.9	0
HVAC22		11.9	0
HVAC23		12.7	0
HVAC24		14.3	0

HVAC25	16.3	0
HVAC26	-1.0	0
HVAC27	-1.0	0
HVAC28	-4.8	0
HVAC29	-4.6	0
HVAC30	-2.8	0
HVAC31	-2.8	0
HVAC32	-2.7	0
HVAC33	-4.4	0
HVAC34	-3.7	0
HVAC35	-3.8	0
HVAC36	-3.9	0
HVAC37	-3.8	0
HVAC38	-3.4	0
HVAC39	-3.3	0
HVAC40	-2.0	0
HVAC41	-2.0	0
HVAC42	-1.7	0
HVAC43	-1.6	0
HVAC44	-1.6	0
HVAC45	-2.5	0
HVAC46	-0.6	0
HVAC47	-0.6	0
HVAC48	-0.6	0
HVAC49	0.8	0
HVAC50	-0.1	0
HVAC51	0.0	0
HVAC52	5.1	0
HVAC53	5.1	0
HVAC54	5.3	0
HVAC55	5.4	0
HVAC56	6.3	0
HVAC57	6.2	0
HVAC58	6.0	0
HVAC59	6.2	0
HVAC60	6.5	0
HVAC61	7.1	0
HVAC62	12.2	0
HVAC63	10.6	0
HVAC64	14.4	0
HVAC65	14.9	0
HVAC66	13.4	0
HVAC67	13.4	0
HVAC68	11.2	0
HVAC69	11.0	0
HVAC70	11.2	0
HVAC71	14.9	0
HVAC72	15.5	0
HVAC73	16.6	0
HVAC74	3.1	0
HVAC75	3.1	0
HVAC76	3.5	0
HVAC77	3.7	0
HVAC78	4.0	0
HVAC79	4.4	0

HVAC80	3.4	0
HVAC81	3.4	0
HVAC82	3.7	0
HVAC83	3.9	0
HVAC84	5.9	0
HVAC85	4.8	0
HVAC86	2.8	0
HVAC87	2.7	0
HVAC88	2.3	0
HVAC89	2.3	0
HVAC90	2.2	0
HVAC91	2.3	0
HVAC92	0.2	0
HVAC93	0.1	0
HVAC94	-0.1	0
HVAC95	-0.1	0
HVAC96	-0.2	0
HVAC97	-0.1	0
HVAC98	2.3	0
HVAC99	2.3	0
HVAC100	2.9	0
HVAC101	3.6	0
HVAC102	4.9	0
HVAC103	8.0	0
HVAC104	2.2	0
HVAC105	2.2	0
HVAC106	8.4	0
HVAC107	9.3	0
HVAC108	7.5	0
HVAC109	12.6	0
HVAC110	6.7	0
HVAC111	6.7	0
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HVAC114	10.3	0
HVAC115	9.8	0
HVAC116	1.7	0
HVAC117	1.7	0
HVAC118	-3.2	0
HVAC119	-3.3	0
HVAC120	-3.7	0
HVAC121	0.9	0
HVAC122	-2.1	0
HVAC123	7.9	0
HVAC124	8.0	0
HVAC125	8.1	0
HVAC126	8.1	0
HVAC127	7.0	0
HVAC128	6.9	0
HVAC129	2.1	0
HVAC130	9.0	0
HVAC131	9.0	0
HVAC132	8.4	0
HVAC133	7.7	0
HVAC134	6.6	0

HVAC135			6.5	0
HVAC136			5.9	0
HVAC137			1.4	0
HVAC138			1.4	0
HVAC139			1.5	0
HVAC140			1.9	0
HVAC141			4.4	0
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HVAC143			11.2	0
HVAC144			11.1	0
HVAC145			13.9	0
HVAC146			11.4	0
HVAC147			9.7	0
HVAC148			9.8	0
HVAC149			16.2	0
HVAC150			14.6	0
HVAC151			9.6	0
HVAC152			12.5	0
HVAC153			7.9	0
HVAC154			8.7	0
HVAC155			7.1	0
HVAC156			18.0	0
HVAC157			13.2	0
HVAC158			10.8	0
HVAC159			10.2	0
HVAC160			14.7	0
HVAC161			10.2	0
HVAC162			13.4	0
HVAC163			13.1	0
HVAC164			13.7	0
HVAC165			14.3	0
HVAC166			21.6	0
HVAC167			11.4	0
HVAC168			11.5	0
HVAC169			16.0	0
HVAC170			16.0	0
HVAC171			20.3	0
HVAC172			20.9	0
HVAC173			20.1	0
5	1.FI	36.6	0.0	
HVAC1			3.9	0
HVAC2			4.1	0
HVAC3			4.2	0
HVAC4			4.1	0
HVAC5			4.1	0
HVAC6			3.3	0
HVAC7			3.2	0
HVAC8			3.1	0
HVAC9			2.7	0
HVAC10			0.7	0
HVAC11			18.7	0
HVAC12			18.8	0
HVAC13			20.8	0
HVAC14			21.3	0
HVAC15			24.0	0

HVAC16	20.3	0
HVAC17	20.4	0
HVAC18	19.8	0
HVAC19	20.4	0
HVAC20	22.9	0
HVAC21	20.6	0
HVAC22	20.4	0
HVAC23	21.8	0
HVAC24	21.9	0
HVAC25	21.7	0
HVAC26	3.0	0
HVAC27	3.0	0
HVAC28	4.8	0
HVAC29	4.8	0
HVAC30	4.9	0
HVAC31	4.9	0
HVAC32	2.7	0
HVAC33	2.5	0
HVAC34	2.3	0
HVAC35	2.2	0
HVAC36	2.5	0
HVAC37	2.7	0
HVAC38	2.9	0
HVAC39	3.3	0
HVAC40	3.6	0
HVAC41	3.7	0
HVAC42	3.9	0
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HVAC44	4.0	0
HVAC45	3.4	0
HVAC46	3.3	0
HVAC47	3.5	0
HVAC48	5.7	0
HVAC49	5.9	0
HVAC50	3.0	0
HVAC51	3.0	0
HVAC52	3.3	0
HVAC53	3.5	0
HVAC54	3.7	0
HVAC55	6.4	0
HVAC56	9.0	0
HVAC57	8.7	0
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HVAC63	7.9	0
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HVAC65	8.4	0
HVAC66	8.6	0
HVAC67	9.1	0
HVAC68	8.1	0
HVAC69	8.1	0
HVAC70	8.3	0

HVAC71	8.5	0
HVAC72	8.8	0
HVAC73	9.4	0
HVAC74	9.3	0
HVAC75	9.4	0
HVAC76	9.6	0
HVAC77	9.7	0
HVAC78	11.1	0
HVAC79	11.8	0
HVAC80	11.4	0
HVAC81	11.2	0
HVAC82	11.1	0
HVAC83	11.2	0
HVAC84	11.3	0
HVAC85	11.7	0
HVAC86	7.3	0
HVAC87	7.1	0
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HVAC90	6.7	0
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HVAC95	5.6	0
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HVAC103	14.1	0
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HVAC105	12.8	0
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HVAC107	13.9	0
HVAC108	14.1	0
HVAC109	16.3	0
HVAC110	13.2	0
HVAC111	13.2	0
HVAC112	13.7	0
HVAC113	14.3	0
HVAC114	15.3	0
HVAC115	17.6	0
HVAC116	9.0	0
HVAC117	9.3	0
HVAC118	6.6	0
HVAC119	6.5	0
HVAC120	5.8	0
HVAC121	5.7	0
HVAC122	5.3	0
HVAC123	10.4	0
HVAC124	10.4	0
HVAC125	10.4	0

HVAC126		10.4	0
HVAC127		5.9	0
HVAC128		5.9	0
HVAC129		5.8	0
HVAC130		15.3	0
HVAC131		14.8	0
HVAC132		12.3	0
HVAC133		12.3	0
HVAC134		14.7	0
HVAC135		14.7	0
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HVAC138		10.8	0
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HVAC140		11.2	0
HVAC141		11.8	0
HVAC142		12.2	0
HVAC143		12.1	0
HVAC144		16.0	0
HVAC145		17.8	0
HVAC146		16.9	0
HVAC147		16.6	0
HVAC148		16.6	0
HVAC149		18.5	0
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HVAC151		16.8	0
HVAC152		17.5	0
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HVAC154		16.5	0
HVAC155		17.0	0
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HVAC157		17.8	0
HVAC158		19.4	0
HVAC159		17.8	0
HVAC160		20.4	0
HVAC161		17.8	0
HVAC162		14.8	0
HVAC163		14.7	0
HVAC164		14.4	0
HVAC165		14.4	0
HVAC166		15.1	0
HVAC167		10.5	0
HVAC168		10.6	0
HVAC169		10.7	0
HVAC170		10.7	0
HVAC171		12.1	0
HVAC172		12.8	0
HVAC173		13.7	0
6 1.FI	38.1	0.0	
HVAC1		3.7	0
HVAC2		8.0	0
HVAC3		8.0	0
HVAC4		8.3	0
HVAC5		8.3	0
HVAC6		1.8	0

HVAC7	1.8	0
HVAC8	0.6	0
HVAC9	0.6	0
HVAC10	1.5	0
HVAC11	17.1	0
HVAC12	17.2	0
HVAC13	20.6	0
HVAC14	20.6	0
HVAC15	20.7	0
HVAC16	21.0	0
HVAC17	20.6	0
HVAC18	19.9	0
HVAC19	20.2	0
HVAC20	22.3	0
HVAC21	19.4	0
HVAC22	19.6	0
HVAC23	21.5	0
HVAC24	21.9	0
HVAC25	23.8	0
HVAC26	3.3	0
HVAC27	2.8	0
HVAC28	1.7	0
HVAC29	1.7	0
HVAC30	1.9	0
HVAC31	2.1	0
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HVAC33	2.9	0
HVAC34	3.8	0
HVAC35	3.1	0
HVAC36	2.8	0
HVAC37	5.3	0
HVAC38	5.4	0
HVAC39	7.8	0
HVAC40	5.7	0
HVAC41	5.7	0
HVAC42	6.2	0
HVAC43	6.2	0
HVAC44	6.5	0
HVAC45	6.2	0
HVAC46	3.3	0
HVAC47	3.6	0
HVAC48	3.9	0
HVAC49	4.3	0
HVAC50	3.3	0
HVAC51	3.2	0
HVAC52	3.4	0
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HVAC54	8.3	0
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HVAC60	12.7	0
HVAC61	13.2	0

HVAC62	8.0	0
HVAC63	7.9	0
HVAC64	8.8	0
HVAC65	9.0	0
HVAC66	10.3	0
HVAC67	10.7	0
HVAC68	9.6	0
HVAC69	9.6	0
HVAC70	9.9	0
HVAC71	10.1	0
HVAC72	11.1	0
HVAC73	9.0	0
HVAC74	12.0	0
HVAC75	12.1	0
HVAC76	12.5	0
HVAC77	13.2	0
HVAC78	13.7	0
HVAC79	10.7	0
HVAC80	12.3	0
HVAC81	12.3	0
HVAC82	13.7	0
HVAC83	15.9	0
HVAC84	16.1	0
HVAC85	17.0	0
HVAC86	11.3	0
HVAC87	11.2	0
HVAC88	10.8	0
HVAC89	10.9	0
HVAC90	10.8	0
HVAC91	11.4	0
HVAC92	9.0	0
HVAC93	8.9	0
HVAC94	8.7	0
HVAC95	4.9	0
HVAC96	4.7	0
HVAC97	5.1	0
HVAC98	13.5	0
HVAC99	13.5	0
HVAC100	14.3	0
HVAC101	14.4	0
HVAC102	15.5	0
HVAC103	18.6	0
HVAC104	15.0	0
HVAC105	15.1	0
HVAC106	15.8	0
HVAC107	16.2	0
HVAC108	18.9	0
HVAC109	18.1	0
HVAC110	15.4	0
HVAC111	15.3	0
HVAC112	16.4	0
HVAC113	18.8	0
HVAC114	18.7	0
HVAC115	21.4	0
HVAC116	9.2	0

HVAC117	9.3	0
HVAC118	9.3	0
HVAC119	9.3	0
HVAC120	9.1	0
HVAC121	9.1	0
HVAC122	9.1	0
HVAC123	15.8	0
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HVAC126	16.3	0
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HVAC130	18.7	0
HVAC131	18.6	0
HVAC132	18.3	0
HVAC133	18.3	0
HVAC134	14.0	0
HVAC135	14.0	0
HVAC136	14.3	0
HVAC137	12.3	0
HVAC138	12.4	0
HVAC139	12.6	0
HVAC140	12.8	0
HVAC141	14.8	0
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HVAC143	15.4	0
HVAC144	18.5	0
HVAC145	20.4	0
HVAC146	22.1	0
HVAC147	20.3	0
HVAC148	21.0	0
HVAC149	23.3	0
HVAC150	21.6	0
HVAC151	17.9	0
HVAC152	21.4	0
HVAC153	18.0	0
HVAC154	19.3	0
HVAC155	18.8	0
HVAC156	24.3	0
HVAC157	19.9	0
HVAC158	19.0	0
HVAC159	17.8	0
HVAC160	21.1	0
HVAC161	17.8	0
HVAC162	12.6	0
HVAC163	12.4	0
HVAC164	15.3	0
HVAC165	14.9	0
HVAC166	14.4	0
HVAC167	10.3	0
HVAC168	10.4	0
HVAC169	12.1	0
HVAC170	12.0	0
HVAC171	12.8	0

HVAC172		12.6	0
HVAC173		12.2	0
7 1.Fl	38.1	0.0	
HVAC1		9.7	0
HVAC2		8.5	0
HVAC3		8.5	0
HVAC4		8.3	0
HVAC5		8.3	0
HVAC6		1.6	0
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HVAC9		1.5	0
HVAC10		1.4	0
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HVAC14		15.9	0
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HVAC17		16.9	0
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HVAC19		17.6	0
HVAC20		18.8	0
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HVAC22		16.9	0
HVAC23		19.9	0
HVAC24		20.2	0
HVAC25		19.8	0
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HVAC27		3.2	0
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HVAC29		7.5	0
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HVAC32		8.1	0
HVAC33		8.4	0
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HVAC35		11.8	0
HVAC36		10.3	0
HVAC37		10.4	0
HVAC38		10.6	0
HVAC39		12.9	0
HVAC40		3.8	0
HVAC41		3.6	0
HVAC42		3.5	0
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HVAC45		6.0	0
HVAC46		3.4	0
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HVAC48		8.2	0
HVAC49		8.6	0
HVAC50		7.5	0
HVAC51		6.7	0
HVAC52		6.1	0

HVAC53	6.1	0
HVAC54	10.1	0
HVAC55	10.6	0
HVAC56	9.2	0
HVAC57	9.2	0
HVAC58	9.4	0
HVAC59	10.8	0
HVAC60	8.3	0
HVAC61	8.6	0
HVAC62	7.4	0
HVAC63	7.4	0
HVAC64	7.7	0
HVAC65	8.0	0
HVAC66	8.2	0
HVAC67	8.6	0
HVAC68	6.2	0
HVAC69	6.3	0
HVAC70	6.5	0
HVAC71	6.6	0
HVAC72	6.5	0
HVAC73	9.6	0
HVAC74	10.4	0
HVAC75	10.5	0
HVAC76	10.7	0
HVAC77	10.6	0
HVAC78	13.3	0
HVAC79	13.1	0
HVAC80	12.8	0
HVAC81	12.6	0
HVAC82	16.4	0
HVAC83	16.7	0
HVAC84	12.2	0
HVAC85	16.9	0
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HVAC87	15.2	0
HVAC88	14.4	0
HVAC89	12.2	0
HVAC90	12.0	0
HVAC91	12.0	0
HVAC92	10.1	0
HVAC93	10.0	0
HVAC94	11.3	0
HVAC95	11.0	0
HVAC96	10.5	0
HVAC97	10.0	0
HVAC98	15.3	0
HVAC99	15.3	0
HVAC100	16.5	0
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HVAC102	19.4	0
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HVAC104	21.4	0
HVAC105	21.6	0
HVAC106	21.0	0
HVAC107	21.0	0

HVAC108	21.5	0
HVAC109	22.0	0
HVAC110	19.5	0
HVAC111	17.6	0
HVAC112	18.6	0
HVAC113	19.4	0
HVAC114	20.8	0
HVAC115	24.5	0
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HVAC117	13.3	0
HVAC118	12.7	0
HVAC119	12.7	0
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HVAC121	10.3	0
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HVAC123	9.8	0
HVAC124	9.9	0
HVAC125	10.1	0
HVAC126	10.1	0
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HVAC128	10.3	0
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HVAC131	12.1	0
HVAC132	11.8	0
HVAC133	11.8	0
HVAC134	11.9	0
HVAC135	11.9	0
HVAC136	12.3	0
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HVAC146	20.3	0
HVAC147	18.2	0
HVAC148	17.7	0
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HVAC150	24.3	0
HVAC151	18.7	0
HVAC152	21.4	0
HVAC153	17.7	0
HVAC154	17.5	0
HVAC155	19.9	0
HVAC156	21.7	0
HVAC157	19.7	0
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HVAC159	16.0	0
HVAC160	19.9	0
HVAC161	19.9	0
HVAC162	12.1	0

HVAC163		12.0	0
HVAC164		11.8	0
HVAC165		11.7	0
HVAC166		11.6	0
HVAC167		7.5	0
HVAC168		7.5	0
HVAC169		11.0	0
HVAC170		10.7	0
HVAC171		10.3	0
HVAC172		10.2	0
HVAC173		10.0	0
8 1.Fl	37.4	0.0	
HVAC1		9.0	0
HVAC2		9.2	0
HVAC3		9.4	0
HVAC4		11.2	0
HVAC5		11.2	0
HVAC6		4.4	0
HVAC7		4.7	0
HVAC8		4.5	0
HVAC9		4.1	0
HVAC10		2.3	0
HVAC11		13.1	0
HVAC12		13.0	0
HVAC13		13.7	0
HVAC14		13.8	0
HVAC15		15.4	0
HVAC16		14.3	0
HVAC17		14.3	0
HVAC18		14.9	0
HVAC19		14.9	0
HVAC20		15.3	0
HVAC21		15.1	0
HVAC22		15.2	0
HVAC23		15.7	0
HVAC24		17.7	0
HVAC25		16.9	0
HVAC26		7.4	0
HVAC27		7.4	0
HVAC28		7.4	0
HVAC29		7.3	0
HVAC30		7.4	0
HVAC31		7.6	0
HVAC32		7.8	0
HVAC33		8.6	0
HVAC34		7.0	0
HVAC35		7.0	0
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HVAC37		7.5	0
HVAC38		7.7	0
HVAC39		8.0	0
HVAC40		6.3	0
HVAC41		6.0	0
HVAC42		5.4	0
HVAC43		5.4	0

HVAC44	5.4	0
HVAC45	6.2	0
HVAC46	7.7	0
HVAC47	7.8	0
HVAC48	8.0	0
HVAC49	8.2	0
HVAC50	7.2	0
HVAC51	7.2	0
HVAC52	7.4	0
HVAC53	7.6	0
HVAC54	7.8	0
HVAC55	8.2	0
HVAC56	6.0	0
HVAC57	6.0	0
HVAC58	6.2	0
HVAC59	6.2	0
HVAC60	6.2	0
HVAC61	5.9	0
HVAC62	7.6	0
HVAC63	7.5	0
HVAC64	7.7	0
HVAC65	7.8	0
HVAC66	7.9	0
HVAC67	8.3	0
HVAC68	7.3	0
HVAC69	7.3	0
HVAC70	7.5	0
HVAC71	7.7	0
HVAC72	7.8	0
HVAC73	8.1	0
HVAC74	9.9	0
HVAC75	10.0	0
HVAC76	10.1	0
HVAC77	10.0	0
HVAC78	10.0	0
HVAC79	9.8	0
HVAC80	12.0	0
HVAC81	11.9	0
HVAC82	11.6	0
HVAC83	11.5	0
HVAC84	11.5	0
HVAC85	14.4	0
HVAC86	11.9	0
HVAC87	11.8	0
HVAC88	11.5	0
HVAC89	15.6	0
HVAC90	17.1	0
HVAC91	12.1	0
HVAC92	13.2	0
HVAC93	13.0	0
HVAC94	11.0	0
HVAC95	10.4	0
HVAC96	10.4	0
HVAC97	10.4	0
HVAC98	18.4	0

HVAC99	17.7	0
HVAC100	18.6	0
HVAC101	19.6	0
HVAC102	20.8	0
HVAC103	23.6	0
HVAC104	17.4	0
HVAC105	17.1	0
HVAC106	18.3	0
HVAC107	19.6	0
HVAC108	20.8	0
HVAC109	24.0	0
HVAC110	17.3	0
HVAC111	17.8	0
HVAC112	19.7	0
HVAC113	19.9	0
HVAC114	20.6	0
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HVAC119	9.9	0
HVAC120	10.1	0
HVAC121	10.2	0
HVAC122	14.2	0
HVAC123	9.8	0
HVAC124	9.8	0
HVAC125	10.0	0
HVAC126	10.1	0
HVAC127	11.1	0
HVAC128	11.4	0
HVAC129	8.1	0
HVAC130	11.3	0
HVAC131	11.2	0
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HVAC133	11.2	0
HVAC134	11.5	0
HVAC135	11.5	0
HVAC136	12.1	0
HVAC137	18.8	0
HVAC138	16.2	0
HVAC139	20.0	0
HVAC140	20.2	0
HVAC141	21.1	0
HVAC142	21.1	0
HVAC143	22.1	0
HVAC144	16.7	0
HVAC145	18.3	0
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HVAC150	21.4	0
HVAC151	19.6	0
HVAC152	21.8	0
HVAC153	19.9	0

HVAC154			19.6	0
HVAC155			21.6	0
HVAC156			19.0	0
HVAC157			15.4	0
HVAC158			14.9	0
HVAC159			14.7	0
HVAC160			17.4	0
HVAC161			14.6	0
HVAC162			8.0	0
HVAC163			7.9	0
HVAC164			7.7	0
HVAC165			7.8	0
HVAC166			9.3	0
HVAC167			4.3	0
HVAC168			4.5	0
HVAC169			5.6	0
HVAC170			5.6	0
HVAC171			6.3	0
HVAC172			6.2	0
HVAC173			6.3	0
9	1.Fl	36.2	0.0	
HVAC1			8.7	0
HVAC2			8.6	0
HVAC3			8.6	0
HVAC4			8.5	0
HVAC5			8.4	0
HVAC6			1.7	0
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HVAC8			1.8	0
HVAC9			1.9	0
HVAC10			2.2	0
HVAC11			11.7	0
HVAC12			11.6	0
HVAC13			12.6	0
HVAC14			12.8	0
HVAC15			13.5	0
HVAC16			12.5	0
HVAC17			12.4	0
HVAC18			13.5	0
HVAC19			13.7	0
HVAC20			13.1	0
HVAC21			12.2	0
HVAC22			12.1	0
HVAC23			14.0	0
HVAC24			14.0	0
HVAC25			15.3	0
HVAC26			7.8	0
HVAC27			7.9	0
HVAC28			8.2	0
HVAC29			7.8	0
HVAC30			7.6	0
HVAC31			7.7	0
HVAC32			8.0	0
HVAC33			9.1	0
HVAC34			2.6	0

HVAC35	2.7	0
HVAC36	2.9	0
HVAC37	3.1	0
HVAC38	3.4	0
HVAC39	3.7	0
HVAC40	2.8	0
HVAC41	2.8	0
HVAC42	5.1	0
HVAC43	5.3	0
HVAC44	5.5	0
HVAC45	5.8	0
HVAC46	8.1	0
HVAC47	7.9	0
HVAC48	7.9	0
HVAC49	7.8	0
HVAC50	6.8	0
HVAC51	6.7	0
HVAC52	6.8	0
HVAC53	7.0	0
HVAC54	7.2	0
HVAC55	7.5	0
HVAC56	6.4	0
HVAC57	6.4	0
HVAC58	6.6	0
HVAC59	6.8	0
HVAC60	7.0	0
HVAC61	8.2	0
HVAC62	6.8	0
HVAC63	6.8	0
HVAC64	6.9	0
HVAC65	7.1	0
HVAC66	7.2	0
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HVAC69	6.7	0
HVAC70	6.9	0
HVAC71	7.1	0
HVAC72	7.3	0
HVAC73	8.6	0
HVAC74	9.3	0
HVAC75	9.4	0
HVAC76	9.5	0
HVAC77	9.3	0
HVAC78	9.2	0
HVAC79	9.0	0
HVAC80	10.9	0
HVAC81	10.8	0
HVAC82	10.6	0
HVAC83	10.4	0
HVAC84	10.4	0
HVAC85	11.4	0
HVAC86	13.2	0
HVAC87	13.1	0
HVAC88	13.6	0
HVAC89	11.6	0

HVAC90	11.7	0
HVAC91	12.1	0
HVAC92	10.2	0
HVAC93	10.1	0
HVAC94	9.9	0
HVAC95	9.8	0
HVAC96	9.8	0
HVAC97	13.1	0
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HVAC99	18.5	0
HVAC100	18.4	0
HVAC101	19.2	0
HVAC102	20.6	0
HVAC103	23.2	0
HVAC104	20.0	0
HVAC105	19.6	0
HVAC106	21.2	0
HVAC107	21.4	0
HVAC108	19.4	0
HVAC109	21.5	0
HVAC110	18.4	0
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HVAC116	5.9	0
HVAC117	6.0	0
HVAC118	9.9	0
HVAC119	9.9	0
HVAC120	10.1	0
HVAC121	10.0	0
HVAC122	10.0	0
HVAC123	8.7	0
HVAC124	8.8	0
HVAC125	8.9	0
HVAC126	8.9	0
HVAC127	9.2	0
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HVAC132	11.6	0
HVAC133	11.7	0
HVAC134	10.3	0
HVAC135	10.2	0
HVAC136	10.5	0
HVAC137	16.2	0
HVAC138	16.2	0
HVAC139	17.0	0
HVAC140	17.2	0
HVAC141	20.3	0
HVAC142	20.9	0
HVAC143	23.6	0
HVAC144	15.3	0

HVAC145		16.1	0
HVAC146		15.7	0
HVAC147		14.9	0
HVAC148		14.7	0
HVAC149		17.0	0
HVAC150		18.4	0
HVAC151		15.3	0
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HVAC163		8.1	0
HVAC164		8.1	0
HVAC165		8.3	0
HVAC166		8.2	0
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HVAC170		6.5	0
HVAC171		4.6	0
HVAC172		4.5	0
HVAC173		6.2	0
10 1.Fl	34.6	0.0	
HVAC1		14.4	0
HVAC2		14.1	0
HVAC3		14.1	0
HVAC4		13.9	0
HVAC5		13.8	0
HVAC6		8.9	0
HVAC7		8.9	0
HVAC8		9.4	0
HVAC9		9.8	0
HVAC10		13.0	0
HVAC11		10.1	0
HVAC12		10.0	0
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HVAC22		10.4	0
HVAC23		10.9	0
HVAC24		11.5	0
HVAC25		12.8	0

HVAC26	1.8	0
HVAC27	1.8	0
HVAC28	4.8	0
HVAC29	4.8	0
HVAC30	4.6	0
HVAC31	4.6	0
HVAC32	4.8	0
HVAC33	5.1	0
HVAC34	2.9	0
HVAC35	3.0	0
HVAC36	8.0	0
HVAC37	7.9	0
HVAC38	7.9	0
HVAC39	7.8	0
HVAC40	1.7	0
HVAC41	1.7	0
HVAC42	2.0	0
HVAC43	2.2	0
HVAC44	2.4	0
HVAC45	2.7	0
HVAC46	2.0	0
HVAC47	2.0	0
HVAC48	2.2	0
HVAC49	3.1	0
HVAC50	2.3	0
HVAC51	2.3	0
HVAC52	3.4	0
HVAC53	3.4	0
HVAC54	3.4	0
HVAC55	3.8	0
HVAC56	2.1	0
HVAC57	2.2	0
HVAC58	3.0	0
HVAC59	3.2	0
HVAC60	3.4	0
HVAC61	4.0	0
HVAC62	3.7	0
HVAC63	7.0	0
HVAC64	7.0	0
HVAC65	6.9	0
HVAC66	6.9	0
HVAC67	7.0	0
HVAC68	6.3	0
HVAC69	6.3	0
HVAC70	6.4	0
HVAC71	6.5	0
HVAC72	6.6	0
HVAC73	6.7	0
HVAC74	5.7	0
HVAC75	5.7	0
HVAC76	5.4	0
HVAC77	5.3	0
HVAC78	5.3	0
HVAC79	5.0	0
HVAC80	7.0	0

HVAC81	6.8	0
HVAC82	6.8	0
HVAC83	6.9	0
HVAC84	7.2	0
HVAC85	10.4	0
HVAC86	10.5	0
HVAC87	10.4	0
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HVAC103	20.3	0
HVAC104	15.9	0
HVAC105	15.8	0
HVAC106	16.5	0
HVAC107	17.1	0
HVAC108	18.0	0
HVAC109	18.3	0
HVAC110	14.3	0
HVAC111	14.5	0
HVAC112	14.9	0
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HVAC115	16.8	0
HVAC116	8.7	0
HVAC117	8.8	0
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HVAC119	9.0	0
HVAC120	9.4	0
HVAC121	9.5	0
HVAC122	10.0	0
HVAC123	5.3	0
HVAC124	5.4	0
HVAC125	5.5	0
HVAC126	5.6	0
HVAC127	6.4	0
HVAC128	6.4	0
HVAC129	4.9	0
HVAC130	9.1	0
HVAC131	8.2	0
HVAC132	7.1	0
HVAC133	7.1	0
HVAC134	6.5	0
HVAC135	6.6	0

HVAC136		6.8	0
HVAC137		18.6	0
HVAC138		18.5	0
HVAC139		18.2	0
HVAC140		18.3	0
HVAC141		19.2	0
HVAC142		19.3	0
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HVAC152		14.6	0
HVAC153		12.8	0
HVAC154		12.7	0
HVAC155		13.8	0
HVAC156		13.0	0
HVAC157		11.5	0
HVAC158		11.5	0
HVAC159		11.1	0
HVAC160		12.7	0
HVAC161		11.2	0
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HVAC170		4.9	0
HVAC171		5.7	0
HVAC172		5.7	0
HVAC173		5.5	0
11 1.Fl	32.8	0.0	
HVAC1		13.8	0
HVAC2		12.6	0
HVAC3		12.5	0
HVAC4		12.3	0
HVAC5		12.3	0
HVAC6		10.6	0
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HVAC13		8.0	0
HVAC14		8.1	0
HVAC15		8.5	0
HVAC16		8.2	0

HVAC17	8.2	0
HVAC18	8.6	0
HVAC19	8.7	0
HVAC20	9.2	0
HVAC21	8.8	0
HVAC22	8.8	0
HVAC23	9.2	0
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HVAC31	9.3	0
HVAC32	9.5	0
HVAC33	9.6	0
HVAC34	8.8	0
HVAC35	8.7	0
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HVAC37	9.7	0
HVAC38	9.6	0
HVAC39	10.9	0
HVAC40	9.6	0
HVAC41	9.6	0
HVAC42	6.4	0
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HVAC68	3.8	0
HVAC69	3.9	0
HVAC70	3.9	0
HVAC71	3.9	0

HVAC72	3.9	0
HVAC73	3.8	0
HVAC74	9.3	0
HVAC75	9.3	0
HVAC76	9.2	0
HVAC77	9.1	0
HVAC78	8.9	0
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HVAC87	10.8	0
HVAC88	10.9	0
HVAC89	11.1	0
HVAC90	11.3	0
HVAC91	11.9	0
HVAC92	13.0	0
HVAC93	12.9	0
HVAC94	13.2	0
HVAC95	13.2	0
HVAC96	13.3	0
HVAC97	13.6	0
HVAC98	13.8	0
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HVAC102	16.5	0
HVAC103	14.9	0
HVAC104	14.4	0
HVAC105	14.3	0
HVAC106	12.7	0
HVAC107	13.0	0
HVAC108	13.4	0
HVAC109	13.8	0
HVAC110	11.4	0
HVAC111	11.5	0
HVAC112	12.2	0
HVAC113	13.8	0
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HVAC122	12.1	0
HVAC123	4.5	0
HVAC124	4.5	0
HVAC125	4.7	0
HVAC126	4.7	0

HVAC127		5.0	0
HVAC128		5.1	0
HVAC129		4.4	0
HVAC130		6.4	0
HVAC131		6.3	0
HVAC132		5.5	0
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HVAC169		4.0	0
HVAC170		4.0	0
HVAC171		4.6	0
HVAC172		4.7	0
HVAC173		4.6	0
12	1.Fl	32.6	0.0
HVAC1		13.7	0
HVAC2		13.6	0
HVAC3		13.6	0
HVAC4		13.4	0
HVAC5		13.3	0
HVAC6		12.6	0
HVAC7		12.6	0

HVAC8	12.9	0
HVAC9	12.8	0
HVAC10	13.1	0
HVAC11	4.5	0
HVAC12	4.5	0
HVAC13	4.5	0
HVAC14	4.5	0
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HVAC17	4.8	0
HVAC18	4.8	0
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HVAC30	8.7	0
HVAC31	8.6	0
HVAC32	8.7	0
HVAC33	9.7	0
HVAC34	7.9	0
HVAC35	8.0	0
HVAC36	8.5	0
HVAC37	8.4	0
HVAC38	8.3	0
HVAC39	9.0	0
HVAC40	7.3	0
HVAC41	7.3	0
HVAC42	7.8	0
HVAC43	8.3	0
HVAC44	8.3	0
HVAC45	8.8	0
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HVAC59	8.1	0
HVAC60	8.2	0
HVAC61	8.2	0
HVAC62	7.2	0

HVAC63	7.2	0
HVAC64	7.1	0
HVAC65	7.2	0
HVAC66	7.2	0
HVAC67	7.4	0
HVAC68	6.6	0
HVAC69	6.6	0
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HVAC73	6.8	0
HVAC74	10.3	0
HVAC75	10.4	0
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HVAC81	10.1	0
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HVAC83	9.7	0
HVAC84	9.6	0
HVAC85	9.3	0
HVAC86	12.1	0
HVAC87	11.9	0
HVAC88	11.9	0
HVAC89	12.0	0
HVAC90	12.3	0
HVAC91	12.8	0
HVAC92	14.6	0
HVAC93	13.6	0
HVAC94	13.7	0
HVAC95	13.8	0
HVAC96	14.0	0
HVAC97	14.4	0
HVAC98	13.7	0
HVAC99	13.8	0
HVAC100	14.0	0
HVAC101	14.1	0
HVAC102	14.1	0
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HVAC112	11.5	0
HVAC113	11.5	0
HVAC114	11.5	0
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HVAC117	11.5	0

HVAC118	11.9	0
HVAC119	11.8	0
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HVAC121	12.4	0
HVAC122	12.8	0
HVAC123	7.8	0
HVAC124	7.9	0
HVAC125	8.2	0
HVAC126	8.0	0
HVAC127	8.2	0
HVAC128	8.2	0
HVAC129	8.3	0
HVAC130	6.7	0
HVAC131	8.0	0
HVAC132	8.1	0
HVAC133	8.2	0
HVAC134	8.5	0
HVAC135	8.5	0
HVAC136	8.7	0
HVAC137	15.3	0
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HVAC151	8.0	0
HVAC152	8.0	0
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HVAC155	8.0	0
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HVAC159	5.6	0
HVAC160	5.6	0
HVAC161	5.6	0
HVAC162	5.3	0
HVAC163	5.5	0
HVAC164	5.4	0
HVAC165	5.4	0
HVAC166	5.1	0
HVAC167	3.9	0
HVAC168	3.9	0
HVAC169	3.9	0
HVAC170	3.9	0
HVAC171	3.7	0
HVAC172	3.8	0

HVAC173			3.7	0
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HVAC1			14.8	0
HVAC2			14.6	0
HVAC3			14.5	0
HVAC4			14.2	0
HVAC5			14.2	0
HVAC6			14.3	0
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HVAC13			4.9	0
HVAC14			4.9	0
HVAC15			4.9	0
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HVAC35			8.4	0
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HVAC43			7.9	0
HVAC44			7.8	0
HVAC45			8.0	0
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HVAC52			6.5	0
HVAC53			6.4	0

HVAC54	6.5	0
HVAC55	7.7	0
HVAC56	6.0	0
HVAC57	6.0	0
HVAC58	6.1	0
HVAC59	6.1	0
HVAC60	6.3	0
HVAC61	7.1	0
HVAC62	5.5	0
HVAC63	5.5	0
HVAC64	6.2	0
HVAC65	6.4	0
HVAC66	6.6	0
HVAC67	7.2	0
HVAC68	5.8	0
HVAC69	5.8	0
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HVAC71	6.2	0
HVAC72	6.3	0
HVAC73	7.1	0
HVAC74	10.9	0
HVAC75	11.1	0
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HVAC77	10.8	0
HVAC78	10.6	0
HVAC79	10.2	0
HVAC80	11.0	0
HVAC81	10.9	0
HVAC82	10.7	0
HVAC83	10.5	0
HVAC84	10.4	0
HVAC85	10.1	0
HVAC86	12.1	0
HVAC87	12.0	0
HVAC88	12.2	0
HVAC89	12.4	0
HVAC90	12.6	0
HVAC91	13.2	0
HVAC92	14.5	0
HVAC93	14.3	0
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HVAC96	14.9	0
HVAC97	15.3	0
HVAC98	13.8	0
HVAC99	13.9	0
HVAC100	14.1	0
HVAC101	14.0	0
HVAC102	14.0	0
HVAC103	13.8	0
HVAC104	12.7	0
HVAC105	12.7	0
HVAC106	12.5	0
HVAC107	12.5	0
HVAC108	12.5	0

HVAC109	12.6	0
HVAC110	11.5	0
HVAC111	11.6	0
HVAC112	11.6	0
HVAC113	11.6	0
HVAC114	11.6	0
HVAC115	11.5	0
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HVAC133	8.3	0
HVAC134	8.6	0
HVAC135	8.7	0
HVAC136	8.8	0
HVAC137	15.4	0
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HVAC139	15.3	0
HVAC140	15.3	0
HVAC141	15.2	0
HVAC142	15.2	0
HVAC143	15.1	0
HVAC144	7.9	0
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HVAC161	6.2	0
HVAC162	7.4	0
HVAC163	7.3	0

HVAC164			7.1	0
HVAC165			7.0	0
HVAC166			6.9	0
HVAC167			7.2	0
HVAC168			7.1	0
HVAC169			7.0	0
HVAC170			7.0	0
HVAC171			6.7	0
HVAC172			6.6	0
HVAC173			6.5	0
14	1.Fl	33.6	0.0	
HVAC1			15.6	0
HVAC2			15.1	0
HVAC3			15.0	0
HVAC4			14.7	0
HVAC5			14.8	0
HVAC6			14.7	0
HVAC7			14.8	0
HVAC8			15.1	0
HVAC9			15.1	0
HVAC10			15.6	0
HVAC11			6.0	0
HVAC12			6.0	0
HVAC13			7.0	0
HVAC14			7.0	0
HVAC15			6.9	0
HVAC16			7.5	0
HVAC17			7.5	0
HVAC18			7.5	0
HVAC19			7.5	0
HVAC20			7.6	0
HVAC21			8.2	0
HVAC22			8.2	0
HVAC23			8.3	0
HVAC24			8.3	0
HVAC25			8.2	0
HVAC26			10.1	0
HVAC27			10.1	0
HVAC28			13.2	0
HVAC29			13.2	0
HVAC30			14.1	0
HVAC31			13.0	0
HVAC32			13.9	0
HVAC33			11.0	0
HVAC34			11.8	0
HVAC35			11.9	0
HVAC36			12.2	0
HVAC37			12.2	0
HVAC38			11.2	0
HVAC39			10.2	0
HVAC40			11.0	0
HVAC41			10.9	0
HVAC42			10.9	0
HVAC43			10.9	0
HVAC44			10.1	0

HVAC45	9.4	0
HVAC46	10.3	0
HVAC47	10.3	0
HVAC48	9.6	0
HVAC49	8.9	0
HVAC50	9.5	0
HVAC51	9.4	0
HVAC52	9.3	0
HVAC53	9.3	0
HVAC54	8.8	0
HVAC55	8.3	0
HVAC56	8.7	0
HVAC57	8.7	0
HVAC58	8.8	0
HVAC59	8.8	0
HVAC60	8.2	0
HVAC61	7.8	0
HVAC62	7.8	0
HVAC63	7.8	0
HVAC64	7.7	0
HVAC65	7.4	0
HVAC66	7.0	0
HVAC67	7.1	0
HVAC68	7.1	0
HVAC69	7.2	0
HVAC70	7.2	0
HVAC71	7.0	0
HVAC72	6.6	0
HVAC73	6.6	0
HVAC74	11.0	0
HVAC75	10.9	0
HVAC76	10.7	0
HVAC77	10.5	0
HVAC78	10.3	0
HVAC79	10.1	0
HVAC80	9.5	0
HVAC81	9.6	0
HVAC82	9.5	0
HVAC83	9.3	0
HVAC84	9.2	0
HVAC85	9.0	0
HVAC86	11.4	0
HVAC87	11.4	0
HVAC88	11.7	0
HVAC89	11.8	0
HVAC90	13.1	0
HVAC91	12.9	0
HVAC92	14.2	0
HVAC93	14.3	0
HVAC94	14.7	0
HVAC95	16.3	0
HVAC96	16.4	0
HVAC97	15.4	0
HVAC98	15.3	0
HVAC99	15.3	0

HVAC100	14.5	0
HVAC101	14.4	0
HVAC102	12.9	0
HVAC103	12.6	0
HVAC104	12.7	0
HVAC105	12.8	0
HVAC106	11.9	0
HVAC107	11.9	0
HVAC108	11.8	0
HVAC109	11.7	0
HVAC110	11.3	0
HVAC111	11.4	0
HVAC112	12.9	0
HVAC113	11.3	0
HVAC114	11.2	0
HVAC115	10.9	0
HVAC116	12.1	0
HVAC117	11.9	0
HVAC118	11.9	0
HVAC119	11.9	0
HVAC120	12.4	0
HVAC121	12.9	0
HVAC122	13.3	0
HVAC123	7.8	0
HVAC124	7.9	0
HVAC125	8.9	0
HVAC126	8.9	0
HVAC127	9.2	0
HVAC128	9.2	0
HVAC129	9.4	0
HVAC130	7.8	0
HVAC131	7.8	0
HVAC132	7.9	0
HVAC133	8.0	0
HVAC134	8.2	0
HVAC135	8.2	0
HVAC136	8.4	0
HVAC137	14.1	0
HVAC138	14.0	0
HVAC139	13.8	0
HVAC140	13.8	0
HVAC141	15.0	0
HVAC142	15.0	0
HVAC143	13.4	0
HVAC144	9.8	0
HVAC145	9.6	0
HVAC146	9.7	0
HVAC147	10.1	0
HVAC148	10.2	0
HVAC149	9.5	0
HVAC150	10.1	0
HVAC151	10.4	0
HVAC152	10.2	0
HVAC153	10.7	0
HVAC154	10.8	0

HVAC155		10.3	0
HVAC156		8.7	0
HVAC157		8.9	0
HVAC158		9.0	0
HVAC159		9.0	0
HVAC160		8.8	0
HVAC161		8.9	0
HVAC162		6.9	0
HVAC163		7.0	0
HVAC164		6.9	0
HVAC165		6.9	0
HVAC166		6.7	0
HVAC167		6.9	0
HVAC168		6.9	0
HVAC169		7.0	0
HVAC170		6.8	0
HVAC171		6.6	0
HVAC172		6.5	0
HVAC173		6.3	0
15 1.Fl	34.8	0.0	
HVAC1		20.9	0
HVAC2		19.4	0
HVAC3		19.0	0
HVAC4		18.6	0
HVAC5		19.0	0
HVAC6		18.7	0
HVAC7		18.8	0
HVAC8		19.8	0
HVAC9		20.2	0
HVAC10		21.8	0
HVAC11		0.1	0
HVAC12		0.1	0
HVAC13		-0.1	0
HVAC14		0.0	0
HVAC15		1.3	0
HVAC16		0.4	0
HVAC17		0.4	0
HVAC18		1.8	0
HVAC19		1.9	0
HVAC20		2.0	0
HVAC21		2.6	0
HVAC22		2.7	0
HVAC23		2.8	0
HVAC24		2.9	0
HVAC25		2.3	0
HVAC26		9.2	0
HVAC27		9.3	0
HVAC28		13.9	0
HVAC29		13.8	0
HVAC30		13.5	0
HVAC31		13.6	0
HVAC32		13.5	0
HVAC33		17.2	0
HVAC34		11.7	0
HVAC35		11.8	0

HVAC36	12.0	0
HVAC37	12.0	0
HVAC38	12.0	0
HVAC39	11.8	0
HVAC40	10.5	0
HVAC41	10.5	0
HVAC42	10.0	0
HVAC43	10.1	0
HVAC44	10.1	0
HVAC45	10.3	0
HVAC46	9.2	0
HVAC47	9.2	0
HVAC48	9.2	0
HVAC49	9.1	0
HVAC50	8.4	0
HVAC51	8.3	0
HVAC52	8.1	0
HVAC53	8.0	0
HVAC54	8.0	0
HVAC55	8.2	0
HVAC56	7.4	0
HVAC57	7.4	0
HVAC58	7.4	0
HVAC59	7.3	0
HVAC60	7.3	0
HVAC61	7.2	0
HVAC62	6.7	0
HVAC63	6.7	0
HVAC64	6.3	0
HVAC65	6.2	0
HVAC66	6.2	0
HVAC67	6.2	0
HVAC68	5.9	0
HVAC69	6.0	0
HVAC70	5.8	0
HVAC71	5.8	0
HVAC72	5.7	0
HVAC73	5.6	0
HVAC74	7.9	0
HVAC75	7.7	0
HVAC76	7.2	0
HVAC77	7.3	0
HVAC78	7.3	0
HVAC79	7.8	0
HVAC80	5.6	0
HVAC81	5.5	0
HVAC82	5.0	0
HVAC83	4.8	0
HVAC84	4.7	0
HVAC85	4.4	0
HVAC86	7.4	0
HVAC87	7.3	0
HVAC88	7.6	0
HVAC89	13.6	0
HVAC90	13.9	0

HVAC91	16.1	0
HVAC92	17.8	0
HVAC93	18.0	0
HVAC94	19.0	0
HVAC95	19.0	0
HVAC96	19.3	0
HVAC97	19.9	0
HVAC98	15.2	0
HVAC99	15.4	0
HVAC100	15.1	0
HVAC101	16.9	0
HVAC102	16.7	0
HVAC103	14.1	0
HVAC104	14.4	0
HVAC105	14.4	0
HVAC106	14.2	0
HVAC107	13.9	0
HVAC108	13.7	0
HVAC109	13.6	0
HVAC110	7.3	0
HVAC111	7.4	0
HVAC112	7.8	0
HVAC113	8.2	0
HVAC114	8.4	0
HVAC115	9.9	0
HVAC116	8.7	0
HVAC117	7.5	0
HVAC118	7.3	0
HVAC119	7.3	0
HVAC120	8.2	0
HVAC121	8.3	0
HVAC122	9.1	0
HVAC123	7.3	0
HVAC124	7.2	0
HVAC125	7.4	0
HVAC126	7.5	0
HVAC127	10.7	0
HVAC128	10.8	0
HVAC129	11.1	0
HVAC130	4.5	0
HVAC131	4.8	0
HVAC132	4.9	0
HVAC133	4.9	0
HVAC134	5.1	0
HVAC135	5.2	0
HVAC136	4.3	0
HVAC137	16.4	0
HVAC138	16.4	0
HVAC139	15.9	0
HVAC140	15.8	0
HVAC141	17.4	0
HVAC142	17.3	0
HVAC143	15.0	0
HVAC144	6.1	0
HVAC145	5.4	0

HVAC146		5.7	0
HVAC147		5.7	0
HVAC148		5.5	0
HVAC149		5.0	0
HVAC150		5.7	0
HVAC151		5.9	0
HVAC152		5.5	0
HVAC153		6.5	0
HVAC154		6.2	0
HVAC155		5.7	0
HVAC156		3.0	0
HVAC157		2.8	0
HVAC158		2.8	0
HVAC159		3.1	0
HVAC160		2.8	0
HVAC161		3.5	0
HVAC162		4.3	0
HVAC163		4.7	0
HVAC164		5.9	0
HVAC165		6.2	0
HVAC166		5.9	0
HVAC167		2.7	0
HVAC168		2.7	0
HVAC169		2.6	0
HVAC170		2.6	0
HVAC171		2.2	0
HVAC172		2.2	0
HVAC173		2.1	0
16 1.Fl	35.2	0.0	
HVAC1		20.2	0
HVAC2		17.1	0
HVAC3		17.0	0
HVAC4		14.9	0
HVAC5		15.1	0
HVAC6		22.3	0
HVAC7		21.6	0
HVAC8		22.0	0
HVAC9		22.1	0
HVAC10		25.6	0
HVAC11		-2.3	0
HVAC12		-2.3	0
HVAC13		-2.1	0
HVAC14		-2.2	0
HVAC15		-2.4	0
HVAC16		-1.9	0
HVAC17		-1.9	0
HVAC18		-2.2	0
HVAC19		-2.3	0
HVAC20		-2.7	0
HVAC21		-2.0	0
HVAC22		-2.0	0
HVAC23		-2.1	0
HVAC24		-2.2	0
HVAC25		-2.1	0
HVAC26		14.9	0

HVAC27	15.0	0
HVAC28	22.7	0
HVAC29	22.3	0
HVAC30	20.8	0
HVAC31	15.2	0
HVAC32	14.4	0
HVAC33	13.1	0
HVAC34	19.4	0
HVAC35	19.4	0
HVAC36	16.5	0
HVAC37	16.4	0
HVAC38	16.3	0
HVAC39	12.2	0
HVAC40	17.5	0
HVAC41	17.4	0
HVAC42	14.6	0
HVAC43	13.4	0
HVAC44	13.6	0
HVAC45	12.8	0
HVAC46	14.2	0
HVAC47	14.1	0
HVAC48	12.2	0
HVAC49	11.1	0
HVAC50	14.2	0
HVAC51	14.2	0
HVAC52	13.0	0
HVAC53	12.4	0
HVAC54	12.0	0
HVAC55	10.6	0
HVAC56	13.4	0
HVAC57	13.4	0
HVAC58	12.7	0
HVAC59	11.9	0
HVAC60	11.3	0
HVAC61	10.8	0
HVAC62	12.2	0
HVAC63	12.2	0
HVAC64	11.5	0
HVAC65	11.1	0
HVAC66	10.6	0
HVAC67	9.8	0
HVAC68	11.2	0
HVAC69	11.2	0
HVAC70	10.9	0
HVAC71	10.8	0
HVAC72	10.3	0
HVAC73	9.8	0
HVAC74	8.6	0
HVAC75	8.5	0
HVAC76	8.1	0
HVAC77	8.0	0
HVAC78	7.9	0
HVAC79	8.0	0
HVAC80	6.4	0
HVAC81	6.5	0

HVAC82	6.5	0
HVAC83	6.4	0
HVAC84	6.2	0
HVAC85	5.9	0
HVAC86	6.6	0
HVAC87	6.7	0
HVAC88	2.6	0
HVAC89	2.7	0
HVAC90	2.8	0
HVAC91	3.0	0
HVAC92	6.8	0
HVAC93	6.9	0
HVAC94	7.3	0
HVAC95	8.3	0
HVAC96	11.0	0
HVAC97	18.5	0
HVAC98	2.9	0
HVAC99	3.1	0
HVAC100	4.8	0
HVAC101	4.6	0
HVAC102	4.4	0
HVAC103	3.8	0
HVAC104	0.6	0
HVAC105	0.5	0
HVAC106	0.2	0
HVAC107	0.1	0
HVAC108	-0.1	0
HVAC109	-0.2	0
HVAC110	0.0	0
HVAC111	0.0	0
HVAC112	-0.1	0
HVAC113	-0.3	0
HVAC114	-0.5	0
HVAC115	-1.0	0
HVAC116	9.2	0
HVAC117	9.1	0
HVAC118	9.1	0
HVAC119	9.1	0
HVAC120	9.2	0
HVAC121	9.2	0
HVAC122	5.5	0
HVAC123	8.1	0
HVAC124	8.1	0
HVAC125	8.3	0
HVAC126	8.4	0
HVAC127	8.9	0
HVAC128	9.0	0
HVAC129	9.4	0
HVAC130	5.4	0
HVAC131	5.5	0
HVAC132	5.8	0
HVAC133	5.8	0
HVAC134	5.9	0
HVAC135	5.9	0
HVAC136	5.9	0

HVAC137		9.3	0
HVAC138		8.9	0
HVAC139		8.2	0
HVAC140		8.1	0
HVAC141		7.7	0
HVAC142		7.7	0
HVAC143		14.7	0
HVAC144		-0.9	0
HVAC145		-1.4	0
HVAC146		-1.2	0
HVAC147		3.7	0
HVAC148		3.7	0
HVAC149		-1.9	0
HVAC150		-1.5	0
HVAC151		-0.6	0
HVAC152		-1.0	0
HVAC153		-0.3	0
HVAC154		-0.4	0
HVAC155		-0.8	0
HVAC156		-2.3	0
HVAC157		-1.5	0
HVAC158		-1.2	0
HVAC159		-1.2	0
HVAC160		-1.7	0
HVAC161		-1.3	0
HVAC162		2.9	0
HVAC163		2.9	0
HVAC164		2.8	0
HVAC165		2.7	0
HVAC166		0.7	0
HVAC167		2.5	0
HVAC168		2.4	0
HVAC169		2.2	0
HVAC170		2.2	0
HVAC171		2.2	0
HVAC172		2.2	0
HVAC173		2.6	0
17 1.Fl	37.6	0.0	
HVAC1		17.3	0
HVAC2		17.6	0
HVAC3		18.0	0
HVAC4		17.3	0
HVAC5		19.9	0
HVAC6		24.7	0
HVAC7		24.5	0
HVAC8		22.2	0
HVAC9		21.8	0
HVAC10		20.4	0
HVAC11		-1.8	0
HVAC12		-1.9	0
HVAC13		-1.9	0
HVAC14		-1.9	0
HVAC15		-1.7	0
HVAC16		-0.4	0
HVAC17		-0.5	0

HVAC18	-0.6	0
HVAC19	-0.7	0
HVAC20	-0.7	0
HVAC21	0.5	0
HVAC22	0.6	0
HVAC23	0.6	0
HVAC24	0.5	0
HVAC25	0.2	0
HVAC26	17.9	0
HVAC27	17.0	0
HVAC28	22.4	0
HVAC29	22.2	0
HVAC30	25.2	0
HVAC31	24.8	0
HVAC32	23.4	0
HVAC33	22.4	0
HVAC34	22.3	0
HVAC35	22.9	0
HVAC36	25.4	0
HVAC37	17.4	0
HVAC38	15.9	0
HVAC39	14.3	0
HVAC40	18.5	0
HVAC41	18.5	0
HVAC42	16.5	0
HVAC43	15.7	0
HVAC44	15.0	0
HVAC45	14.3	0
HVAC46	16.7	0
HVAC47	14.1	0
HVAC48	13.2	0
HVAC49	12.1	0
HVAC50	17.4	0
HVAC51	17.3	0
HVAC52	14.1	0
HVAC53	13.3	0
HVAC54	12.7	0
HVAC55	11.0	0
HVAC56	14.7	0
HVAC57	14.8	0
HVAC58	14.1	0
HVAC59	12.9	0
HVAC60	11.9	0
HVAC61	10.7	0
HVAC62	13.7	0
HVAC63	13.4	0
HVAC64	12.2	0
HVAC65	11.7	0
HVAC66	11.2	0
HVAC67	10.1	0
HVAC68	13.0	0
HVAC69	13.0	0
HVAC70	11.9	0
HVAC71	11.2	0
HVAC72	10.6	0

HVAC73	10.0	0
HVAC74	12.4	0
HVAC75	9.4	0
HVAC76	11.7	0
HVAC77	11.2	0
HVAC78	10.7	0
HVAC79	10.1	0
HVAC80	6.9	0
HVAC81	7.0	0
HVAC82	7.1	0
HVAC83	7.0	0
HVAC84	6.9	0
HVAC85	6.6	0
HVAC86	7.3	0
HVAC87	7.5	0
HVAC88	7.8	0
HVAC89	7.8	0
HVAC90	7.9	0
HVAC91	7.9	0
HVAC92	21.1	0
HVAC93	22.5	0
HVAC94	18.5	0
HVAC95	17.2	0
HVAC96	16.8	0
HVAC97	11.2	0
HVAC98	16.7	0
HVAC99	16.7	0
HVAC100	16.3	0
HVAC101	16.0	0
HVAC102	15.7	0
HVAC103	15.1	0
HVAC104	4.7	0
HVAC105	4.6	0
HVAC106	4.3	0
HVAC107	4.1	0
HVAC108	3.9	0
HVAC109	-0.6	0
HVAC110	4.7	0
HVAC111	4.7	0
HVAC112	4.5	0
HVAC113	0.2	0
HVAC114	0.1	0
HVAC115	-0.8	0
HVAC116	10.2	0
HVAC117	10.0	0
HVAC118	15.6	0
HVAC119	15.8	0
HVAC120	10.2	0
HVAC121	10.3	0
HVAC122	10.7	0
HVAC123	7.6	0
HVAC124	7.5	0
HVAC125	7.6	0
HVAC126	7.6	0
HVAC127	7.9	0

HVAC128			7.9	0
HVAC129			8.3	0
HVAC130			6.1	0
HVAC131			6.2	0
HVAC132			6.5	0
HVAC133			6.6	0
HVAC134			7.4	0
HVAC135			7.5	0
HVAC136			8.1	0
HVAC137			8.1	0
HVAC138			8.1	0
HVAC139			7.8	0
HVAC140			7.8	0
HVAC141			6.9	0
HVAC142			6.7	0
HVAC143			6.4	0
HVAC144			-0.8	0
HVAC145			-1.2	0
HVAC146			-1.0	0
HVAC147			4.8	0
HVAC148			4.7	0
HVAC149			-1.7	0
HVAC150			-1.1	0
HVAC151			-0.3	0
HVAC152			-0.8	0
HVAC153			0.3	0
HVAC154			0.4	0
HVAC155			-0.4	0
HVAC156			-2.1	0
HVAC157			-1.4	0
HVAC158			-1.3	0
HVAC159			-0.9	0
HVAC160			-1.6	0
HVAC161			-0.9	0
HVAC162			1.2	0
HVAC163			1.3	0
HVAC164			1.3	0
HVAC165			1.3	0
HVAC166			-0.2	0
HVAC167			2.2	0
HVAC168			2.1	0
HVAC169			1.9	0
HVAC170			1.9	0
HVAC171			2.8	0
HVAC172			2.8	0
HVAC173			2.4	0
18	1.Fl	38.2	0.0	
HVAC1			12.8	0
HVAC2			11.3	0
HVAC3			13.0	0
HVAC4			11.8	0
HVAC5			12.0	0
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HVAC63	15.4	0

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HVAC49	10.7	0
HVAC50	20.0	0
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Priority Development Project (PDP)
Storm Water Quality Management Plan (SWQMP)

California Terraces - PA61

Permit No. TBD

[Insert Drawing Number (if applicable) and Internal Order Number (if applicable)]

☐ **Check if electing for offsite alternative compliance**

Engineer of Work:

Wayne W. Chang, PE 46548
Provide Wet Signature and Stamp Above Line

Prepared For:

Pardee Homes

13400 Sabre Springs Parkway, Suite 200

San Diego, CA 92128

(858) 794-2500

Prepared By:

Chang Consultants

P.O. Box 9496

Rancho Santa Fe, CA 92067

(858) 692-0760

Date:

September 19, 2018

Approved by: City of San Diego Date

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Project Name:

Table of Contents

- Attachment 3: Structural BMP Maintenance Plan
    - Maintenance Agreement (Form DS-3247) (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

Acronyms

APN	Assessor's Parcel Number
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CGP	Construction General Permit
DCV	Design Capture Volume
DMA	Drainage Management Areas
ESA	Environmentally Sensitive Area
GLU	Geomorphic Landscape Unit
GW	Ground Water
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
HU	Harvest and Use
INF	Infiltration
LID	Low Impact Development
LUP	Linear Underground/Overhead Projects
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
POC	Pollutant of Concern
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollutant Protection Plan
SWQMP	Storm Water Quality Management Plan
TMDL	Total Maximum Daily Load
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Program
WQIP	Water Quality Improvement Plan

Certification Page

Project Name: California Terraces - PA61
Permit Application

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and 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 the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Standards. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable source control and site design BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by the City Engineer is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

Will sign and stamp upon approval

Engineer of Work's Signature

46548 | 6/30/2019

PE# | Expiration Date

Wayne W. Chang

Print Name

Chang Consultants

Company

September 19, 2018

Date

Engineer's Stamp

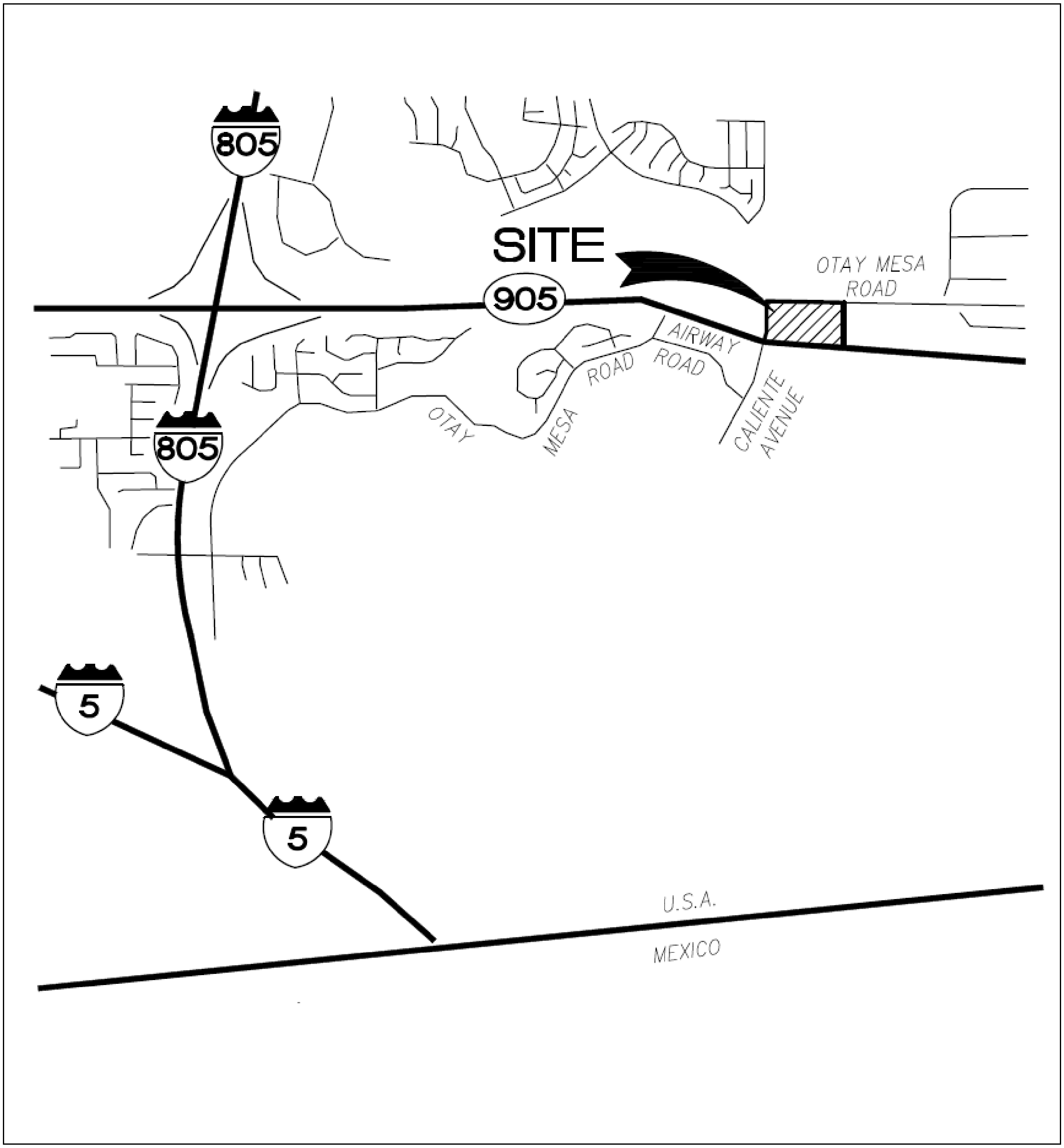
Submittal Record

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In last column indicate changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments.

Submittal Number	Date	Project Status	Changes
1	4/16/2018	☑ Preliminary Design/Planning/CEQA ☐ Final Design	**Initial Submittal**
2	7/10/2018	☑ Preliminary Design/Planning/CEQA ☐ Final Design	Second Submittal
3	9/19/2018	☑ Preliminary Design/Planning/CEQA ☐ Final Design	Third Submittal
4		☐ Preliminary Design/Planning/CEQA ☐ Final Design	

Project Vicinity Map

Project Name: California Terraces - PA 61
Permit Application TBD



City of San Diego Form DS-560 Storm Water Requirements Applicability Checklist

Attach DS-560 form.

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City of San Diego
Development Services
1222 First Ave., MS-302
San Diego, CA 92101
(619) 446-5000

Storm Water Requirements Applicability Checklist

FORM DS-560

OCTOBER 2016

Project Address: SE Corner of Otay Mesa Rd & Caliente Av, SD, 92108	Project Number *(for City Use Only)*:

SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1] , which is administered by the State Water Resources Control Board.

For all projects complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.

PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

   ❑ Yes; SWPPP required, skip questions 2-4 ❑ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity resulting in ground disturbance and contact with storm water runoff?

   ❑ Yes; WPCP required, skip 3-4 ❑ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)

   ❑ Yes; WPCP required, skip 4 ❑ No; next question

4. Does the project only include the following Permit types listed below?

   - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
   - Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
   - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb and gutter replacement, and retaining wall encroachments.

   ❑ Yes; no document required

Check one of the boxes below, and continue to PART B:

❑ If you checked "Yes" for question 1,
a SWPPP is REQUIRED. Continue to PART B

❑ If you checked "No" for question 1, and checked "Yes" for question 2 or 3,
a WPCP is REQUIRED. If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

❑ If you checked "No" for all questions 1-3, and checked "Yes" for question 4
PART B **does not apply and no document is required. Continue to Section 2.**

1. More information on the City's construction BMP requirements as well as CGP requirements can be found at: www.sandiego.gov/stormwater/regulations/index.shtml

PART B: Determine Construction Site Priority

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

Complete PART B and continued to Section 2

1. ❑ **ASBS**

a. Projects located in the ASBS watershed.

2. ❑ **High Priority**

a. Projects 1 acre or more determined to be Risk Level 2 or Risk Level 3 per the Construction General Permit and not located in the ASBS watershed.

b. Projects 1 acre or more determined to be LUP Type 2 or LUP Type 3 per the Construction General Permit and not located in the ASBS watershed.

3. ❑ **Medium Priority**

a. Projects 1 acre or more but not subject to an ASBS or high priority designation.

b. Projects determined to be Risk Level 1 or LUP Type 1 per the Construction General Permit and not located in the ASBS watershed.

4. ❑ **Low Priority**

a. Projects requiring a Water Pollution Control Plan but not subject to ASBS, high, or medium priority designation.

SECTION 2. Permanent Storm Water BMP Requirements.

Additional information for determining the requirements is found in the Storm Water Standards Manual.

PART C: Determine if Not Subject to Permanent Storm Water Requirements.

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

If "yes" is checked for any number in Part C, proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".

If "no" is checked for all of the numbers in Part C continue to Part D.

1.	Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?	❑ Yes ❑ No
2.	Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?	❑ Yes ❑ No
3.	Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).	❑ Yes ❑ No

Clear Page 2

PART D: PDP Exempt Requirements.

PDP Exempt projects are required to implement site design and source control BMPs.

If "yes" was checked for any questions in Part D, continue to Part F and check the box labeled "PDP Exempt."

If "no" was checked for all questions in Part D, continue to Part E.

1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:

- **Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;**
- **Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;**
- **Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?**

❑ Yes; PDP exempt requirements apply ❑ No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

❑ Yes; PDP exempt requirements apply ❑ No; project not exempt.

PART E: Determine if Project is a Priority Development Project (PDP).

Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

If "yes" is checked for any number in PART E, continue to PART F and check the box labeled "Priority Development Project".

If "no" is checked for every number in PART E, continue to PART F and check the box labeled "Standard Development Project".

1.	**New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	❑ Yes ❑ No
2.	**Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	❑ Yes ❑ No
3.	**New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface.	❑ Yes ❑ No
4.	**New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater.	❑ Yes ❑ No
5.	**New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).**	❑ Yes ❑ No
6.	**New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	❑ Yes ❑ No

Clear Page 3

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). ❑ Yes ❑ No

8. **New development or redevelopment projects of a retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. ❑ Yes ❑ No

9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ❑ Yes ❑ No

10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces. ❑ Yes ❑ No

PART F: Select the appropriate category based on the outcomes of PART C through PART E.

1. The project is **NOT SUBJECT TO PERMANENT STORM WATER REQUIREMENTS**. ❑
2. The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ❑
3. The project is **PDP EXEMPT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ❑
4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires a hydromodification plan management ❑

Name of Owner or Agent *(Please Print)*	Title
Signature	Date

Clear Page 4

Clear Form

Applicability of Permanent, Post-Construction Storm Water BMP Requirements			Form I-1
Project Identification			
Project Name: California Terraces - PA61			
Permit Application Number: TBD			Date: September 19, 2018
Determination of Requirements			
The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements. Answer each step below, starting with **Step 1** and progressing through each step until reaching "Stop". Refer to the manual sections and/or separate forms referenced in each step below.			
Step	**Answer**	**Progression**	
Step 1: Is the project a "development project"? See Section 1.3 of the manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	Go to **Step 2**.	
	☐ No	**Stop.** Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.	
Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building):			
Step 2: Is the project a Standard Project, PDP, or PDP Exempt? To answer this item, see Section 1.4 of the manual in its entirety for guidance AND complete Form DS-560, Storm Water Requirements Applicability Checklist.	☐ Standard Project	**Stop.** Standard Project requirements apply	
	☑ PDP	PDP requirements apply, including PDP SWQMP. Go to **Step 3**.	
	☐ PDP Exempt	**Stop.** Standard Project requirements apply. Provide discussion and list any additional requirements below.	
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:			

Project Name:

Form I-1 Page 2 of 2		
Step	**Answer**	**Progression**
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to **Step 4**.
	☐ No	BMP Design Manual PDP requirements apply. Go to **Step 4**.
Discussion / justification of prior lawful approval, and identify requirements (<u>not required if prior lawful approval does not apply</u>):		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to **Step 5**.
	☐ No	**Stop**. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do <u>not</u> apply:		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). **Stop**.
	☐ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. **Stop**.
Discussion / justification if protection of critical coarse sediment yield areas does <u>not</u> apply: The San Diego County Regional Watershed Management Area Analysis (WMAA) and associated Google Earth kmz overlay do not map CCSYA's at the site.		

HMP Exemption Exhibit

Attach a HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information and exempt waterbody.
Reference applicable drawing number(s).

Exhibit must be provided on 11"x17" or larger paper.

N/A. The project is not exempt.

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Project Name:

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	California Terraces - PA61
Project Address	Southeast corner of Otay Mesa Road and Caliente Avenue, San Diego, CA 92154
Assessor's Parcel Number(s) (APN(s))	645-080-16-00
Permit Application Number	TBD
Project Watershed	Select One: ☐ San Dieguito River ☐ Penasquitos ☐ Mission Bay ☐ San Diego River ☐ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	Otay Valley Hydrologic Area (910.20)
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	15.62 Acres (680,544 Square Feet)
Area to be disturbed by the project (Project Footprint)	14.87 Acres (647,543 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	7.84 Acres (341,630 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	7.02 Acres (305,913 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition	> 100 %

Project Name:

Form I-3B Page 2 of 11
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply): ☐Existing development ☐Previously graded but not built out ☑Agricultural or other non-impervious use ☐Vacant, undeveloped/natural Description / Additional Information: The site has been disturbed in the past, but not developed.
Existing Land Cover Includes (select all that apply): ☑Vegetative Cover ☐Non-Vegetated Pervious Areas ☐Impervious Areas Description / Additional Information: The site contains naturally-occurring vegetation consisting of low lying brush and grasses.
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☐NRCS Type A ☐NRCS Type B ☐NRCS Type C ☑NRCS Type D
Approximate Depth to Groundwater: ☐ Groundwater Depth < 5 feet ☐ 5 feet < Groundwater Depth < 10 feet ☐ 10 feet < Groundwater Depth < 20 feet ☐ Groundwater Depth > 20 feet
Existing Natural Hydrologic Features (select all that apply): ☐Watercourses ☐Seeps ☐Springs ☐Wetlands ☑None Description / Additional Information: The site is a gently sloping pad containing no natural hydrologic features.

Form I-3B Page 3 of 11
Description of Existing Site Topography and Drainage
How is storm water runoff conveyed from the site? At a minimum, this description should answer: 1. Whether existing drainage conveyance is natural or urban; 2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site; 3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels; 4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.
Descriptions/Additional Information
Storm runoff from the site sheet flows over the gently sloping, natural ground surface. The majority of the sheet flow is directed to the east and onto the adjacent parcel. The on- and off-site runoff continue easterly as sheet flow towards a small watercourse approximately 1,400 feet east of the site. There is a historic pond that was graded within the northeast corner of the site that captures precipitation within its footprint. The remaining site runoff is directed towards the northwest corner of the site (towards the intersection of Otay Mesa Road and Caliente Avenue) and into an existing storm drain system. There are no other existing on-site drainage facilities. There is minimal off-site run-on. The drainage report in Attachment 5 summarizes the pre- and post-project drainage areas and flow rates.

Form I-3B Page 4 of 11
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities: The project proposes up to 45,000 sf of commercial uses within Lot 1 (westerly lot). It also proposes 171 multi-family residential units including 18 affordable and a private recreation park within Lot 2 on the easterly two-thirds of the site. The residential development permits up to 270 multi-family residential units on Lot 2. For this residential development area, there are two proposed public streets off of Otay Mesa Road that provide access to the east and west ends of the project, as well as private on-site driveways, alleys, and parking. The westerly third of the site (Lot 1) will be mass-graded and developed in the future under a separate Planned Development Permit and Site Development Permit.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): The proposed impervious features include the condominium buildings, public streets, private driveways and alleys, parking, curb, gutter, sidewalk, trash enclosures, and hardscape.
List/describe proposed pervious features of the project (e.g., landscape areas): The proposed pervious features include landscaping and the recreation park within the residential development as well as the westerly mass-graded pad.
Does the project include grading and changes to site topography? ☑ Yes ☐ No Description / Additional Information: The existing site is gently sloping, but grading will be required for the project. The cut and fill heights will not be large since the site does not have much relief.

Form I-3B Page 5 of 11
Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)? ☐ Yes ☐ No If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural and constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations. Description / Additional Information: Storm runoff from the condominium development will flow off the proposed roofs and adjacent hardscape onto surrounding landscaping areas for dispersion, where feasible. The project runoff will be conveyed by the private alleys and driveways to on-site storm drain systems. The majority of the runoff will be conveyed towards the northeast corner of the site where the proposed on-site storm drain will connect to an existing storm drain in Otay Mesa Road. The storm drain continues east of the site nearly 500 feet, then outlets into a natural drainage within Dennery Canyon on the north site of Otay Mesa Road. Storm runoff from the northwest corner of the condominium project will be conveyed by the proposed streets and storm drain system to an existing storm drain system at the intersection of Caliente Avenue and Otay Mesa Road. The existing storm drain system crosses Otay Mesa Road and continues north along Ocean View Hills Parkway (Ocean View Hills Parkway is named Caliente Avenue south of Otay Mesa Road) before outletting into a natural drainage within Dennery Canyon. Both natural drainages continue north within Dennery Canyon, confluence, and ultimately flow into the Otay River. The condominium project storm water will be treated by proposed Modular Wetland System Linear BMPs, while hydromodification and detention requirements will be met with underground vaults. Storm runoff from the westerly mass-graded pad will enter the same storm drain system as the northwest portion of the condominium site. The mass-graded pad will be a self-mitigating area. The drainage report in Attachment 5 provides hydrologic analyses for the project including drainage areas and flow rates.

Project Name:

Form I-3B Page 6 of 11
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply): ☑ Onsite storm drain inlets ☐ Interior floor drains and elevator shaft sump pumps ☐ Interior parking garages ☑ Need for future indoor & structural pest control ☑ Landscape/outdoor pesticide use ☐ Pools, spas, ponds, decorative fountains, and other water features ☐ Food service ☑ Refuse areas ☐ Industrial processes ☐ Outdoor storage of equipment or materials ☐ Vehicle and equipment cleaning ☐ Vehicle/equipment repair and maintenance ☐ Fuel dispensing areas ☐ Loading docks ☑ Fire sprinkler test water ☑ Miscellaneous drain or wash water ☑ Plazas, sidewalks, and parking lots Description/Additional Information: The project will construct private on-site drainage systems with a series of downspouts, inlets, and pipes. Pest control will be used for indoor and outdoor areas, as needed. The project will include designated refuse storage areas. Fire sprinklers will be installed per code. The buildings will generate miscellaneous drain and wash water typical of condominiums. The project will include hardscaping, sidewalks, and parking.

Project Name:

Form I-3B Page 7 of 11
Identification and Narrative of Receiving Water
Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable)
The project runoff will be conveyed by on-site drainage facilities that connect to two existing storm drain systems in Otay Mesa Road. The existing storm drain systems outlet at two separate locations into Dennery Canyon north of site. The runoff is conveyed north down the canyon to the Otay River, which is over 1.5 miles north of the site. The Otay River continues west over 4.6 miles to San Diego Bay.
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations
The existing beneficial uses from the 2011 "Water Quality Control Plan for the San Diego Basin" (Otay Mesa Hydrologic Area 910.20) for inland surface waters include AGR, REC2, WARM, and WILD. The potential beneficial uses are IND and REC1. The existing groundwater beneficial uses are MUN, AGR, and IND.
Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations
There are no ASBS receiving waters downstream of the project discharge locations.
Provide distance from project outfall location to impaired or sensitive receiving waters
The project runoff ultimately enters the southerly end of San Diego Bay, which is approximately 4.8 miles west of the project outfalls and impaired for PCBs.
Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands
Dennery Canyon is located just north of Otay Mesa Road and the project site. Dennery Canyon is within the City's MHPA and contains associated vegetation communities.

Project Name:

Form I-3B Page 8 of 11		
Identification of Receiving Water Pollutants of Concern		
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:		
303(d) Impaired Water Body (Refer to Appendix K)	**Pollutant(s)/Stressor(s) (Refer to Appendix K)**	**TMDLs/WQIP Highest Priority Pollutant (Refer to Table 1-4 in Chapter 1)**
San Diego Bay	PCBs	Per the 2010 303(d) list, TMDLs
		are req'd, but not completed.
		The highest priority pollutants
		are indicator bacteria, dissolved
		copper, lead, and zinc.

Identification of Project Site Pollutants*			
*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated) Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see Appendix B.6):			
Pollutant	**Not Applicable to the Project Site**	**Anticipated from the Project Site**	**Also a Receiving Water Pollutant of Concern**
Sediment	☐	☑	☐
Nutrients	☐	☑	☐
Heavy Metals	☐	☑	☐
Organic Compounds	☐	☑	☐
Trash & Debris	☐	☑	☐
Oxygen Demanding Substances	☐	☑	☐
Oil & Grease	☐	☑	☐
Bacteria & Viruses	☐	☑	☐
Pesticides	☐	☑	☐

Project Name:

Form I-3B Page 9 of 11
Hydromodification Management Requirements
Do hydromodification management requirements apply (see Section 1.6)? ☐ Yes, hydromodification management flow control structural BMPs required. ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides. Description / Additional Information (to be provided if a 'No' answer has been selected above): Note: If "No" answer has been selected the SWQMP must include an exhibit that shows the storm water conveyance system from the project site to an exempt water body. The exhibit should include details about the conveyance system and the outfall to the exempt water body.
Critical Coarse Sediment Yield Areas* ***This Section only required if hydromodification management requirements apply**
Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint? ☐ Yes ☐ No Discussion / Additional Information: The San Diego County Regional Watershed Management Area Analysis (WMAA) and associated Google Earth kmz overlay do not map CCSYA's at the site.

Form I-3B Page 10 of 11
Flow Control for Post-Project Runoff* ***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. The project runoff will be conveyed away from the site by two existing storm drain systems in Otay Mesa Road. The easterly portion of the site will flow into an existing storm drain at the northeast corner of the site. The storm drain continues east along Otay Mesa Road approximately 400 feet, then outlets into Dennery Canyon on the north side of the street. This is the Easterly POC. The westerly portion of the site will flow into an existing storm drain at the northwest corner of the site. The storm drain continues north across Otay Mesa Road, then over 800 feet north along Ocean View Hills Parkway before outletting into Dennery Canyon on the east side of Ocean View Hills Parkway. This is the Westerly POC.
Has a geomorphic assessment been performed for the receiving channel(s)? ☐ No, the low flow threshold is $0.1Q_2$ (default low flow threshold) ☐ Yes, the result is the low flow threshold is $0.1Q_2$ ☐ Yes, the result is the low flow threshold is $0.3Q_2$ ☐ Yes, the result is the low flow threshold is $0.5Q_2$ If a geomorphic assessment has been performed, provide title, date, and preparer: A geomorphic assessment has not been performed for this preliminary SWQMP submittal. An assessment could be performed in the future.
Discussion / Additional Information: (optional) N/A

Form I-3B Page 11 of 11
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.
The westerly Lot 1 will be developed with a commercial use (up to 45,000 sf) in the future. Lot 1 will remain a self-mitigating area under this current project. BMPs for the ultimate commercial use will be outlined in a future SWQMP when that project is developed. For this current project, the self-mitigating area will meet the following requirements:
Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.
• Vegetation in the natural or landscaped area is native and/or non-native/ non-invasive drought tolerant species that do not require regular application of fertilizers and pesticides. • Soils are undisturbed native topsoil, or disturbed soils that have been amended and aerated to promote water retention characteristics equivalent to undisturbed native topsoil. • The incidental impervious areas are less than 5 percent of the self-mitigating area. • Impervious area within the self-mitigated area should not be hydraulically connected to other impervious areas unless it is a storm water conveyance system (such as brow ditches). • The self-mitigating area is hydraulically separate from DMAs that contain permanent storm water pollutant control BMPs.

Project Name:

Source Control BMP Checklist for PDPs	Form I-4B		
Source Control BMPs			
All development projects must implement source control BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.3 not implemented:			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.4 not implemented:			
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.5 not implemented:			

Project Name:

Form I-4B Page 2 of 2			
Source Control Requirement	**Applied?**		
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☐ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☐ Yes	☐ No	☐ N/A
Interior parking garages	☐ Yes	☐ No	☐ N/A
Need for future indoor & structural pest control	☐ Yes	☐ No	☐ N/A
Landscape/Outdoor Pesticide Use	☐ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☐ N/A
Food service	☐ Yes	☐ No	☐ N/A
Refuse areas	☐ Yes	☐ No	☐ N/A
Industrial processes	☐ Yes	☐ No	☐ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☐ N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☐ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☐ N/A
Loading Docks	☐ Yes	☐ No	☐ N/A
Fire Sprinkler Test Water	☐ Yes	☐ No	☐ N/A
Miscellaneous Drain or Wash Water	☐ Yes	☐ No	☐ N/A
Plazas, sidewalks, and parking lots	☐ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☐ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☐ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☐ N/A
SC-6D: Automotive Facilities	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.			

Project Name:

Site Design BMP Checklist for PDPs			Form I-5B
Site Design BMPs			
All development projects must implement site design BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided. A site map with implemented site design BMPs must be included at the end of this checklist.			
Site Design Requirement	**Applied?**		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.1 not implemented: The site has previously been disturbed, so contains no natural pathways or hydrologic features. Trees are not currently implemented for this preliminary SWQMP, but could be implemented during final engineering.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐ Yes	☐ No	☐ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☐ N/A
1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☐ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☐ N/A
4.3.2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.2 not implemented: The site has previously been disturbed and cleared, but currently contains naturally-occurring low-lying vegetation (brush and grasses). The site will be entirely cleared and grubbed as part of development.			

Project Name:

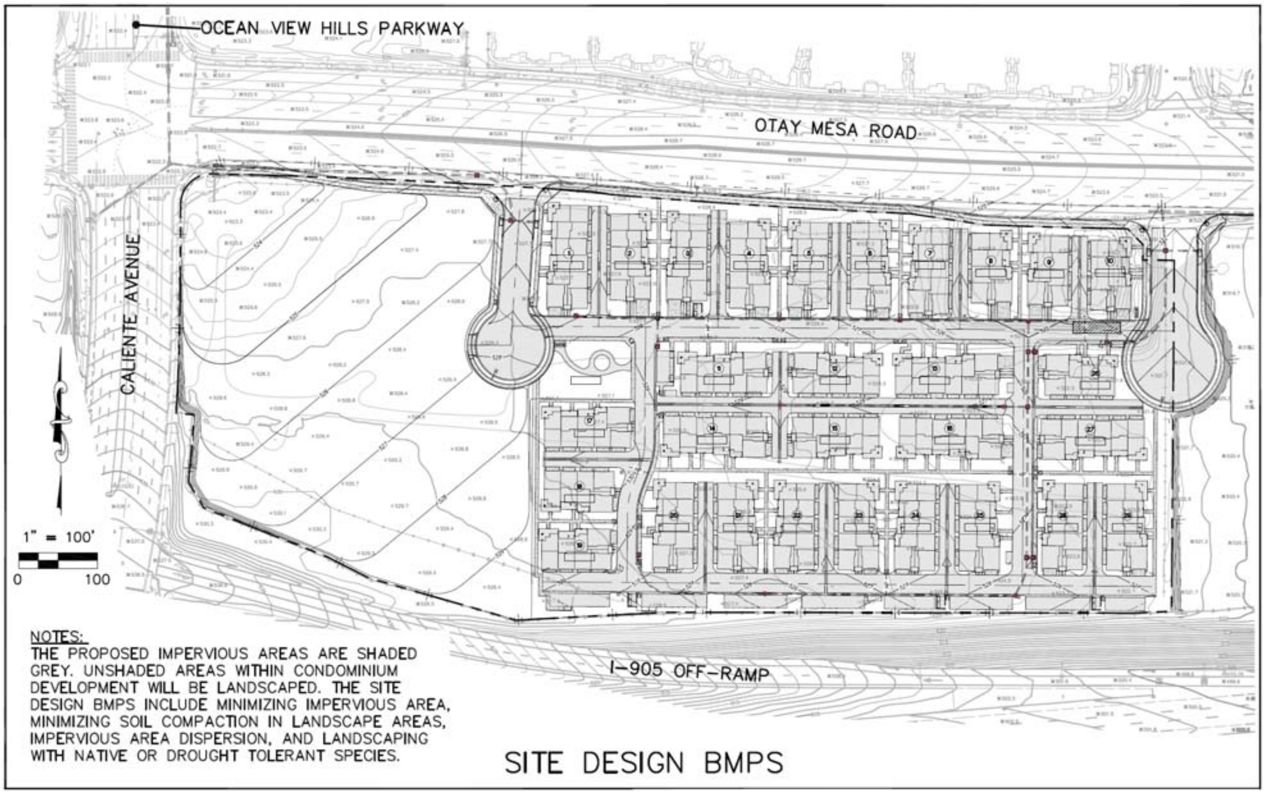
Form I-5B Page 2 of 4			
Site Design Requirement	**Applied?**		
4.3.3 Minimize Impervious Area	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.3 not implemented:			
4.3.4 Minimize Soil Compaction	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.5 not implemented:			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☐ Yes	☐ No	☐ N/A
5-2 Does the pervious area satisfy the design criteria in 4.3.5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☐ Yes	☐ No	☐ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E?	☐ Yes	☐ No	☐ N/A

Project Name:

Form I-5B Page 3 of 4			
Site Design Requirement	Applied?		
4.3.6 Runoff Collection	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.6 not implemented: Green roofs and permeable pavement are not proposed. The post-construction structural treatment (pollutant) control BMPs selected are Bio Clean Environmental Services, Inc.'s Modular Wetland System (MWS) Linear units.			
6a-1 Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☐ N/A
6a-2 Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E?	☐ Yes	☐ No	☐ N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☐ N/A
6b-2 Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E?	☐ Yes	☐ No	☐ N/A
4.3.7 Landscaping with Native or Drought Tolerant Species	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvest and Use Precipitation	☐ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.8 not implemented: Harvest and use is considered to be infeasible per Form I-7 from the City "Storm Water Standards, Part 1: BMP Design Manual - Appendices." The harvest and use assessment is included in Attachment 1c.			
8-1 Are rain barrels implemented in accordance with design criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☐ N/A
8-2 Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E?	☐ Yes	☐ No	☐ N/A

Form I-5B Page 4 of 4

Insert Site Map with all site design BMPs identified:



Project Name:

Summary of PDP Structural BMPs	Form I-6
PDP Structural BMPs	
All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s). PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual). Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).	
Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. The project must meet pollutant control and flow control requirements. The City of San Diego's 2016 "Storm Water Standards" outlines steps in selecting structural BMPs. Harvest and use is considered first. Per Attachment 1c, harvest and use is not feasible for the project. Infiltration is considered next. Both full and partial infiltration were determined to be infeasible per Geocon's March 15, 2018, "Update Geotechnical Investigation," in Attachment 6. The report determined low infiltration rates and the potential for undesirable impacts on downstream properties. The proposed condition runoff will be treated by Modular Wetland System (MWS) Linear BMPs, which are TAPE certified. An MWS Linear BMP will be installed at five locations. One MWS Linear will serve the majority of the easterly area runoff. An additional MWS Linear will be installed in each of the two inlets in Street B, which is the easterly access to the site from Otay Mesa Road. Finally, an MWS Linear will be installed in each of the two inlets in Street A, which is the westerly access to the site from Otay Mesa Road. Underground storage vaults will be used to meet flow control requirements. (Continue on page 2 as necessary.)	

Project Name:

Form I-6 Page 2 of
(Continued from page 1)

Project Name: California Terraces – PA61

Form I-6 Page 1 of 2 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. 1 through 5	
Construction Plan Sheet No. 5	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☑ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☑ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	TBD during final engineering
Who will be the final owner of this BMP?	HOA for BMP 1, City Transportation and Stormwater Dept. for BMP 2 through 5.
Who will maintain this BMP into perpetuity?	HOA for BMP 1, City Transportation and Stormwater Dept. for BMP 2 through 5.
What is the funding mechanism for maintenance?	Developer initially, then HOA after development for BMP 1 or City for BMP 2-5.

Project Name:

Form I-6 Page 2 of (Copy as many as needed)
Structural BMP ID No. 1 through 5
Construction Plan Sheet No. 5
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): Five MWS Linear BMPs and associated underground vaults are the proposed pollutant control and flow control BMPs for the project. Since this is a preliminary SWQMP, all five are combined in one Form I-6. During final engineering, a separate Form I-6 will be provided for each structural BMP.

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Attachment 1
Backup For PDP Pollutant Control BMPs

This is the cover sheet for Attachment 1.

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Project Name:

Indicate which Items are Included:

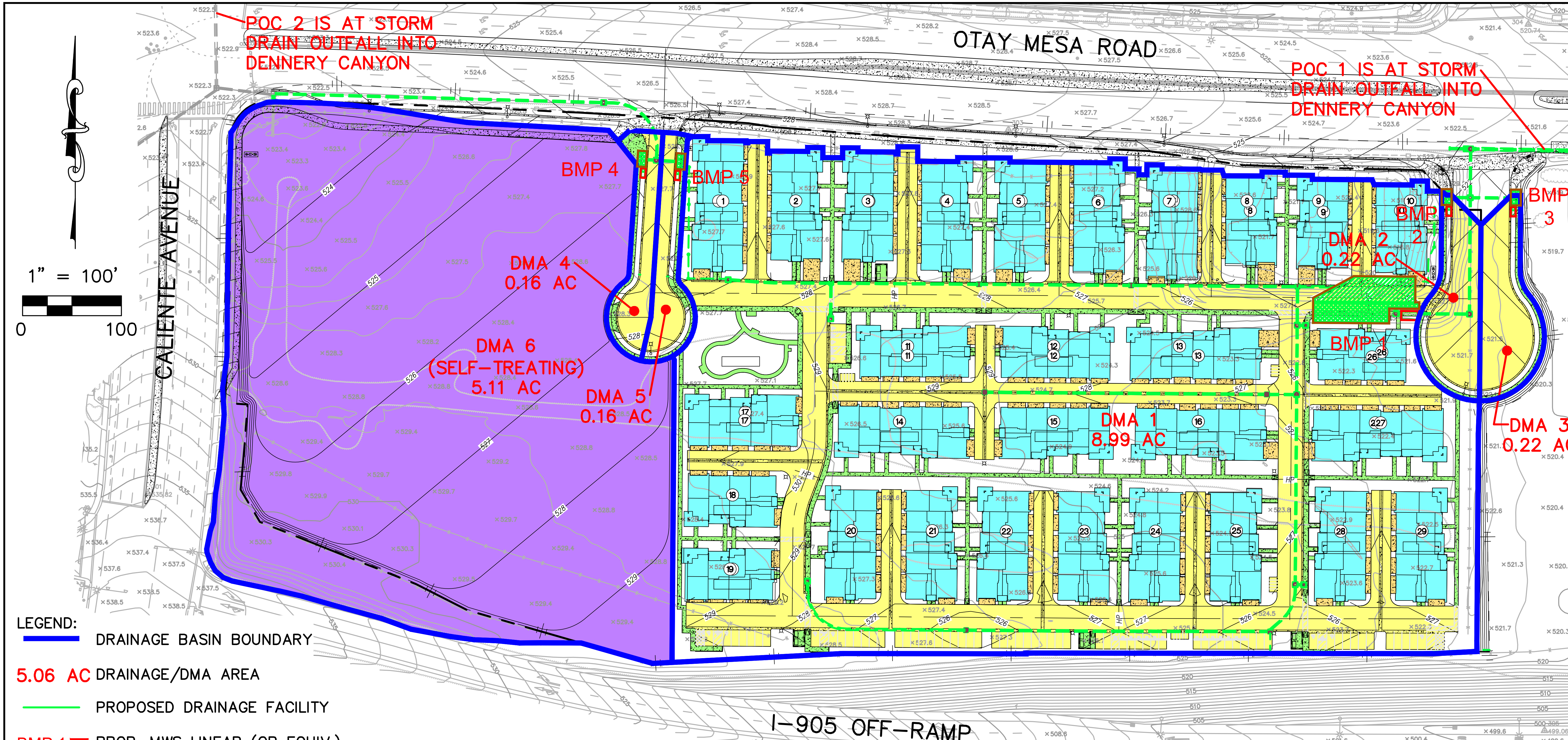
Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☒ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☐ Included on DMA Exhibit in Attachment 1a ☑ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☑ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Infiltration Feasibility Information. Contents of Attachment 1d depend on the infiltration condition: • No Infiltration Condition: ○ Infiltration Feasibility Condition Letter (*Note: must be stamped and signed by licensed geotechnical engineer*) ○ Form I-8A (optional) ○ Form I-8B (optional) • Partial Infiltration Condition: ○ Infiltration Feasibility Condition Letter (*Note: must be stamped and signed by licensed geotechnical engineer*) ○ Form I-8A ○ Form I-8B • Full Infiltration Condition: ○ Form I-8A ○ Form I-8B ○ Worksheet C.4-3 ○ Form I-9 Refer to Appendices C and D of the BMP Design Manual for guidance.	☑ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☑ Included

Project Name:

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

- ☑ Underlying hydrologic soil group
- ☑ Approximate depth to groundwater
- ☑ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☑ Critical coarse sediment yield areas to be protected
- ☑ Existing topography and impervious areas
- ☑ Existing and proposed site drainage network and connections to drainage offsite
- ☑ Proposed grading
- ☑ Proposed impervious features
- ☑ Proposed design features and surface treatments used to minimize imperviousness
- ☑ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- ☑ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
- ☑ Structural BMPs (identify location, type of BMP, size/detail, and include cross-section)



LEGEND:

DRAINAGE BASIN BOUNDARY

5.06 AC DRAINAGE/DMA AREA

PROPOSED DRAINAGE FACILITY

BMP 1 PROP. MWS LINEAR (OR EQUIV.)

PROP. FLOW CONTROL VAULT

PROPOSED BUILDINGS

PROPOSED STREETS

PROPOSED DRIVEWAYS

PROPOSED HARDSCAPE

PROPOSED LANDSCAPING

PROPOSED SELF-MITIGATING AREA

NOTES:

THE UNDERLYING HYDROLOGIC SOIL GROUP IS D. GROUNDWATER WAS NOT ENCOUNTERED IN BORINGS UP TO 17' DEEP. THERE ARE NO EXISTING ON-SITE NATURAL HYDROLOGIC FEATURES, CCSYA, OR IMPERVIOUS AREAS.

SELF-MITIGATING AREA SHALL MEET "STORM WATER STANDARDS" REQUIREMENTS IN SECTIONS 5.2.1 AND 5.2.3.

PROPOSED IMPROVEMENTS ALONG OTAY MESA ROAD WILL MEET GREEN STREET REQUIREMENTS.

THIS SWQMP IS PRELIMINARY AND FOR ENTITLEMENTS. AN APPROVED EQUIVALENT TO MWS LINEAR CAN BE SELECTED DURING FINAL ENGINEERING. THE VAULT VOLUMES ARE ESTIMATED IN THIS SWQMP. THE VAULT DETAILS WILL BE DESIGNED DURING FINAL ENGINEERING. THE FLOW CONTROL DISCHARGE OUT OF EACH VAULT SHALL MATCH THE HYDROMODIFICATION FLOW RATE.

Vault Dimensions

BMP	Depth, ft	Length, ft	Width, ft	Volume, ft
1	4 to 9	Varies	Varies	29,400
2	6	9	15	810
3	6	9	15	810
4	5	8	15	600
5	5	8	15	600

ATTACHMENT 1A AND 2A

DMA AND HYDROMODIFICATION MANAGEMENT EXHIBIT

ATTACHMENT 1B - TABULAR SUMMARY OF DMAs

Design Capture Volume

DMA 1		DMA 2		DMA 3		DMA 4		DMA 5	
85th %, in	0.48	85th %, in	0.48	85th %, in	0.48	85th %, in	0.48	85th %, in	0.48
Area, ac	8.99	Area, ac	0.22	Area, ac	0.22	Area, ac	0.16	Area, ac	0.16
C	0.74	C	0.81	C	0.80	C	0.79	C	0.78
DCV, cf	11,587	DCV, cf	310	DCV, cf	304	DCV, cf	222	DCV, cf	217
Pervious, sf	78,644	Pervious, sf	1,029	Pervious, sf	1,194	Pervious, sf	971	Pervious, sf	1,059
Impervious, sf	313,127	Impervious, sf	8,491	Impervious, sf	8,320	Impervious, sf	6,064	Impervious, sf	5,909
Total, sf	391,771	Total, sf	9,520	Total, sf	9,514	Total, sf	7,035	Total, sf	6,968

Pervious and Impervious Areas

DMA 1		DMA 2		DMA 3		DMA 4		DMA 5	
Item	Area, sf	Item	Area, sf	Item	Area, sf	Item	Area, sf	Item	Area, sf
Roofs	164,413	Roofs	0	Roofs	0	Roofs	0	Roofs	0
Hardscape	24,999	Hardscape	1,091	Hardscape	1,236	Hardscape	1,853	Hardscape	1,567
Streets	106,336	Streets	7,400	Streets	7,084	Streets	4,211	Streets	4,342
Driveways	17,379	Driveways	0	Driveways	0	Driveways	0	Driveways	0
Total	313,127	Total	8,491	Total	8,320	Total	6,064	Total	5,909

Project Name: California Terraces - PA61

Tabular Summary of DMAs							Worksheet B-1		
DMA Unique Identifier	Area (acres)	Impervious Area (acres)	% Imp	HSG	Area Weighted Runoff Coefficient	DCV (cubic feet)	Treated By (BMP ID)	Pollutant Control Type	Drains to (POC ID)
1	8.99	7.19	79.9	D	0.74	11,587	BMP 1	MWS-L	East
2	0.22	0.19	89.2	D	0.81	310	BMP 2	MWS-L	East
3	0.22	0.19	87.5	D	0.80	304	BMP 3	MWS-L	East
4	0.16	0.14	86.2	D	0.79	222	BMP 4	MWS-L	West
5	0.16	0.14	84.8	D	0.78	217	BMP 5	MWS-L	West
Self-Mit.	5.11	0	0	D	0.10	878	Self-Mitgating	N/A	West
Summary of DMA Information (Must match project description and SWQMP Narrative)									
No. of DMAs	Total DMA Area (acres)	Total Impervious Area (acres)	% Imp		Area Weighted Runoff Coefficient	Total DCV (cubic feet)	Total Area Treated (acres)		No. of POCs
6	14.79	7.85	53.1		0.52	13,519	14.79		2

Where: DMA = Drainage Management Area; Imp = Imperviousness; HSG = Hydrologic Soil Group; DCV= Design Capture Volume; BMP = Best Management Practice; POC = Point of Compliance; ID = identifier; No. = Number

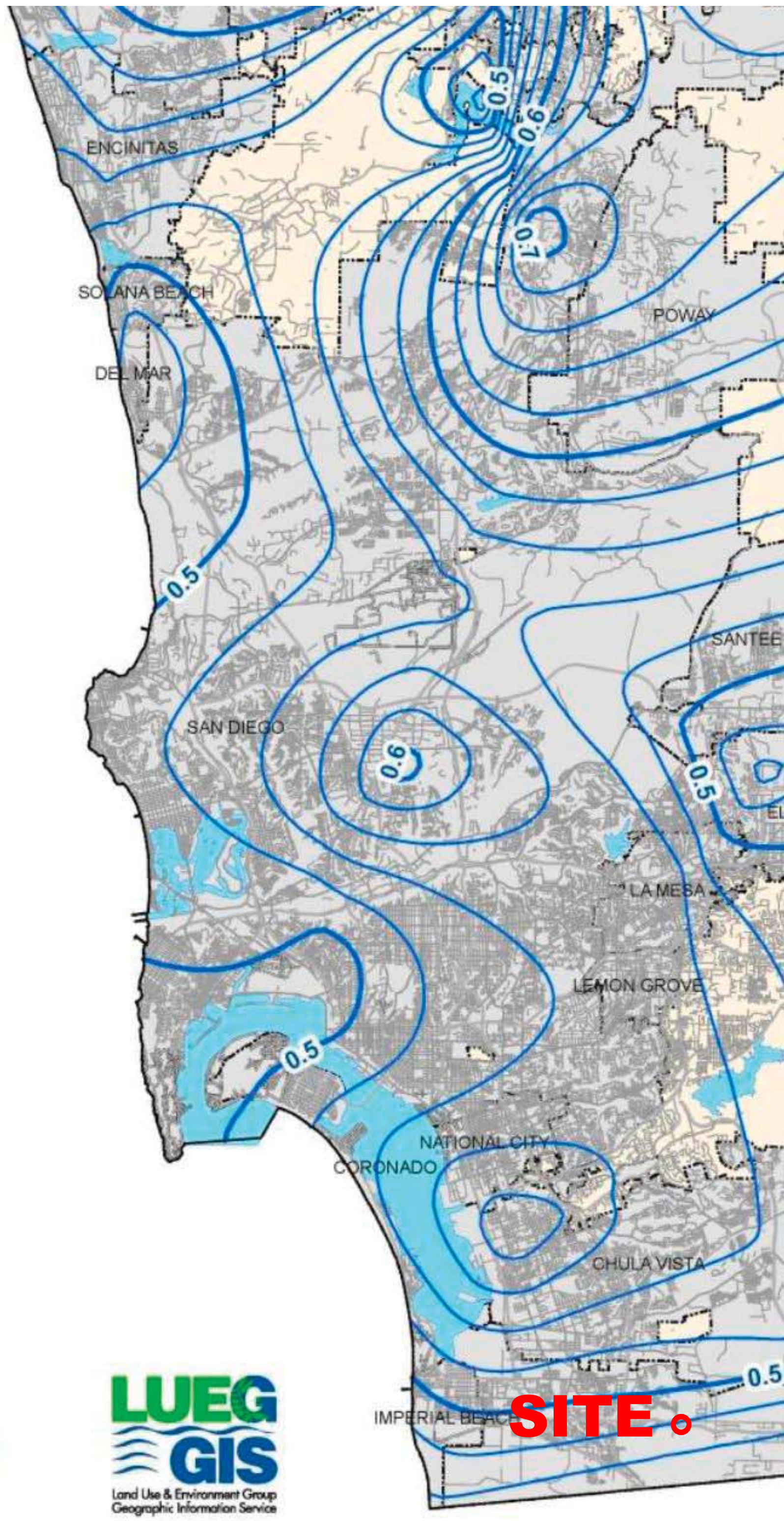
Attachment 1c

<table>
<tr><th colspan="2">Harvest and Use Feasibility Checklist</th><th>Form I-7</th></tr>
<tr><td colspan="3">1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?
☐ Toilet and urinal flushing
☐ Landscape irrigation
☐ Other:______________</td></tr>
<tr><td colspan="3">2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.
[Provide a summary of calculations here]

The overall DCV from Attachment 1b is 12,644 cubic feet or 94,583 gallons and 0.25DCV is 23,646 gallons. Items 3a to 3c below indicate that the 36 hour demand is compared to DCV to assess harvest and use feasibility. The demand from attached Table B.3-1 is 9.3 gallons per resident per day (24 hours) or 14 gallons per 36 hours. In order for the residential demand to exceed 0.25DCV, the site must have 1,689 residents (23,646/14=1,689). The project will have 171 dwelling units and 1,689/171 is 9.9. The project will not have 9.9 residents per dwelling units, so harvest and use is not feasible.</td></tr>
<tr><td colspan="3">3. Calculate the DCV using worksheet B-2.1.
DCV = 125,435 (cubic feet) See attached for DCV analysis.</td></tr>
<tr><td>3a. Is the 36 hour demand greater than or equal to the DCV?
☐ Yes / ☒ No ⇨
⇩</td><td>3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?
☐ Yes / ☒ No ⇨
⇩</td><td>3c. Is the 36 hour demand less than 0.25DCV?
☒ Yes
⇩</td></tr>
<tr><td>Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.</td><td>Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.</td><td>Harvest and use is considered to be infeasible.</td></tr>
<tr><td colspan="3">Is harvest and use feasible based on further evaluation?
☐ Yes, refer to Appendix E to select and size harvest and use BMPs.
☐ No, select alternate BMPs.</td></tr>
</table>

Furthermore, per discussions with city staff, toilet and urinal flushing harvest and use is not allowed by the plumbing code.

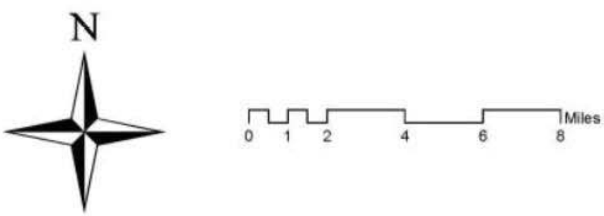
San Diego County
85 th Percentile Isopluvials



Legend

- 85th PERCENTILE ISOPLUVIAL
- INCORPORATED CITY

NOTE:
The 85th percentile is a 24 hour rainfall total. It represetns a value such that 85% of the observed 24 hour rainfall totals will be less than that value.



LUEG GIS
Land Use & Environment Group Geographic Information Service

05/14/2015
P:\Flood Control\NOAA_ATLAS_14\PCT85_REVISITED_2015\
\PCT85_DISPLAY.mxd

EXCERPT FROM FIGURE B.1-1
(24-HOUR, 85TH PERCENTILE
PRECIPITATION = 0.48")

Table B.3-1: Toilet and Urinal Water Usage per Resident or Employee

Land Use Type	Toilet User Unit of Normalization	Per Capita Use per Day		Visitor Factor[4]	Water Efficiency Factor	Total Use per Resident or Employee
		Toilet Flushing[1,2]	Urinals[3]			
Residential	Resident	18.5	NA	NA	0.5	9.3
Office	Employee (non-visitor)	9.0	2.27	1.1	0.5	7 (avg)
Retail	Employee (non-visitor)	9.0	2.11	1.4	0.5	
Schools	Employee (non-student)	6.7	3.5	6.4	0.5	33
Various Industrial Uses (excludes process water)	Employee (non-visitor)	9.0	2	1	0.5	5.5

[1]Based on American Waterworks Association Research Foundation, 1999. Residential End Uses of Water. Denver, CO: AWWARF

[2]Based on use of 3.45 gallons per flush and average number of per employee flushes per subsector, Table D-1 for MWD (Pacific Institute, 2003)

[3]Based on use of 1.6 gallons per flush, Table D-4 and average number of per employee flushes per subsector, Appendix D (Pacific Institute, 2003)

[4]Multiplied by the demand for toilet and urinal flushing for the project to account for visitors. Based on proportion of annual use allocated to visitors and others (includes students for schools; about 5 students per employee) for each subsector in Table D-1 and D-4 (Pacific Institute, 2003)

[5]Accounts for requirements to use ultra-low flush toilets in new development projects; assumed that requirements will reduce toilet and urinal flushing demand by half on average compared to literature estimates. Ultra low flush toilets are required in all new construction in California as of January 1, 1992. Ultra low flush toilets must use no more than 1.6 gallons per flush and Ultra low flush urinals must use no more than 1 gallon per flush. Note: If zero flush urinals are being used, adjust accordingly.

B.3.2.2 General Requirements for Irrigation Demand Calculations

The following guidelines should be followed for computing harvested water demand from landscape irrigation:

- If reclaimed water is planned for use for landscape irrigation, then the demand for harvested storm water should be reduced by the amount of reclaimed water that is available during the wet season.
- Irrigation rates should be based on the irrigation demand exerted by the types of landscaping that are proposed for the project, with consideration for water conservation requirements.
- Irrigation rates should be estimated to reflect the average wet season rates (defined as November through April) accounting for the effect of storm events in offsetting harvested water demand. In the absence of a detailed demand study, it should be assumed that irrigation demand is not present during days with greater than 0.1 inches of rain and the subsequent 3-day period. This irrigation shutdown period is consistent with standard practice in land application of wastewater and is applicable to storm water to prevent irrigation from resulting in dry weather runoff. Based on a statistical analysis of San Diego County rainfall patterns, approximately 30 percent of wet season days would not have a demand for irrigation.

Attachment 1d
(see Attachment 6 for Infiltration Feasibility Letter)

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]
Part 1 - Full Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		Project Phase:
Project Site		
Criteria 1: Infiltration Rate Screening		
1A	Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[11]? ☐Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing. ☐No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B). ☐No; the mapped soil types are C, D, or "urban/unclassified" and is corroborated by available site soil data. Answer "No" to Criteria 1 Result. ☑No; the mapped soil types are C, D, or "urban/unclassified" but is not corroborated by available site soil data (continue to Step 1B).	
1B	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1? ☑Yes; Continue to Step 1C. ☐No; Skip to Step 1D.	
1C	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1 greater than 0.5 inches per hour? ☐Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result. ☑No; full infiltration is not required. Answer "No" to Criteria 1 Result.	
1D	**Infiltration Testing Method.** Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation. ☐Yes; continue to Step 1E. ☐No; select an appropriate infiltration testing method.	

Note that it is not required to investigate each and every criterion in the worksheet, a single "no" answer in Part 1, Part 2, Part 3, or Part 4 determines a full, partial, or no infiltration condition.

[10] This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design.

[11] Available data includes site-specific sampling or observation of soil types or texture classes, such as obtained from borings or test pits necessary to support other design elements.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]
1E	**Number of Percolation/Infiltration Tests.** Does the infiltration testing method performed satisfy the minimum number of tests specified in Table D.3-2? ☐Yes; continue to Step 1F. ☐No; conduct appropriate number of tests.	
IF	**Factor of Safety.** Is the suitable Factor of Safety selected for full infiltration design? See guidance in D.5; Tables D.5-1 and D.5-2; and Worksheet D.5-1 (Form I-9). ☐Yes; continue to Step 1G. ☐No; select appropriate factor of safety.	
1G	**Full Infiltration Feasibility.** Is the average measured infiltration rate divided by the Factor of Safety greater than 0.5 inches per hour? ☐Yes; answer "Yes" to Criteria 1 Result. ☐No; answer "No" to Criteria 1 Result.	
Criteria 1 Result	Is the estimated reliable infiltration rate greater than 0.5 inches per hour within the DMA where runoff can reasonably be routed to a BMP? ☐Yes; the DMA may feasibly support full infiltration. Continue to Criteria 2. ☑No; full infiltration is not required. Skip to Part 1 Result.	

Summarize infiltration testing methods, testing locations, replicates, and results and summarize estimates of reliable infiltration rates according to procedures outlined in D.5. Documentation should be included in project geotechnical report.

We performed field-saturated, hydraulic conductivity tests, A-1 and A-2, using a Soil Moisture Corp Aardvark Permeameter (see Geologic Map, Figure 2). The test holes were hand excavated using 4-inch diameter hand augers. The unfactored test results of the saturated hydraulic conductivity testing for A-1 is 0.002 in/hr and 0.068 in/hr for A-2. Factored rates are 0.001 and 0.034 in/hr using a factor of 2.0.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 2: Geologic/Geotechnical Screening			
2A	If all questions in Step 2A are answered "Yes," continue to Step 2B. For any "No" answer in Step 2A answer "No" to Criteria 2, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
2A-1	Can the proposed full infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick below the infiltrating surface?	☐Yes	☐No
2A-2	Can the proposed full infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐Yes	☐No
2A-3	Can the proposed full infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐Yes	☐No
2B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1. If all questions in Step 2B are answered "Yes," then answer "Yes" to Criteria 2 Result. If there are "No" answers continue to Step 2C.		
2B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can full infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐Yes	☐No
2B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can full infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐Yes	☐No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
2B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011 or most recent edition). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can full infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐Yes	☐No
2B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can full infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐Yes	☐No
2B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can full infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐Yes	☐No
2B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can full infiltration BMPs be proposed within the DMA using established setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No

<table>
<tr><th colspan="2">Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions</th><th colspan="2">Worksheet C.4-1: Form I-8A[10]</th></tr>
<tr><td>2C</td><td> Mitigation Measures. Propose mitigation measures for each geologic/geotechnical hazard identified in Step 2B. Provide a discussion of geologic/geotechnical hazards that would prevent full infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for full infiltration BMPs? If the question in Step 2 is answered “Yes,” then answer “Yes” to Criteria 2 Result.
If the question in Step 2C is answered “No,” then answer “No” to Criteria 2 Result. </td><td>☐Yes</td><td>☐No</td></tr>
<tr><td>Criteria 2 Result</td><td>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?</td><td>☐Yes</td><td>☐No</td></tr>
<tr><td colspan="4">Summarize findings and basis; provide references to related reports or exhibits.</td></tr>
<tr><th colspan="2">Part 1 Result – Full Infiltration Geotechnical Screening [12]</th><th colspan="2">Result</th></tr>
<tr><td colspan="2"> If answers to both Criteria 1 and Criteria 2 are “Yes”, a full infiltration design is potentially feasible based on Geotechnical conditions only. If either answer to Criteria 1 or Criteria 2 is “No”, a full infiltration design is not required. </td><td colspan="2"> ☐Full infiltration Condition ☑Complete Part 2 </td></tr>
</table>

[12] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

<table>
<tr><th colspan="2">Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions</th><th>Worksheet C.4-1: Form I-8A[10]</th></tr>
<tr><td colspan="3">Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria</td></tr>
<tr><td colspan="2">DMA(s) Being Analyzed:</td><td>Project Phase:</td></tr>
<tr><td colspan="2">Project Site</td><td></td></tr>
<tr><td colspan="3">Criteria 3 : Infiltration Rate Screening</td></tr>
<tr><td>3A</td><td colspan="2">NRCS Type C, D, or “urban/unclassified”: Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or “urban/unclassified” and corroborated by available site soil data?
☐ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer “Yes” to Criteria 3 Result.
☐ Yes; the site is mapped as D soils or “urban/unclassified” and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer “Yes” to Criteria 3 Result.
☑ No; infiltration testing is conducted (refer to Table D.3-1), continue to Step 3B.</td></tr>
<tr><td>3B</td><td colspan="2">Infiltration Testing Result: Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr?
☐ Yes; the site may support partial infiltration. Answer “Yes” to Criteria 3 Result.
☑ No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer “No” to Criteria 3 Result.</td></tr>
<tr><td>Criteria 3 Result</td><td colspan="2">Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP?
☐ Yes; Continue to Criteria 4.
☑ No: Skip to Part 2 Result.</td></tr>
<tr><td colspan="3">Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate).
We performed field-saturated, hydraulic conductivity tests, A-1 and A-2, using a Soil Moisture Corp Aardvark Permeameter (see Geologic Map, Figure 2). The test holes were hand excavated using 4-inch diameter hand augers. The unfactored test results of the saturated hydraulic conductivity testing for A-1 is 0.002 in/hr and 0.068 in/hr for A-2. Factored rates are 0.001 and 0.034 in/hr using a factor of 2.0.
Test results indicate infiltration rates less than 0.05 in/hr and are not high enough to support infiltration.</td></tr>
</table>

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 4: Geologic/Geotechnical Screening			
4A	If all questions in Step 4A are answered "Yes," continue to Step 2B. For any "No" answer in Step 4A answer "No" to Criteria 4 Result, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
4A-1	Can the proposed partial infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick?	☐Yes	☐No
4A-2	Can the proposed partial infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐Yes	☐No
4A-3	Can the proposed partial infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐Yes	☐No
4B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1 If all questions in Step 4B are answered "Yes," then answer "Yes" to Criteria 4 Result. If there are any "No" answers continue to Step 4C.		
4B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can partial infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐Yes	☐No
4B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can partial infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐Yes	☐No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
4B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can partial infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐Yes	☐No
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐Yes	☐No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐Yes	☐No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	☐Yes	☐No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	☐Yes	☐No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No
Summarize findings and basis; provide references to related reports or exhibits.			

Part 2 – Partial Infiltration Geotechnical Screening Result[13]	Result
If answers to both Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site.	☐ Partial Infiltration Condition ☑ No Infiltration Condition

[13] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

ATTACHMENT 1e
POLLUTANT CONTROL BMP DESIGN

Pollutant control BMPs were selected to treat the project's pollutants of concern identified on Form I-3B. Five Bio Clean Environmental Services, Inc. Modular Wetland System Linear (see the Attachment 1A and 1B, DMA and Hydromodification Management Exhibit) were used because these have a high pollutant removal efficiency for the project's pollutants of concern. MWS-Linear are TAPE-certified and recently approved by the City of San Diego on similar multi-family residential projects. Furthermore, infiltration and partial infiltration are not feasible according to Geocon, Inc. (see Attachment 1d and 6). MWS-Linear have been selected in this entitlement-level SWQMP to demonstrate feasibility of using compact biofiltration BMPs at the site. Equivalent acceptable compact biofiltration BMPs can be selected during final engineering.

MWS Linear uses flow-based sizing. The *BMP Design Manual*, outlines the flow-based sizing procedure. The rational method is used to determine the treatment control flow rate and has the following form:

$Q_{BMP} = CIA$ where, Q_{BMP} = flow-based design flow rate, cfs
C = composite runoff factor for the drainage management areas
I = rainfall intensity = 0.2 inches per hour
A = area tributary to the BMP, acres

The impervious and pervious areas tributary to each MWS Linear are shown and tabulated in Attachment 1a and 1b.

Table 1 summarizes the rational method results for each MWS Linear and preliminary sizing. The Q_{BMP} value is multiplied by 1.5 to compute the design flow rate. The attached MWS Linear sizing table from the Bio Clean brochure shows that BMP 2 through 5 can be treated by a single unit. BMP 1 exceeds the maximum capacity of the MWS Linear units. However, communication with Bio Clean revealed that a single unit can be used if the tributary runoff first enters a vault for flow control so that the flow into the unit is reduced. This will be done for BMP 1 as well as the other BMPs, as needed, and sizing will be provided during final engineering.

MWS Linear	C	Intensity, in/hr	Area, acres	Q_{BMP}, cfs	Q_{DESIGN}[1], cfs	MWS-Linear Model
BMP 1	0.74	0.2	8.99	1.330	1.995	MWS-L-8-16[2]
BMP 2	0.81	0.2	0.22	0.036	0.053	MWS-L-4-6
BMP 3	0.80	0.2	0.22	0.035	0.052	MWS-L-4-4
BMP 4	0.79	0.2	0.16	0.026	0.038	MWS-L-4-4
BMP 5	0.78	0.2	0.16	0.025	0.037	MWS-L-4-4

[1]Q_{DESIGN} is 1.5 times Q_{BMP}. Q_{DESIGN} is used for the flow-based sizing.
[2]Sizing based on conceptual customized sizing by Bio Clean assuming vault is upstream of MWS-Linear (see attached)

Table 1. Rational Method Results

Green street criteria will be used for the Otay Mesa Road improvements (see Attachment 2d).

Flow Based Sizing

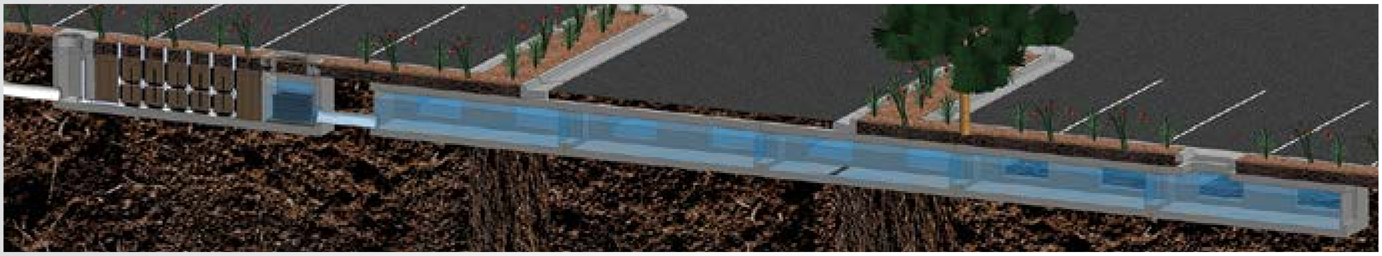
The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

Treatment Flow Sizing Table

Model #	Dimensions	WetlandMedia Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 ft^2	0.052
MWS-L-4-6	4' x 6'	32 ft^2	0.073
MWS-L-4-8	4' x 8'	50 ft^2	0.115
MWS-L-4-13	4' x 13'	63 ft^2	0.144
MWS-L-4-15	4' x 15'	76 ft^2	0.175
MWS-L-4-17	4' x 17'	90 ft^2	0.206
MWS-L-4-19	4' x 19'	103 ft^2	0.237
MWS-L-4-21	4' x 21'	117 ft^2	0.268
MWS-L-8-8	8' x 8'	100 ft^2	0.230
MWS-L-8-12	8' x 12'	151 ft^2	0.346
MWS-L-8-16	8' x 16'	201 ft^2	0.462

Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.



Treatment Volume Sizing Table

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

Bio Clean
A Forterra Company

Date: 09/12/18

To Whom It May Concern,

The MWS Linear will be sized in accordance with the TAPE GULD approval for the Modular Wetland System. The system is sized at a loading rate of (less than or equal to) 1.0 gpm/ sq ft, where the pre-filter cartridges are sized at a loading rate of less than 2.1 gpm/ sq ft. Design, sizing, and loading have been reviewed and approved by a Modular Wetland Representative and is ready for final approval. Shown below are the calculations for this Project:

<u>MWS-L-8-16-V:</u>

- Biofiltration Wetland Media Surface Area = 59.2 sq ft
- Operating HGL = 2.8 ft
- Biofiltration Wetland Media Loading Rate = 26 in/hr (0.26 gpm/sq ft)
- Drain Down Time = 36 hrs
- Average Discharge Rate = 43.10 gpm
- Water Quality Volume Treated = 12,449 cu ft

If you have any questions please feel free to contact us at your convenience.

Sincerely,

Anthony J. Spolar, E.I.T.

Stormwater Engineer

Modular Wetland System, Inc.

398 Via El Centro, Oceanside, CA 92058
(469) 458-7973 • Fax (760) 433-3176
www.biocleanenvironmental.com

$\underline{\boldsymbol{VOLUME - BASED\ SIZING}}$

$Given$: $\underbrace{Q = vA \,\&\, V = Qt}$

$Rewritting, V = vAt$

$$A_{SURFACE} = \frac{V}{vt}$$

MWS-L-8-16-V:

$Given$: $V = 12{,}449\ ft^3, v = 26\frac{in}{hr}, t = 36\ hr, Media\ perimeter = 59.2\ ft^2$

$\underline{Convert\ 26\ in/hr\ to\ gpm}$:

$$v = 26\ in/hr \left[\frac{448.8}{(12)(60)(60)}\right] = 0.26\ gpm$$

$\underline{Solve\ for\ the\ required\ media\ surface\ area}$:

$$A_{SURFACE} = \frac{12449}{0.26(36)}\left[\frac{448.8}{(60)(60)}\right]\ hr = 165.80\ ft^2$$

$$A_{SURFACE} = (perimeter\ )(height) \Rightarrow h = \frac{A_{SURFACE}}{P}$$

$$h = \frac{165.80}{59.2} = 2.8\ ft$$

$The\ HGL\ within\ the\ MWS\ unit\ needs\ to\ be\ 2.8\ ft\ in\ order\ to\ treat$ $12449\ ft^3 over\ a\ 36\ hour\ period.$

MWS ORIFICE SIZING

$$Given\ that: Q = VA;\ \ Q = treatment\ flow\ rate, V = \ c_d\sqrt{2gh}\ , A = \ \frac{\pi D^2}{4}$$

$$c_d\ is\ the\ discharge\ coefficent\ \&\ h\ is\ the\ treatment\ HGL$$

$$Rewrite\ to\ solve\ for\ the\ diameter\ of\ the\ orifice.$$

$$\left[A = \frac{Q}{V}\right] \xrightarrow[rewrite]{} \frac{\pi D^2}{4} = \frac{Q}{c_d\sqrt{2gh}}$$

$$D = \sqrt{\frac{4Q}{\pi c_d\sqrt{2gh}}};\ c_d = \ c_v c_c = 0.98 * 0.62 = 0.6076$$

<u>MWS-L-8-16-V:</u>

$Given: V = 12449\ ft^3\ , t = 36\ hr$

$$Q = \left[\frac{12449}{(36)(60)(60)}\right] = 0.096\ cfs$$

$$D = \sqrt{\frac{4(0.096)}{\pi(0.6076)\sqrt{2(32.12)(2.8)}}} = 0.122' = \boxed{1.47"}$$

The diameter of the orifices needs to be 1.47" *in order to produce a head of* 2.8′ *in the MWS unit.*

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Compact (high rate) biofiltration BMPs have a media filtration rate greater than 5 in/hr. and a media surface area smaller than 3% of contributing area times adjusted runoff factor. Compact biofiltration BMPs are typically proprietary BMPs that may qualify as biofiltration.

A compact biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in some cases. This depends on the characteristics of the DMA **and** the performance certification/data of the BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite storm water alternative compliance program to meet its pollutant control obligations.

An applicant using a compact biofiltration BMP to meet the pollutant control requirements onsite must complete Section 1 of this form and include it in the PDP SWQMP. A separate form must be completed for each DMA. In instances where the City Engineer does not agree with the applicant's determination, Section 2 of this form will be completed by the City and returned to the applicant.

Section 1: Biofiltration Criteria Checklist (Appendix F)

Refer to Part 1 of the Storm Water Standards to complete this section. When separate forms/worksheets are referenced below, the applicant must also complete these separate forms/worksheets (as applicable) and include in the PDP SWQMP. The criteria numbers below correspond to the criteria numbers in Appendix F.

Criteria	Answer	Progression
Criteria 1 and 3: What is the infiltration condition of the DMA? Refer to Section 5.4.2 and Appendix C of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. Applicant must complete and include the following in the PDP SWQMP submittal to support the feasibility determination: • Infiltration Feasibility Condition Letter; or • Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B. Applicant must complete and include all applicable sizing worksheets in the SWQMP submittal	○ Full Infiltration Condition	**Stop**. Compact biofiltration BMP is not allowed.
	○ Partial Infiltration Condition	Compact biofiltration BMP is only allowed, if the target volume retention is met onsite (Refer to Table B.5-1 in Appendix B.5). Use Worksheet B.5-2 in Appendix B.5 to estimate the target volume retention (Note: retention in this context means reduction). If the required volume reduction is achieved **proceed to Criteria 2**. If the required volume reduction is not achieved, compact biofiltration BMP is not allowed. **Stop**.
	⦿ No Infiltration Condition	Compact biofiltration BMP is allowed if volume retention criteria in Table B.5-1 in Appendix B.5 for the no infiltration condition is met. Compliance with this criterion must be documented in the PDP SWQMP. If the criteria in Table B.5-1 is met **proceed to Criteria 2**. Attached after this form. If the criteria in Table B.5-1 is not met, compact biofiltration BMP is not allowed. **Stop**.

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 1 and 3:

Feasibility Analysis:

Summarize findings and include either infiltration feasibility condition letter or Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B in the PDP SWQMP submittal.

If Partial Infiltration Condition:

Provide documentation that target volume retention is met (include Worksheet B.5-2 in the PDP SWQMP submittal). Worksheet B.5-7 in Appendix B.5 can be used to estimate volume retention benefits from landscape areas.

If No Infiltration Condition:

Provide documentation that the volume retention performance standard is met (include Worksheet B.5-2 in the PDP SWQMP submittal) in the PDP SWQMP submittal. Worksheet B.5-6 in Appendix B.5 can be used to document that the performance standard is met.

Criteria	Answer	Progression
Criteria 2: Is the compact biofiltration BMP sized to meet the performance standard from the MS4 Permit? Refer to Appendix B.5 and Appendix F.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Meets Flow based Criteria	Use guidance from **Appendix F.2.2** to size the compact biofiltration BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP. Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft. cannot be designed using a loading rate of 1.5 gpm/sq. ft.) **Proceed to Criteria 4.**
	○ Meets Volume based Criteria	Provide documentation that the compact biofiltration BMP has a total static (i.e. non-routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite. **Proceed to Criteria 4.**
	○ Does not Meet either criteria	**Stop**. Compact biofiltration BMP is not allowed.

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 2:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable).

Flow-based sizing calculations are provided at the beginning of Attachment 1e.

Criteria	Answer	Progression
Criteria 4: Does the compact biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern? Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes, meets the TAPE certification.	Provide documentation that the compact BMP has an appropriate TAPE certification for the projects most significant pollutants of concern. **Proceed to Criteria 5.**
	○ Yes, through other third-party documentation	Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a compact biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2. **Proceed to Criteria 5.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 4:

Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the compact biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern.

TAPE certification is attached after this form.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
<u>Criteria 5</u>: Is the compact biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process? Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes	Provide documentation that the compact biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance. **Proceed to Criteria 6.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 5:

Provide documentation that appropriate biological activity is supported by the compact biofiltration BMP to maintain treatment process.

MWS Linear brochure is attached after this form and show biofiltration.

Criteria	Answer	Progression
<u>Criteria 6</u>: Is the compact biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP?	◉ Yes	Provide documentation that the compact biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification. **Proceed to Criteria 7.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 6:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).

Flow-based sizing calculations are provided at the beginning of Attachment 1e. The units are designed to withstand erosion, scour, and channeling if sized for the design flow rate. The units are concrete, which will withstand hydraulic forces.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 7: Is the compact biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)?	◉ Yes, and the compact BMP is privately owned, operated and not in the public right of way.	Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. **Stop**. The compact biofiltration BMP meets the required criteria.
	◉ Yes, and the BMP is either owned or operated by the City or in the public right of way.	Approval is at the discretion of the City Engineer. The city engineer will consider maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business or other relevant factors while making the determination. **Stop**. Consult the City Engineer for a determination.
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 7:

Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. PDP SWQMP must include a statement that the compact BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.

The maintenance agreement will be provided in the final engineering SWMQP.
The MWS Linear BMPs in Street A and B will be public. The other will be private.

Compact (high rate) Biofiltration BMP Checklist	Form I-10
Section 2: Verification (For City Use Only)	
Is the proposed compact BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA?	◉ Yes ○ No, See explanation below
Explanation/reason if the compact BMP is not accepted by the City for onsite pollutant control compliance:	

Table B-5.1

Infiltration Feasibility Condition	Performance Standard
No Infiltration Condition (Based on Infiltration Feasibility Condition Letter and/or Worksheet C.4-1: Form I-8A and/or Worksheet C.4-2: Form I-8B) [There is no hierarchy in selecting the type of biofiltration BMP as long as the performance standard for the selected biofiltration BMP is met]	**Standard Biofiltration BMPs:** BMPs must meet the criteria in Appendix B.5.1.2
	Non-Standard Biofiltration BMPs: Pollutant Removal: BMP must be sized using Worksheet B.5-1 and Worksheet B.5-4; **AND** Volume Retention: DMA must meet the target volume retention calculated using Worksheet B.5-2 (based on Figure B.5-2). Compliance with volume retention requirements can be documented by: • DMA has a combined BMP footprint and landscaped area (that meet the criteria in SD-B and SD-F factsheet) of 3% of contributing area times adjusted runoff factor or greater. The landscaped area must have an impervious area to pervious area ratio greater than 1.5:1. This can be documented using Worksheet B.5-6. [OR] • Applicant has an option to use other site design BMPs that will meet the target volume retention calculated using Worksheet B.5-2. This can be documented using Worksheet B.5-6 and/or Worksheet B.5-7.
	Compact Biofiltration BMPs: Pollutant Removal: BMP must meet the criteria in Appendix F. Form I-10 must be completed and submitted with the PDP SWQMP; **AND** Volume Retention: DMA must meet the target volume retention calculated using Worksheet B.5-2 (based on Figure B.5-2). Compliance with volume retention requirements can be documented by: • DMA has a combined BMP footprint and landscaped area (that meet the criteria in SD-B and SD-F factsheet) of 3% of contributing area times adjusted runoff factor or greater. The landscaped area must have an impervious area to pervious area ratio greater than 1.5:1. This can be documented using Worksheet B.5-6. [OR] • Applicant has an option to use other site design BMPs that will meet the target volume retention calculated using Worksheet B.5-2. This can be documented using Worksheet B.5-6 and/or Worksheet B.5-7.

Worksheet B.5-2 and B.5-6 are attached.

The City of SAN DIEGO	Project Name	PA-61	
	BMP ID	BMP 1	
Sizing Method for Volume Retention Criteria		**Worksheet B.5-2**	
1	Area draining to the BMP	391,771	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.74	
3	85^{th} percentile 24-hour rainfall depth	0.48	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	11596	cu. ft.
Volume Retention Requirement			
5	Measured infiltration rate in the DMA Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05	0	in/hr.
6	Factor of safety	2	
7	Reliable infiltration rate, for biofiltration BMP sizing [Line 5 / Line 6]	0	in/hr.
8	Average annual volume reduction target (Figure B.5-2) When Line 7 > 0.01 in/hr. = Minimum (40, 166.9 x Line 7 +6.62) When Line 7 ≤ 0.01 in/hr. = 3.5%	3.5	%
9	Fraction of DCV to be retained (Figure B.5-3) When Line 8 > 8% = $0.0000013 \times \text{Line } 8^3 - 0.000057 \times \text{Line } 8^2 + 0.0086 \times \text{Line } 8 - 0.014$ When Line 8 ≤ 8% = 0.023	0.023	
10	Target volume retention [Line 9 x Line 4]	267	cu. ft.

The City of SAN DIEGO

		Project Name	PA-61				
		BMP ID	BMP 1				
Volume Retention for No Infiltration Condition				**Worksheet B.5-6**			
1	Area draining to the biofiltration BMP					391,771	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)					0.74	
3	Effective impervious area draining to the BMP [Line 1 x Line 2]					289911	sq. ft.
4	Required area for Evapotranspiration [Line 3 x 0.03]					8697	sq. ft.
5	Biofiltration BMP Footprint					0	sq. ft.
Landscape Area (must be identified on DS-3247)							
		Identification	**1**	**2**	**3**	**4**	**5**
6	Landscape area that meet the requirements in SD-B and SD-F Fact Sheet (sq. ft.)		9501				
7	Impervious area draining to the landscape area (sq. ft.)		14251				
8	Impervious to Pervious Area ratio [Line 7/Line 6]		1.50	0.00	0.00	0.00	0.00
9	Effective Credit Area If (Line 8 >1.5, Line 6, Line 7/1.5]		9501	0	0	0	0
10	Sum of Landscape area [sum of Line 9 Id's 1 to 5]				9501		sq. ft.
11	Provided footprint for evapotranspiration [Line 5 + Line 10]				9501		sq. ft.
Volume Retention Performance Standard							
12	Is Line 11 ≥ Line 4?		Volume Retention Performance Standard is Met				
13	Fraction of the performance standard met through the BMP footprint and/or landscaping [Line 11/Line 4]				1.09		
14	Target Volume Retention [Line 10 from Worksheet B.5.2]				267		cu. ft.
15	Volume retention required from other site design BMPs [(1-Line 13) x Line 14]				-24.03		cu. ft.
Site Design BMP							
	Identification	**Site Design Type**			**Credit**		
16	**1**						cu. ft.
	2						cu. ft.
	3						cu. ft.
	4						cu. ft.
	5						cu. ft.
	Sum of volume retention benefits from other site design BMPs (e.g. trees; rain barrels etc.). [sum of Line 16 Credits for Id's 1 to 5] Provide documentation of how the site design credit is calculated in the PDP SWQMP.				0		cu. ft.
17	Is Line 16 ≥ Line 15?		Volume Retention Performance Standard is Met				

The City of SAN DIEGO	Project Name	PA-61	
	BMP ID	BMP 2	
Sizing Method for Volume Retention Criteria		**Worksheet B.5-2**	
1	Area draining to the BMP	9,520	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.81	
3	85^{th} percentile 24-hour rainfall depth	0.48	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	308	cu. ft.
Volume Retention Requirement			
5	Measured infiltration rate in the DMA Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05	0	in/hr.
6	Factor of safety	2	
7	Reliable infiltration rate, for biofiltration BMP sizing [Line 5 / Line 6]	0	in/hr.
8	Average annual volume reduction target (Figure B.5-2) When Line 7 > 0.01 in/hr. = Minimum (40, 166.9 x Line 7 +6.62) When Line 7 ≤ 0.01 in/hr. = 3.5%	3.5	%
9	Fraction of DCV to be retained (Figure B.5-3) When Line 8 > 8% = 0.0000013 x Line 8^3 - 0.000057 x Line 8^2 + 0.0086 x Line 8 - 0.014 When Line 8 ≤ 8% = 0.023	0.023	
10	Target volume retention [Line 9 x Line 4]	7	cu. ft.

The City of SAN DIEGO	Project Name	PA-61			
	BMP ID	BMP 2			

Volume Retention for No Infiltration Condition				Worksheet B.5-6		
1	Area draining to the biofiltration BMP				9,520	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)				0.81	
3	Effective impervious area draining to the BMP [Line 1 x Line 2]				7711	sq. ft.
4	Required area for Evapotranspiration [Line 3 x 0.03]				231	sq. ft.
5	Biofiltration BMP Footprint				0	sq. ft.

Landscape Area (must be identified on DS-3247)

	Identification	1	2	3	4	5
6	Landscape area that meet the requirements in SD-B and SD-F Fact Sheet (sq. ft.)	233				
7	Impervious area draining to the landscape area (sq. ft.)	350				
8	Impervious to Pervious Area ratio [Line 7/Line 6]	1.50	0.00	0.00	0.00	0.00
9	Effective Credit Area If (Line 8 >1.5, Line 6, Line 7/1.5]	233	0	0	0	0
10	Sum of Landscape area [sum of Line 9 Id's 1 to 5]			233		sq. ft.
11	Provided footprint for evapotranspiration [Line 5 + Line 10]			233		sq. ft.

Volume Retention Performance Standard

12	Is Line 11 ≥ Line 4?	Volume Retention Performance Standard is Met	
13	Fraction of the performance standard met through the BMP footprint and/or landscaping [Line 11/Line 4]	1.01	
14	Target Volume Retention [Line 10 from Worksheet B.5.2]	7	cu. ft.
15	Volume retention required from other site design BMPs [(1-Line 13) x Line 14]	-0.07	cu. ft.

Site Design BMP

	Identification	Site Design Type	Credit	
16	1			cu. ft.
	2			cu. ft.
	3			cu. ft.
	4			cu. ft.
	5			cu. ft.
	Sum of volume retention benefits from other site design BMPs (e.g. trees; rain barrels etc.). [sum of Line 16 Credits for Id's 1 to 5] Provide documentation of how the site design credit is calculated in the PDP SWQMP.		0	cu. ft.
17	Is Line 16 ≥ Line 15?	Volume Retention Performance Standard is Met		

The City of SAN DIEGO	Project Name	PA-61	
	BMP ID	BMP 3	
Sizing Method for Volume Retention Criteria		**Worksheet B.5-2**	

1	Area draining to the BMP	9,514	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.8	
3	85^{th} percentile 24-hour rainfall depth	0.48	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	304	cu. ft.
Volume Retention Requirement			
5	Measured infiltration rate in the DMA Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05	0	in/hr.
6	Factor of safety	2	
7	Reliable infiltration rate, for biofiltration BMP sizing [Line 5 / Line 6]	0	in/hr.
8	Average annual volume reduction target (Figure B.5-2) When Line 7 > 0.01 in/hr. = Minimum (40, 166.9 x Line 7 +6.62) When Line 7 ≤ 0.01 in/hr. = 3.5%	3.5	%
9	Fraction of DCV to be retained (Figure B.5-3) When Line 8 > 8% = 0.0000013 x Line 8^3 - 0.000057 x Line 8^2 + 0.0086 x Line 8 - 0.014 When Line 8 ≤ 8% = 0.023	0.023	
10	Target volume retention [Line 9 x Line 4]	7	cu. ft.

The City of SAN DIEGO

		Project Name	PA-61			
		BMP ID	BMP 3			
Volume Retention for No Infiltration Condition					**Worksheet B.5-6**	
1	Area draining to the biofiltration BMP				9,514	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)				0.8	
3	Effective impervious area draining to the BMP [Line 1 x Line 2]				7611	sq. ft.
4	Required area for Evapotranspiration [Line 3 x 0.03]				228	sq. ft.
5	Biofiltration BMP Footprint				0	sq. ft.
Landscape Area (must be identified on DS-3247)						
		Identification	**1**	**2**	**3**	**4**	**5**
6	Landscape area that meet the requirements in SD-B and SD-F Fact Sheet (sq. ft.)		233				
7	Impervious area draining to the landscape area (sq. ft.)		350				
8	Impervious to Pervious Area ratio [Line 7/Line 6]		1.50	0.00	0.00	0.00	0.00
9	Effective Credit Area If (Line 8 >1.5, Line 6, Line 7/1.5]		233	0	0	0	0
10	Sum of Landscape area [sum of Line 9 Id's 1 to 5]				233		sq. ft.
11	Provided footprint for evapotranspiration [Line 5 + Line 10]				233		sq. ft.
Volume Retention Performance Standard							
12	Is Line 11 ≥ Line 4?		Volume Retention Performance Standard is Met				
13	Fraction of the performance standard met through the BMP footprint and/or landscaping [Line 11/Line 4]				1.02		
14	Target Volume Retention [Line 10 from Worksheet B.5.2]				7		cu. ft.
15	Volume retention required from other site design BMPs [(1-Line 13) x Line 14]				-0.14		cu. ft.
Site Design BMP							
	Identification	**Site Design Type**			**Credit**		
16	**1**						cu. ft.
	2						cu. ft.
	3						cu. ft.
	4						cu. ft.
	5						cu. ft.
	Sum of volume retention benefits from other site design BMPs (e.g. trees; rain barrels etc.). [sum of Line 16 Credits for Id's 1 to 5] Provide documentation of how the site design credit is calculated in the PDP SWQMP.				0		cu. ft.
17	Is Line 16 ≥ Line 15?		Volume Retention Performance Standard is Met				

The City of SAN DIEGO	Project Name	PA-61	
	BMP ID	BMP 4	
Sizing Method for Volume Retention Criteria		**Worksheet B.5-2**	
1	Area draining to the BMP	7,035	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.79	
3	85th percentile 24-hour rainfall depth	0.48	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	222	cu. ft.
Volume Retention Requirement			
5	Measured infiltration rate in the DMA Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05	0	in/hr.
6	Factor of safety	2	
7	Reliable infiltration rate, for biofiltration BMP sizing [Line 5 / Line 6]	0	in/hr.
8	Average annual volume reduction target (Figure B.5-2) When Line 7 > 0.01 in/hr. = Minimum (40, 166.9 x Line 7 +6.62) When Line 7 ≤ 0.01 in/hr. = 3.5%	3.5	%
9	Fraction of DCV to be retained (Figure B.5-3) When Line 8 > 8% = 0.0000013 x Line 8^3 - 0.000057 x Line 8^2 + 0.0086 x Line 8 - 0.014 When Line 8 ≤ 8% = 0.023	0.023	
10	Target volume retention [Line 9 x Line 4]	5	cu. ft.

The City of SAN DIEGO		Project Name	PA-61				
		BMP ID	BMP 4				
Volume Retention for No Infiltration Condition				**Worksheet B.5-6**			
1	Area draining to the biofiltration BMP					7,035	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)					0.79	
3	Effective impervious area draining to the BMP [Line 1 x Line 2]					5558	sq. ft.
4	Required area for Evapotranspiration [Line 3 x 0.03]					167	sq. ft.
5	Biofiltration BMP Footprint					0	sq. ft.
Landscape Area (must be identified on DS-3247)							
		Identification	**1**	**2**	**3**	**4**	**5**
6	Landscape area that meet the requirements in SD-B and SD-F Fact Sheet (sq. ft.)		167				
7	Impervious area draining to the landscape area (sq. ft.)		250				
8	Impervious to Pervious Area ratio [Line 7/Line 6]		1.50	0.00	0.00	0.00	0.00
9	Effective Credit Area If (Line 8 >1.5, Line 6, Line 7/1.5]		167	0	0	0	0
10	Sum of Landscape area [sum of Line 9 Id's 1 to 5]					167	sq. ft.
11	Provided footprint for evapotranspiration [Line 5 + Line 10]					167	sq. ft.
Volume Retention Performance Standard							
12	Is Line 11 ≥ Line 4?		Volume Retention Performance Standard is Met				
13	Fraction of the performance standard met through the BMP footprint and/or landscaping [Line 11/Line 4]					1	
14	Target Volume Retention [Line 10 from Worksheet B.5.2]					5	cu. ft.
15	Volume retention required from other site design BMPs [(1-Line 13) x Line 14]					0	cu. ft.
Site Design BMP							
	Identification	**Site Design Type**				**Credit**	
16	**1**						cu. ft.
	2						cu. ft.
	3						cu. ft.
	4						cu. ft.
	5						cu. ft.
	Sum of volume retention benefits from other site design BMPs (e.g. trees; rain barrels etc.). [sum of Line 16 Credits for Id's 1 to 5] Provide documentation of how the site design credit is calculated in the PDP SWQMP.					0	cu. ft.
17	Is Line 16 ≥ Line 15?		Volume Retention Performance Standard is Met				

The City of SAN DIEGO

Project Name		PA-61	
BMP ID		BMP 5	
Sizing Method for Volume Retention Criteria		**Worksheet B.5-2**	
1	Area draining to the BMP	6,968	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.78	
3	85^{th} percentile 24-hour rainfall depth	0.48	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	217	cu. ft.
Volume Retention Requirement			
5	Measured infiltration rate in the DMA Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05	0	in/hr.
6	Factor of safety	2	
7	Reliable infiltration rate, for biofiltration BMP sizing [Line 5 / Line 6]	0	in/hr.
8	Average annual volume reduction target (Figure B.5-2) When Line 7 > 0.01 in/hr. = Minimum (40, 166.9 x Line 7 +6.62) When Line 7 ≤ 0.01 in/hr. = 3.5%	3.5	%
9	Fraction of DCV to be retained (Figure B.5-3) When Line 8 > 8% = 0.0000013 x Line 8^3 - 0.000057 x Line 8^2 + 0.0086 x Line 8 - 0.014 When Line 8 ≤ 8% = 0.023	0.023	
10	Target volume retention [Line 9 x Line 4]	5	cu. ft.

The City of SAN DIEGO

Project Name	PA-61
BMP ID	BMP 5

Volume Retention for No Infiltration Condition							**Worksheet B.5-6**
1	Area draining to the biofiltration BMP					6,968	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)					0.78	
3	Effective impervious area draining to the BMP [Line 1 x Line 2]					5435	sq. ft.
4	Required area for Evapotranspiration [Line 3 x 0.03]					163	sq. ft.
5	Biofiltration BMP Footprint					0	sq. ft.
Landscape Area (must be identified on DS-3247)							
	Identification	**1**	**2**	**3**	**4**		**5**
6	Landscape area that meet the requirements in SD-B and SD-F Fact Sheet (sq. ft.)	167					
7	Impervious area draining to the landscape area (sq. ft.)	250					
8	Impervious to Pervious Area ratio [Line 7/Line 6]	1.50	0.00	0.00	0.00		0.00
9	Effective Credit Area If (Line 8 >1.5, Line 6, Line 7/1.5]	167	0	0	0		0
10	Sum of Landscape area [sum of Line 9 Id's 1 to 5]					167	sq. ft.
11	Provided footprint for evapotranspiration [Line 5 + Line 10]					167	sq. ft.
Volume Retention Performance Standard							
12	Is Line 11 ≥ Line 4?	Volume Retention Performance Standard is Met					
13	Fraction of the performance standard met through the BMP footprint and/or landscaping [Line 11/Line 4]					1.02	
14	Target Volume Retention [Line 10 from Worksheet B.5.2]					5	cu. ft.
15	Volume retention required from other site design BMPs [(1-Line 13) x Line 14]					-0.1	cu. ft.

Site Design BMP				
	Identification	**Site Design Type**	**Credit**	
16	**1**			cu. ft.
	2			cu. ft.
	3			cu. ft.
	4			cu. ft.
	5			cu. ft.
	Sum of volume retention benefits from other site design BMPs (e.g. trees; rain barrels etc.). [sum of Line 16 Credits for Id's 1 to 5] Provide documentation of how the site design credit is calculated in the PDP SWQMP.		0	cu. ft.
17	Is Line 16 ≥ Line 15?	Volume Retention Performance Standard is Met		

TAPE Certification

April 2014

GENERAL USE LEVEL DESIGNATION FOR BASIC, ENHANCED, AND PHOSPHORUS TREATMENT

For the

MWS-Linear Modular Wetland

Ecology's Decision:

Based on Modular Wetland Systems, Inc. application submissions, including the Technical Evaluation Report, dated April 1, 2014, Ecology hereby issues the following use level designation:

1. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Basic treatment
   - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.
2. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Phosphorus treatment
   - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.
3. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Enhanced treatment
   - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

4. Ecology approves the MWS - Linear Modular Wetland Stormwater Treatment System units for Basic, Phosphorus, and Enhanced treatment at the hydraulic loading rate listed above. Designers shall calculate the water quality design flow rates using the following procedures:

   - Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.
   - Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
   - Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.

5. These use level designations have no expiration date but may be revoked or amended by Ecology, and are subject to the conditions specified below.

Ecology's Conditions of Use:

Applicants shall comply with the following conditions:

1. Design, assemble, install, operate, and maintain the MWS – Linear Modular Wetland Stormwater Treatment System units, in accordance with Modular Wetland Systems, Inc. applicable manuals and documents and the Ecology Decision.
2. Each site plan must undergo Modular Wetland Systems, Inc. review and approval before site installation. This ensures that site grading and slope are appropriate for use of a MWS – Linear Modular Wetland Stormwater Treatment System unit.
3. MWS – Linear Modular Wetland Stormwater Treatment System media shall conform to the specifications submitted to, and approved by, Ecology.
4. Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of manufactured filter treatment device.

   - Typically, Modular Wetland Systems, Inc. designs MWS - Linear Modular Wetland systems for a target prefilter media life of 6 to 12 months.
   - Indications of the need for maintenance include effluent flow decreasing to below the design flow rate or decrease in treatment below required levels.
   - Owners/operators must inspect MWS - Linear Modular Wetland systems for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the

first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.

- Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.
- When inspections are performed, the following findings typically serve as maintenance triggers:
    - Standing water remains in the vault between rain events, or
    - Bypass occurs during storms smaller than the design storm.
    - If excessive floatables (trash and debris) are present (but no standing water or excessive sedimentation), perform a minor maintenance consisting of gross solids removal, not prefilter media replacement.
    - Additional data collection will be used to create a correlation between pretreatment chamber sediment depth and pre-filter clogging (see *Issues to be Addressed by the Company* section below)

6. Discharges from the MWS - Linear Modular Wetland Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

Applicant:	Modular Wetland Systems, Inc.
Applicant's Address:	*PO. Box 869*
	Oceanside, CA 92054

Application Documents:

- *Original Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., January 2011
- *Quality Assurance Project Plan*: Modular Wetland system – Linear Treatment System performance Monitoring Project, draft, January 2011.
- *Revised Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., May 2011
- *Memorandum: Modular Wetland System-Linear GULD Application Supplementary Data, April 2014*
- *Technical Evaluation Report: Modular Wetland System Stormwater Treatment System Performance Monitoring, April 2014.*

Applicant's Use Level Request:

General use level designation as a Basic, Enhanced, and Phosphorus treatment device in accordance with Ecology's Guidance for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE) January 2011 Revision.

Applicant's Performance Claims:

- The MWS – Linear Modular wetland is capable of removing a minimum of 80-percent of TSS from stormwater with influent concentrations between 100 and 200 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 50-percent of Total Phosphorus from stormwater with influent concentrations between 0.1 and 0.5 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 30-percent of dissolved Copper from stormwater with influent concentrations between 0.005 and 0.020 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 60-percent of dissolved Zinc from stormwater with influent concentrations between 0.02 and 0.30 mg/l.

Ecology Recommendations:

- Modular Wetland Systems, Inc. has shown Ecology, through laboratory and field-testing, that the MWS - Linear Modular Wetland Stormwater Treatment System filter system is capable of attaining Ecology's Basic, Total phosphorus, and Enhanced treatment goals.

Findings of Fact:

<u>Laboratory Testing</u>

The MWS-Linear Modular wetland has the:

- Capability to remove 99 percent of total suspended solids (using Sil-Co-Sil 106) in a quarter-scale model with influent concentrations of 270 mg/L.
- Capability to remove 91 percent of total suspended solids (using Sil-Co-Sil 106) in laboratory conditions with influent concentrations of 84.6 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 93 percent of dissolved Copper in a quarter-scale model with influent concentrations of 0.757 mg/L.
- Capability to remove 79 percent of dissolved Copper in laboratory conditions with influent concentrations of 0.567 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 80.5-percent of dissolved Zinc in a quarter-scale model with influent concentrations of 0.95 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 78-percent of dissolved Zinc in laboratory conditions with influent concentrations of 0.75 mg/L at a flow rate of 3.0 gpm per square foot of media.

<u>Field Testing</u>

- Modular Wetland Systems, Inc. conducted monitoring of an MWS-Linear (Model # MWS-L-4-13) from April 2012 through May 2013, at a transportation maintenance facility in Portland, Oregon. The manufacturer collected flow-weighted composite samples of the system's influent and effluent during 28 separate storm events. The system treated approximately 75 percent of the runoff from 53.5 inches of rainfall during the monitoring period. The applicant sized the system at 1 gpm/sq ft. (wetland media) and 3gpm/sq ft. (prefilter).

- Influent TSS concentrations for qualifying sampled storm events ranged from 20 to 339 mg/L. Average TSS removal for influent concentrations greater than 100 mg/L (n=7) averaged 85 percent. For influent concentrations in the range of 20-100 mg/L (n=18), the upper 95 percent confidence interval about the mean effluent concentration was 12.8 mg/L.
- Total phosphorus removal for 17 events with influent TP concentrations in the range of 0.1 to 0.5 mg/L averaged 65 percent. A bootstrap estimate of the lower 95 percent confidence limit (LCL95) of the mean total phosphorus reduction was 58 percent.
- The lower 95 percent confidence limit of the mean percent removal was 60.5 percent for dissolved zinc for influent concentrations in the range of 0.02 to 0.3 mg/L (n=11). The lower 95 percent confidence limit of the mean percent removal was 32.5 percent for dissolved copper for influent concentrations in the range of 0.005 to 0.02 mg/L (n=14) at flow rates up to 28 gpm (design flow rate 41 gpm). Laboratory test data augmented the data set, showing dissolved copper removal at the design flow rate of 41 gpm (93 percent reduction in influent dissolved copper of 0.757 mg/L).

Issues to be addressed by the Company:

1. Modular Wetland Systems, Inc. should collect maintenance and inspection data for the first year on all installations in the Northwest in order to assess standard maintenance requirements for various land uses in the region. Modular Wetland Systems, Inc. should use these data to establish required maintenance cycles.
2. Modular Wetland Systems, Inc. should collect pre-treatment chamber sediment depth data for the first year of operation for all installations in the Northwest. Modular Wetland Systems, Inc. will use these data to create a correlation between sediment depth and pre-filter clogging.

Technology Description:
Download at http://www.modularwetlands.com/

Contact Information:
Applicant: Greg Kent
Modular Wetland Systems, Inc.
P.O. Box 869
Oceanside, CA 92054
gkent@biocleanenvironmental.net

Applicant website: http://www.modularwetlands.com/

Ecology web link: http://www.ecy.wa.gov/programs/wg/stormwater/newtech/index.html

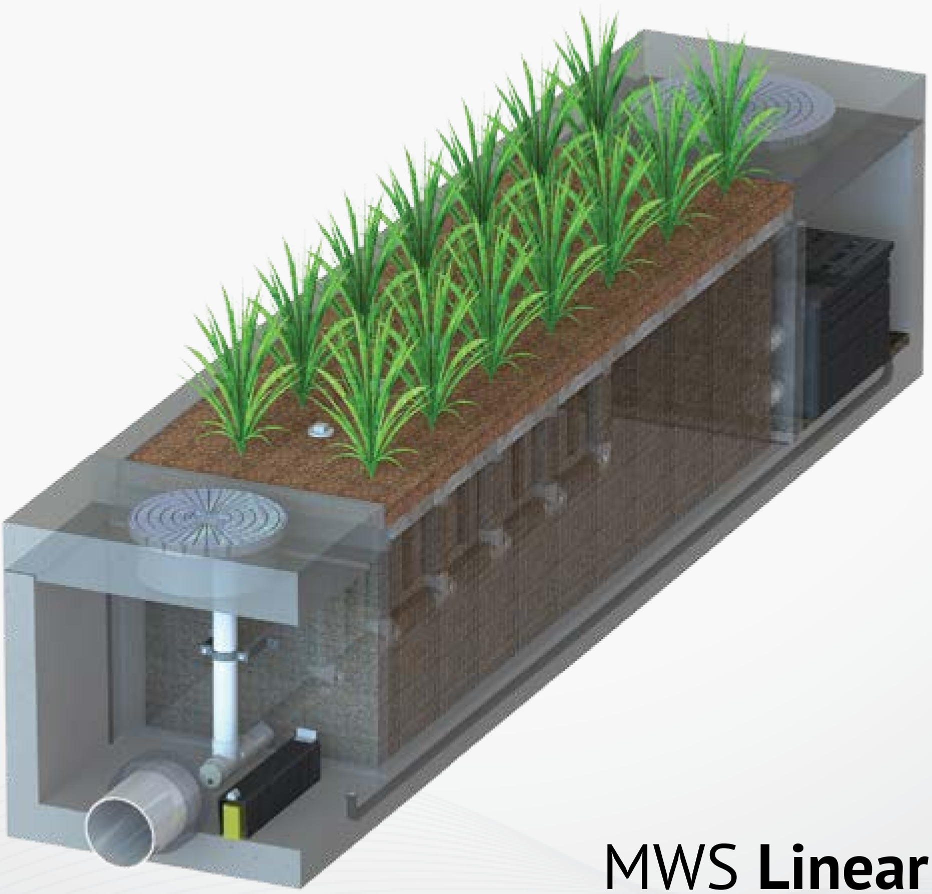
Ecology: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
(360) 407-6444
douglas.howie@ecy.wa.gov

Revision History

Date	**Revision**
June 2011	Original use-level-designation document
September 2012	Revised dates for TER and expiration
January 2013	Modified Design Storm Description, added Revision Table, added maintenance discussion, modified format in accordance with Ecology standard
December 2013	Updated name of Applicant
April 2014	Approved GULD designation for Basic, Phosphorus, and Enhanced treatment

MODULAR WETLANDS™

Advanced ***Stormwater*** *Biofiltration*

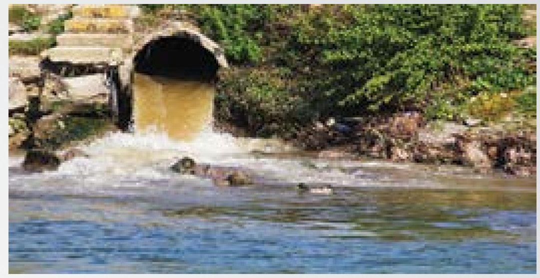


MWS **Linear**

Contents

The Urban Impact

For hundreds of years natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as our cities grow and develop, these natural wetlands have perished under countless roads, rooftops, and parking lots.



Plant A Wetland

Without natural wetlands our cities are deprived of water purification, flood control, and land stability. Modular Wetlands and the MWS Linear re-establish nature's presence and rejuvenate water ways in urban areas.

MWS **Linear**

The Modular Wetland System Linear represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint and higher treatment capacity. While most biofilters use little or no pre-treatment, the MWS Linear incorporates an advanced pre-treatment chamber that includes separation and pre-filter cartridges. In this chamber sediment and hydrocarbons are removed from runoff before it enters the biofiltration chamber, in turn reducing maintenance costs and improving performance.

Applications

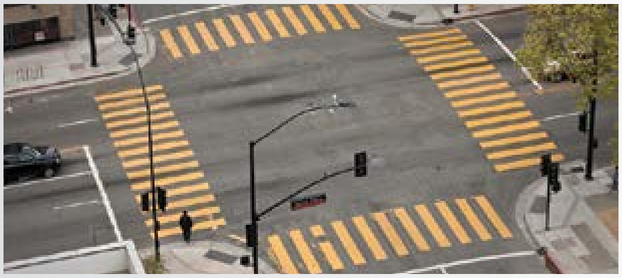
The MWS Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.

Industrial

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA mandated effluent limits for dissolved metals and other pollutants.

Residential

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.



Streets

Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.

Parking Lots

Parking lots are designed to maximize space and the MWS Linear's 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.

Commercial

Compared to bioretention systems, the MWS Linear can treat far more area in less space - meeting treatment and volume control requirements.

Mixed Use

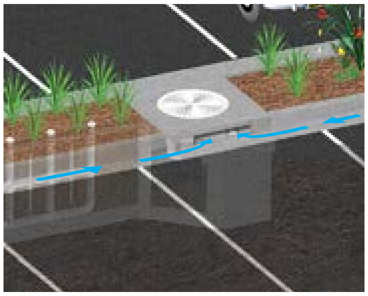
The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications are available on our website: www.ModularWetlands.com/Applications

- Agriculture
- Reuse
- Low Impact Development
- Waste Water

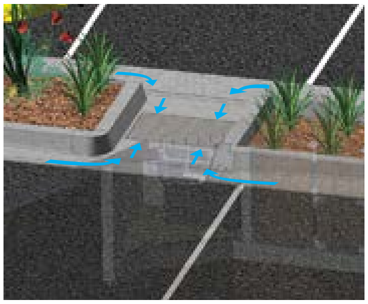
Configurations

The MWS Linear is the preferred biofiltration system of Civil Engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your stormdrain design.



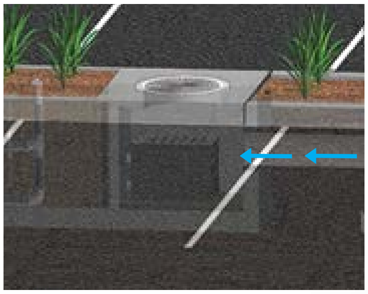
Curb Type

The *Curb Type* configuration accepts sheet flow through a curb opening and is commonly used along road ways and parking lots. It can be used in sump or flow by conditions. Length of curb opening varies based on model and size.



Grate Type

The *Grate Type* configuration offers the same features and benefits as the *Curb Type* but with a grated/drop inlet above the systems pre-treatment chamber. It has the added benefit of allowing for pedestrian access over the inlet. ADA compliant grates are available to assure easy and safe access. The *Grate Type* can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



Vault Type

The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pre-treatment chamber, meaning the MWS Linear can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/bioretention systems. Another benefit of the "pipe in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.

Downspout Type

The *Downspout Type* is a variation of the *Vault Type* and is designed to accept a vertical downspout pipe from roof top and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

Advantages & Operation

The MWS Linear is the most efficient and versatile biofiltration system on the market, and the only system with horizontal flow which improves performance, reduces footprint, and minimizes maintenance. Figure-1 and Figure-2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

Featured Advantages

- Horizontal Flow Biofiltration
- Greater Filter Surface Area
- Pre-Treatment Chamber
- Patented Perimeter Void Area
- Flow Control
- No Depressed Planter Area

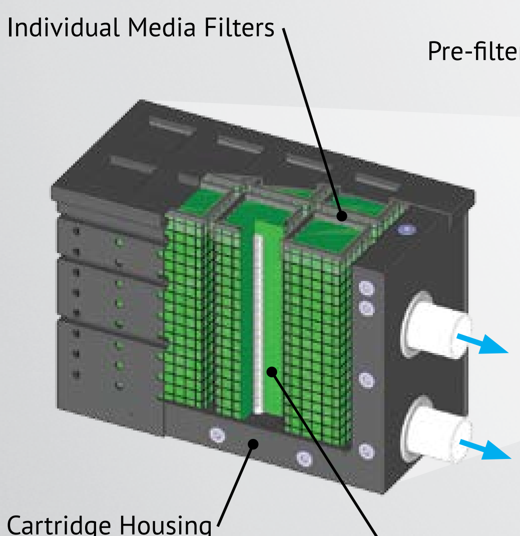
1 Pre-Treatment

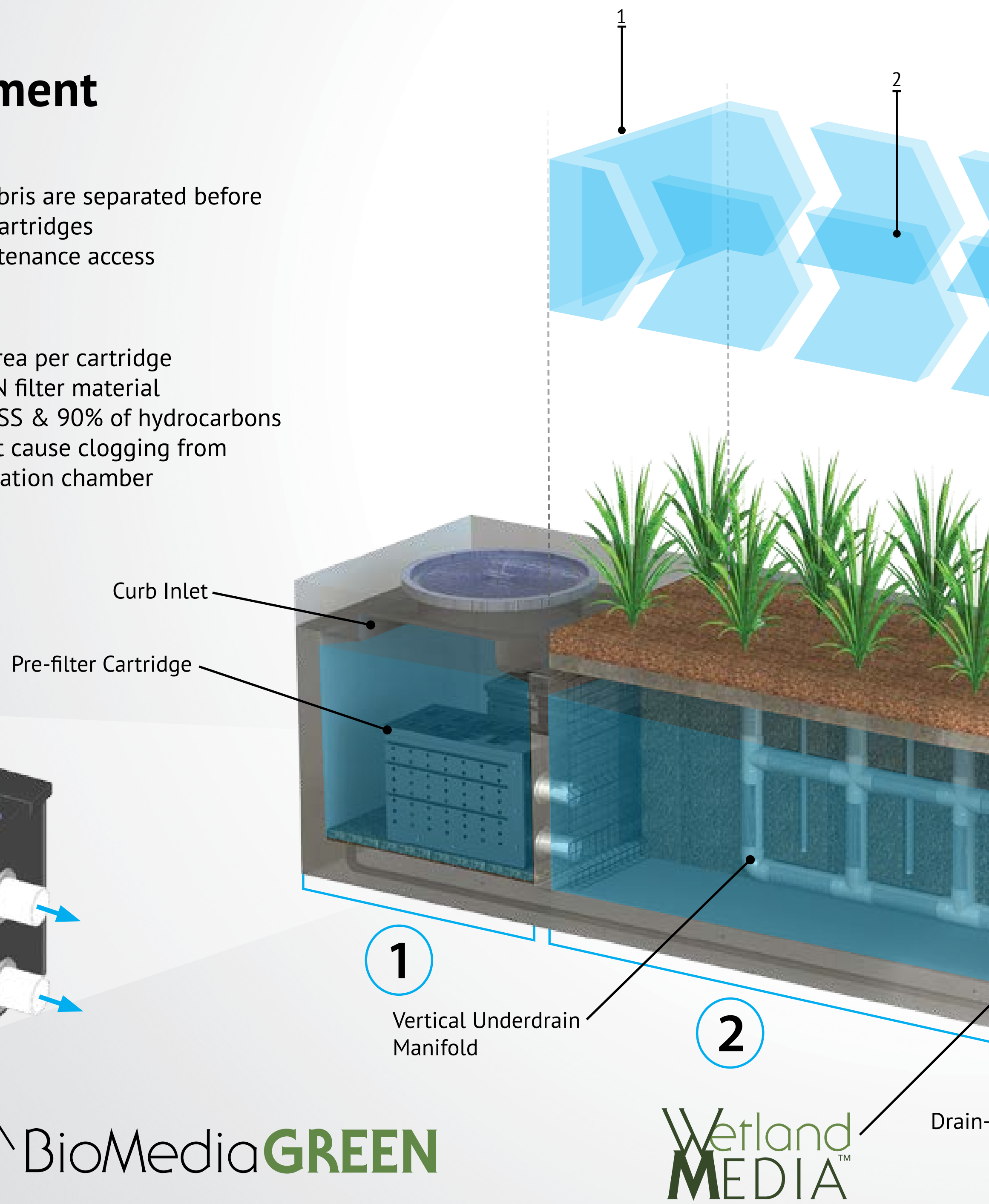
Separation

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

Pre-Filter Cartridges

- Over 25 ft^2 of surface area per cartridge
- Utilizes BioMediaGREEN filter material
- Removes over 80% of TSS & 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber





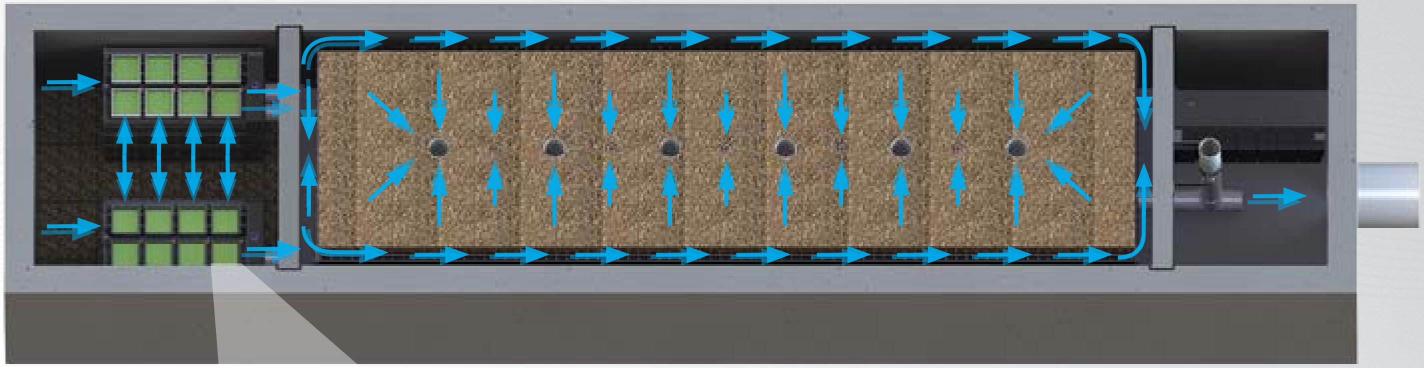
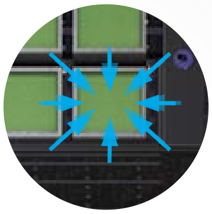


Fig. 2 - Top View



2x to 3x More Surface Area Than Traditional Downward Flow Bioretention Systems.

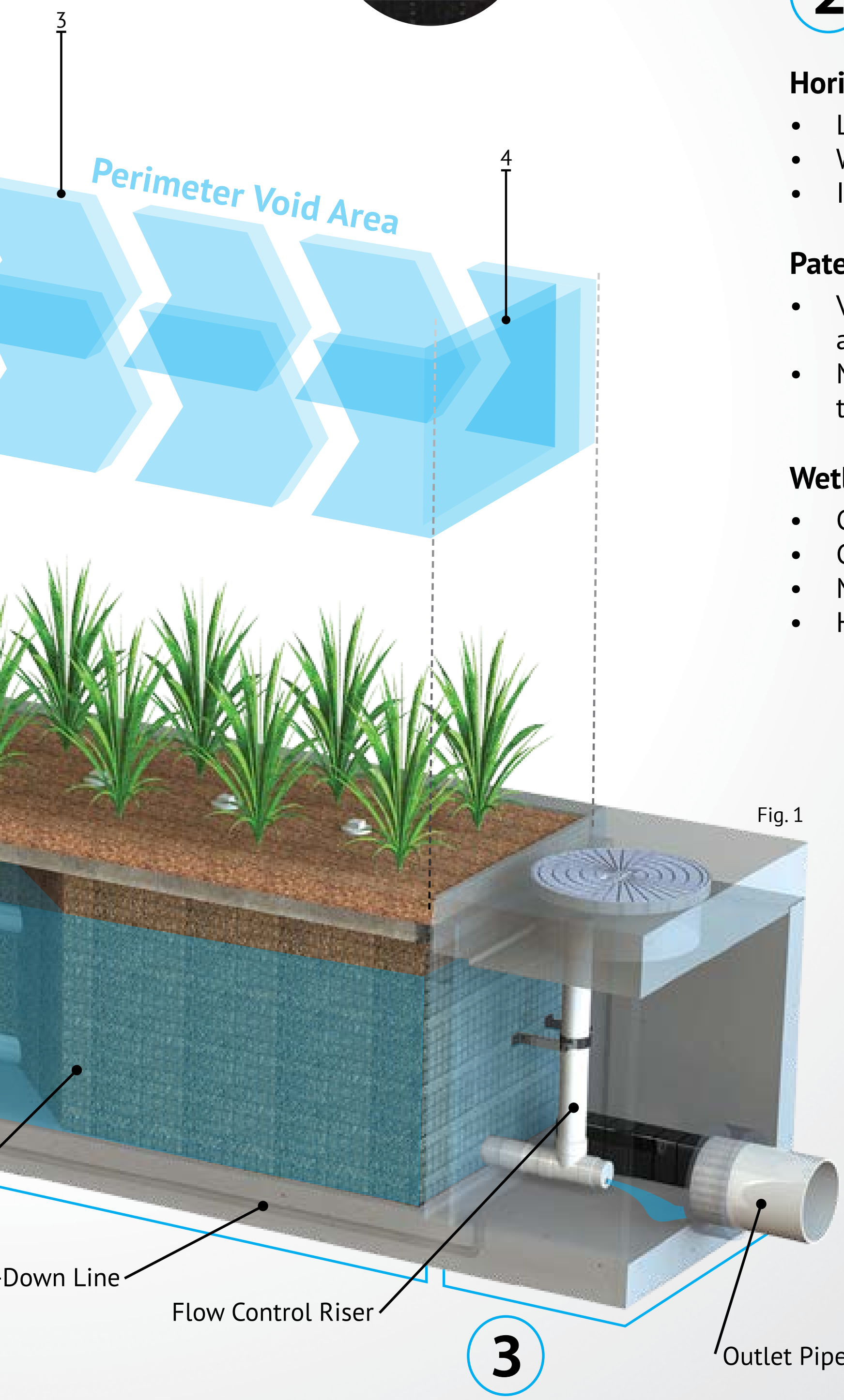


Fig. 1

2 Biofiltration

Horizontal Flow

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

Patented Perimeter Void Area

- Vertically extends void area between the walls and the WetlandMEDIA on all four sides.
- Maximizes surface area of the media for higher treatment capacity

WetlandMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and light weight

3 Discharge

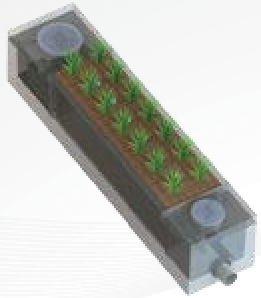
Flow Control

- Orifice plate controls flow of water through WetlandMEDIA to a level lower than the media's capacity.
- Extends the life of the media and improves performance

Drain-Down Filter

- The Drain-Down is an optional feature that completely drains the pre-treatment chamber
- Water that drains from the pre-treatment chamber between storm events will be treated

Orientations



Side-By-Side

The *Side-By-Side* orientation places the pre-treatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.

End-To-End

The *End-To-End* orientation places the pre-treatment and discharge chambers on opposite ends of the biofiltration chamber therefore minimizing the width of the system to 5 ft (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is bypass must be external.

Bypass

Internal Bypass Weir (Side-by-Side Only)

The *Side-By-Side* orientation places the pre-treatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pre-treatment chamber directly to the discharge chamber.

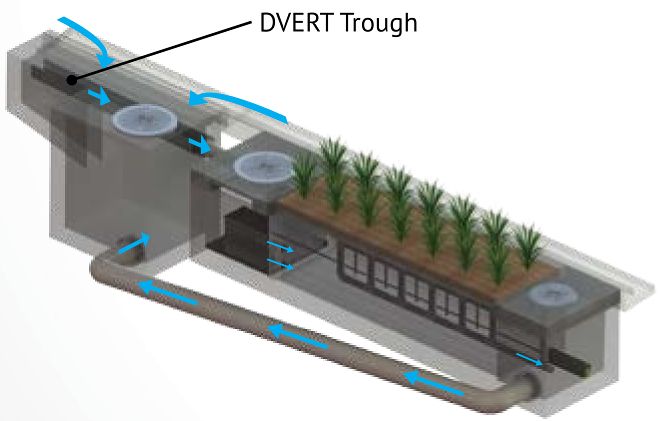
External Diversion Weir Structure

This traditional offline diversion method can be used with the MWS Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

Flow By Design

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT Low Flow Diversion



This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the MWS Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allows the MWS Linear to be installed anywhere space is available.


Performance

The MWS Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country. With it's advanced pre-treatment chamber and innovative horizontal flow biofilter, the system is able to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. With the same biological processes found in natural wetlands, the MWS Linear harnesses natures ability to process, transform, and remove even the most harmful pollutants.

Approvals

The MWS Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation, and perhaps the world.

State of Washington TAPE GULD Basic Enhanced/Metals Phosphorus

Washington State TAPE Approved

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft^2 loading rate. The highest performing BMP on the market for all main pollutant categories.

TSS	Total Phosphorus	Ortho Phosphorus	Nitrogen	Dissolved Zinc	Dissolved Copper	Total Zinc	Total Copper	Motor Oil
85%	64%	67%	45%	66%	38%	69%	50%	95%

VA

DEQ Assignment

The Virginia Department of Environmental Quality assigned the MWS Linear, the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) Technical Criteria.

MD

Maryland Department Of The Environment Approved

Granted ESD (Environmental Site Design) status for new construction, redevelopment and retrofitting when designed in accordance with the Design Manual.

MA

MASTEP Evaluation

The University of Massachusetts at Amherst – Water Resources Research Center, issued a technical evaluation report noting removal rates up to 84% TSS, 70% Total Phosphorus, 68.5% Total Zinc, and more.

RI

Rhode Island DEM Approved

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% Pathogens, 30% Total Phosphorus, and 30% Total Nitrogen.

Flow Based Sizing

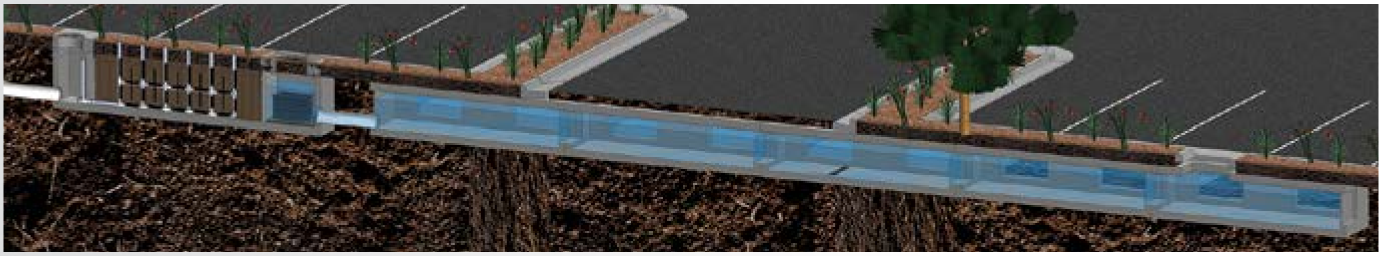
The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

Treatment Flow Sizing Table

Model #	Dimensions	WetlandMedia Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 ft^2	0.052
MWS-L-4-6	4' x 6'	32 ft^2	0.073
MWS-L-4-8	4' x 8'	50 ft^2	0.115
MWS-L-4-13	4' x 13'	63 ft^2	0.144
MWS-L-4-15	4' x 15'	76 ft^2	0.175
MWS-L-4-17	4' x 17'	90 ft^2	0.206
MWS-L-4-19	4' x 19'	103 ft^2	0.237
MWS-L-4-21	4' x 21'	117 ft^2	0.268
MWS-L-8-8	8' x 8'	100 ft^2	0.230
MWS-L-8-12	8' x 12'	151 ft^2	0.346
MWS-L-8-16	8' x 16'	201 ft^2	0.462

Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.



Treatment Volume Sizing Table

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

Installation

The MWS Linear is simple, easy to install, and has a space efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles pre-cast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians are available to supervise installations and provide technical support.

Maintenance

Reduce your maintenance costs, man hours, and materials with the MWS Linear. Unlike other biofiltration systems that provide no pre-treatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pre-treatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pre-treatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pre-treatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long term operation and there is absolutely no need to replace expensive biofiltration media.

Plant Selection

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the MWS Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more "contact time" so that pollutants are more successfully decomposed, volatilized and incorporated into the biomass of The MWS Linear's micro/macro flora and fauna.

A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by selecting the list relative to your project location's hardy zone.

Please visit **www.ModularWetlands.com/Plants** for more information and various plant lists.

Attachment 2
Backup for PDP Hydromodification Control Measures

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

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Project Name:

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☑ Included See Hydromodification Management Exhibit Checklist.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☑ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☑ Not Performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design and Structural BMP Drawdown Calculations (Required) Overflow Design Summary for each structural BMP See Chapter 6 and Appendix G of the BMP Design Manual	☑ Included ☐ Submitted as separate stand-alone document

Project Name:

Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

- ☑ Underlying hydrologic soil group
- ☑ Approximate depth to groundwater
- ☑ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☑ Critical coarse sediment yield areas to be protected OR provide a separate map showing that the project site is outside of any critical coarse sediment yield areas
- ☑ Existing topography
- ☑ Existing and proposed site drainage network and connections to drainage offsite
- ☑ Proposed grading
- ☑ Proposed impervious features
- ☑ Proposed design features and surface treatments used to minimize imperviousness
- ☑ Point(s) of Compliance (POC) for Hydromodification Management
  Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
- ☐ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail).

Attachment 2b is combined with Attachment 1a.

Attachment 2b - CCSYA's Per Google Earth kmz

ATTACHMENT 2d
FLOW CONTROL FACILITY DESIGN

Per Attachment 1e, the project will use five Modular Wetland System Linear BMPs for pollutant control. The MWS-Linear BMPs are TAPE-certified and have been used for similar recent projects approved by the city of San Diego. However, this submittal is for project entitlements. It is possible for an equivalent acceptable BMP to be selected during final engineering.

Underground vaults capture the storm runoff and provide flow control prior to the MWS Linear BMPs. For this preliminary SWQMP, the vault volume and draw down time are estimated for the project area draining to the east POC (BMP 1, BMP 2, and BMP 3) and the project area draining to the west POC (BMP 4 and BMP 5). The volume and draw down time are used to verify feasibility of a vault. The vault sizing and type will be selected during final engineering along with structural and other details.

For this preliminary SWQMP, the vault volume is estimated using the BMP Sizing Spreadsheet v3.0 (attached). The vault sizing is based on the *Storm Water Standards* Cistern sizing factors. The project contains hydrologic soil group D, has a flat slope, and is the Lindbergh gage. Furthermore, the preliminary SWQMP does not include a geomorphic assessment so $0.1Q_2$ is assumed. A geomorphic assessment could be performed during final engineering, if desired. In addition, continuous simulation modeling can be performed during final engineering to reduce the flow control volume requirement.

The attached BMP Sizing Spreadsheet results were used to determine the minimum volume as well as the maximum allowable orifice flow (the cistern depth information was not used). Civil Sense, Inc. then determined each vault's dimensions for the required volume. This data was used to determine the drawdown time for each vault. The attached contains the drawdown formula and calculations. The orifice equation is used first based on the vault height. The orifice size for each vault is selected that achieves the maximum allowable orifice outflow under the given height. The outflow and vault volume are then used to determine the drawdown. Each vault has a drawdown less than 96 hours, so meets the hydromodification criteria.

Green Streets

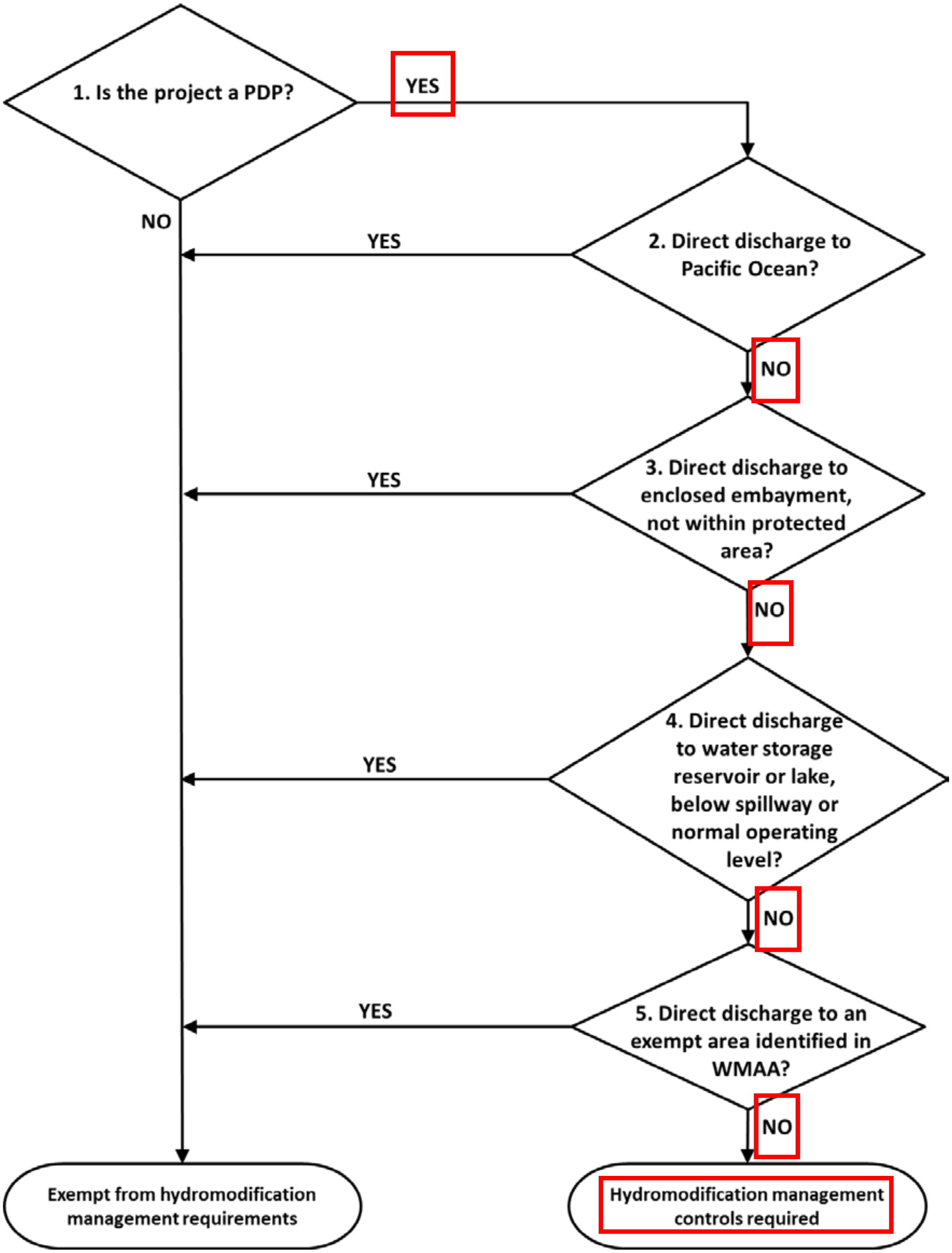
Otay Mesa Road is being improved (widening, curb, gutter, and sidewalk) along the project site. These public street improvements will satisfy water quality requirements by meeting the "green street" standards. In pursuing a green street approach, the project will be exempt from Priority Development Project (PDP) designation, per PDP Exemption Category 2 as stated in Appendix J of the City of San Diego's 2018 *Storm Water Standards*.

A landscape buffer will be provided between the curb and sidewalk. The project will use the following green street elements from *Storm Water Standards* Appendix J.2:

- Vegetated Swales – the landscape buffers can contain vegetated swales.
- Sidewalk Planters – the landscape buffers can contain sidewalk planters.
- Permeable Surfaces – the landscape buffers be permeable surfaces.

These elements will be incorporated along the entire landscape buffer areas within the public right-of-way. The project's maintenance company will be responsible for ongoing maintenance of the landscape buffers. Since the project proposes multi-family development, maintenance of these areas can be readily included in the overall site maintenance. As this project is exempt from PDP requirements, green streets elements are not considered BMPs, thus tracking of greens streets elements will not be required by the SDRWQCB. However, maintenance activities are necessary to ensure BMP's are functioning as designed and will provide storm water quality control (or management) prior to discharging to the MS4. See attached form.

may require upgrading and may also disqualify the HMP exemption at the discretion of the City Engineer.



*Direct discharge refers to an uninterrupted hardened conveyance system; Note to be used in conjunction with Node Descriptions.

Figure 1-2. Applicability of Hydromodification Management BMP Requirements

Drawdown Time Calculations

Low Flow Orifice Discharge

1) $Q = C_d \times A \times (2gH)^{0.5}$

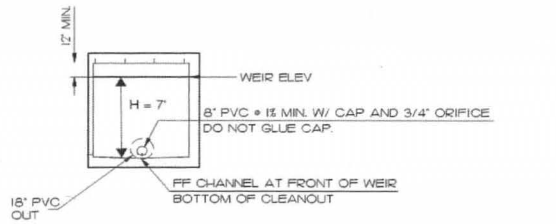
Orifice Discharge Equation

C_d = Orifice Coefficient = 0.60 (sharp, clean edge

H = Water Head above orifice

g = Gravitational Acceleration = 32.2 ft/s^2

A = Area of the Orifice



MODIFIED STORM DRAIN CLEANOUT
TYPE A-6 PER D-9 W/ WEIR (ONLY OUTLET BOX)
NO SCALE

BMP	Orifice Coefficient Cd	Orifice Diameter (inches)	Max. Orifice Area ($inch^2$)	Gravitational Acceleration ft/s^2	H (in)	H (ft)	Orifice Discharge Q (cfs)
1	0.6	0.75	0.44	32.2	84	7	0.039
2	0.6	1.0000	0.79	32.2	84	7	0.069

Storage Volume

Drawdown Time

2) $D = V / Q_{Orifice}$ Drawdown Time

BMP	Surface Ponding Volume (cf)	$Q_{orifice}$ (cfs)	Drawdown Time (hours)	Conclusion
1	3656.0	0.039	26.0	< 96 hours - No Vector Control Required
2	5618.0	0.069	22.5	< 96 hours - No Vector Control Required

DRAWDOWN

BMP	C	Orifice Dia., in	Area, sq. in.	G	H, ft	Q, cfs	Volume, cf	Drawdown, hrs
1	0.6	2.21	3.84	32.2	9	0.385	28,879	20.8
2	0.6	0.38	0.11	32.2	6	0.009	773	23.1
3	0.6	0.38	0.11	32.2	6	0.009	760	22.7
4	0.6	0.35	0.10	32.2	5	0.007	554	21.4
5	0.6	0.35	0.10	32.2	5	0.007	541	20.9

G.2.5 Sizing Factors for "Cistern" BMP

Table G.2-6 presents sizing factors for calculating the required volume (V) for a cistern BMP. In this context, a "cistern" is a detention facility that stores runoff and releases it at a controlled rate. A cistern can be a component of a harvest and use system, however the sizing factor method will not account for any retention occurring in the system. The sizing factors were developed assuming runoff is released from the cistern. The sizing factors presented in this section are to meet the hydromodification management performance standard only. The cistern BMP is based on the following assumptions:

- **Cistern configuration**: The cistern is modeled as a 4-foot tall vessel. However, designers could use other configurations (different cistern heights), as long as the lower outlet orifice is sized to properly restrict outflows and the minimum required volume is provided.

- **Cistern upper outlet**: The upper outlet from the cistern would consist of a weir or other flow control structure with the overflow invert set at an elevation of 7/8 of the water height associated with the required volume of the cistern – V. For the assumed 4-foot water depth in the cistern associated with the sizing factor analysis, the overflow invert is assumed to be located at an elevation of 3.5 feet above the bottom of the cistern. The overflow weir would be sized to pass the peak design flow based on the tributary drainage area.

How to use the sizing factors:

Obtain sizing factors from Table G.2-6 based on the project's lower flow threshold fraction of Q_2, hydrologic soil group, post-project slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required volume (V, cubic feet). Select a low flow orifice that will discharge the lower flow threshold flow at the overflow elevation (i.e. when there is 3.5 feet of head over the lower outlet orifice or adjusted head as appropriate if the cistern overflow elevation is not 3.5 feet tall). The civil engineer shall provide the necessary volume of the BMP and the lower outlet orifice detail on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

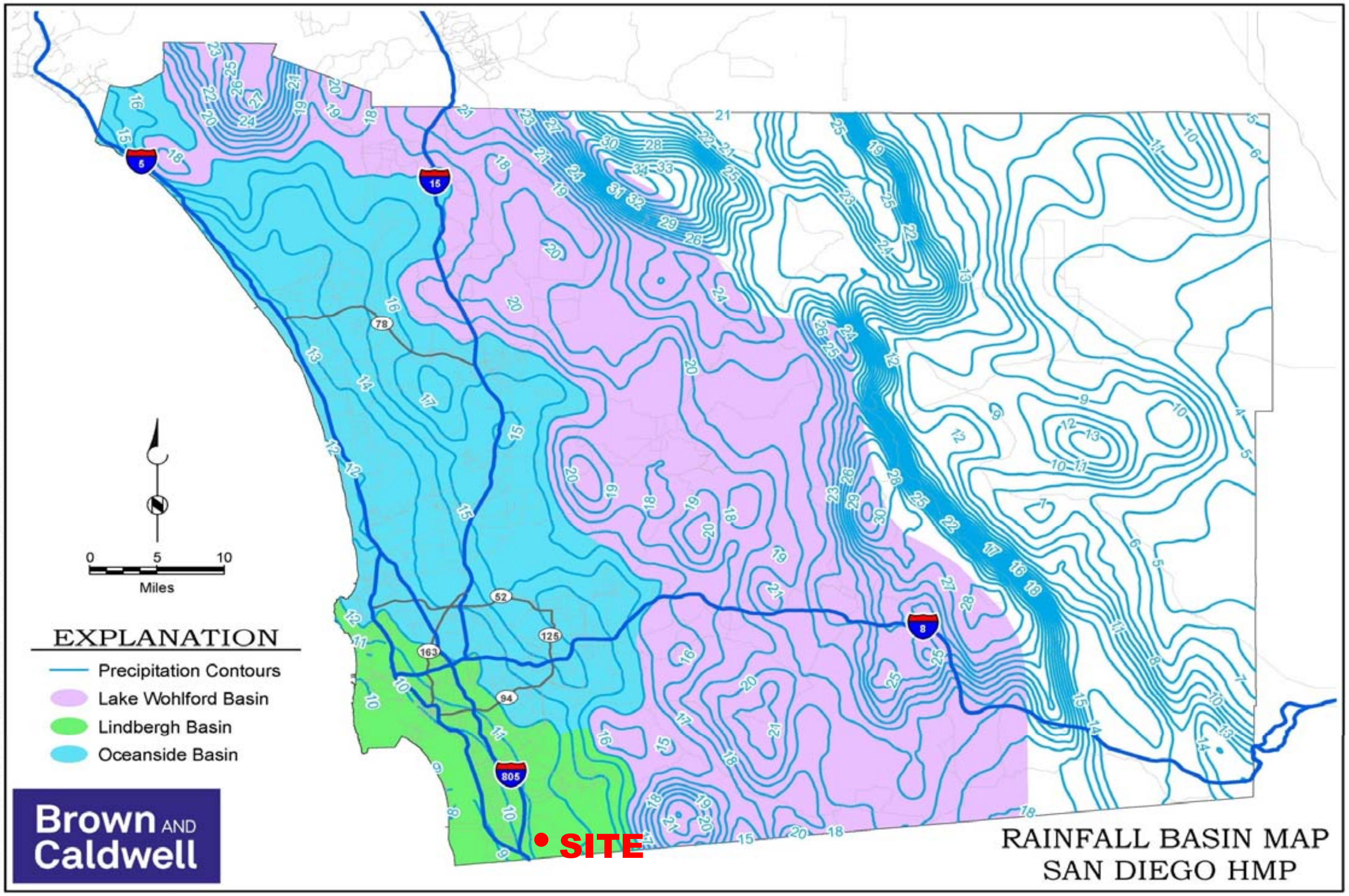
A cistern could be a component of a full retention, partial retention, or no retention BMP depending on how the outflow is disposed. However, use of the sizing factor method for design of the cistern in a combined pollutant control and flow control system is not recommended. The sizing factor method for designing a cistern does not account for any retention or storage occurring in BMPs combined with the cistern (i.e., cistern sized using sizing factors may be larger than necessary because sizing factor method does not recognize volume losses occurring in other elements of a combined system). Furthermore, when the cistern is designed using the sizing factor method, the cistern outflow must be set to the low flow threshold flow for the drainage area, which may be inconsistent with requirements for other elements of a combined system. To optimize a system in which a cistern provides temporary storage for runoff to be either used onsite (harvest and use), infiltrated, or biofiltered, project-specific continuous simulation modeling is recommended. Refer to Sections 5.6 and 6.3.6.

Table G.2-6: Sizing Factors for Hydromodification Flow Control Cistern BMPs Designed Using Sizing Factor Method

Lower Flow Threshold	Soil Group	Slope	Rain Gauge	V
$0.1Q_2$	A	Flat	Lindbergh	0.54
$0.1Q_2$	A	Moderate	Lindbergh	0.51
$0.1Q_2$	A	Steep	Lindbergh	0.49
$0.1Q_2$	B	Flat	Lindbergh	0.19
$0.1Q_2$	B	Moderate	Lindbergh	0.18
$0.1Q_2$	B	Steep	Lindbergh	0.18
$0.1Q_2$	C	Flat	Lindbergh	0.11
$0.1Q_2$	C	Moderate	Lindbergh	0.11
$0.1Q_2$	C	Steep	Lindbergh	0.11
$0.1Q_2$	D	Flat	Lindbergh	0.09
$0.1Q_2$	D	Moderate	Lindbergh	0.09
$0.1Q_2$	D	Steep	Lindbergh	0.09
$0.1Q_2$	A	Flat	Oceanside	0.26
$0.1Q_2$	A	Moderate	Oceanside	0.25
$0.1Q_2$	A	Steep	Oceanside	0.25
$0.1Q_2$	B	Flat	Oceanside	0.16
$0.1Q_2$	B	Moderate	Oceanside	0.16
$0.1Q_2$	B	Steep	Oceanside	0.16
$0.1Q_2$	C	Flat	Oceanside	0.14
$0.1Q_2$	C	Moderate	Oceanside	0.14
$0.1Q_2$	C	Steep	Oceanside	0.14
$0.1Q_2$	D	Flat	Oceanside	0.12
$0.1Q_2$	D	Moderate	Oceanside	0.12
$0.1Q_2$	D	Steep	Oceanside	0.12
$0.1Q_2$	A	Flat	L Wohlford	0.53
$0.1Q_2$	A	Moderate	L Wohlford	0.49
$0.1Q_2$	A	Steep	L Wohlford	0.49
$0.1Q_2$	B	Flat	L Wohlford	0.28
$0.1Q_2$	B	Moderate	L Wohlford	0.28
$0.1Q_2$	B	Steep	L Wohlford	0.28

Lower Flow Threshold	Soil Group	Slope	Rain Gauge	V
$0.1Q_2$	C	Flat	L Wohlford	0.14
$0.1Q_2$	C	Moderate	L Wohlford	0.14
$0.1Q_2$	C	Steep	L Wohlford	0.14
$0.1Q_2$	D	Flat	L Wohlford	0.12
$0.1Q_2$	D	Moderate	L Wohlford	0.12
$0.1Q_2$	D	Steep	L Wohlford	0.12

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
V = Cistern volume sizing factor



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BMP Sizing Spreadsheet V3.0

Project Name:	PA-61
Project Applicant:	Pardee Homes
Jurisdiction:	City of San Diego
Parcel (APN):	645-080-16
Hydrologic Unit:	Otay Valley
Rain Gauge:	Lindbergh
Total Project Area (sf):	3,419,411
Channel Susceptibility:	High

BMP Sizing Spreadsheet V3.0			
Project Name:	PA-61	Hydrologic Unit:	Otay Valley
Project Applicant:	Pardee Homes	Rain Gauge:	Lindbergh
Jurisdiction:	City of San Diego	Total Project Area:	3,419,411
Parcel (APN):	645-080-16	Low Flow Threshold:	0.1Q2
BMP Name:	BMP 1	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
Roofs	164,413	D	Flat	Roofs	1.0	0.09	14797
Hardscape	24,868	D	Flat	Concrete	1.0	0.09	2238
Streets	106,336	D	Flat	Concrete	1.0	0.09	9570
Driveways	17,379	D	Flat	Concrete	1.0	0.09	1564
Landscaping	78,775	D	Flat	Landscape	0.1	0.09	709
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	391,771					Minimum BMP Size	28879
						Proposed BMP Size*	28879

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint)	8251	CF

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, April 2018. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V3.0			
Project Name:	PA-61	Hydrologic Unit:	Otay Valley
Project Applicant:	Pardee Homes	Rain Gauge:	Lindbergh
Jurisdiction:	City of San Diego	Total Project Area:	3,419,411
Parcel (APN):	645-080-16	Low Flow Threshold:	0.1Q2
BMP Name	BMP 1	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - $\%Q_2$ (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
Roofs	Lindbergh	D	Flat	0.429	3.774	0.162	**2.39**
Hardscape	Lindbergh	D	Flat	0.429	0.571	0.024	**0.36**
Streets	Lindbergh	D	Flat	0.429	2.441	0.105	**1.55**
Driveways	Lindbergh	D	Flat	0.429	0.399	0.017	**0.25**
Landscaping	Lindbergh	D	Flat	0.429	1.808	0.078	**1.14**

3.50	**0.386**	**5.69**	**2.69**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.385**	**5.68**	**2.690**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

BMP Sizing Spreadsheet V3.0			
Project Name:	PA-61	Hydrologic Unit:	Otay Valley
Project Applicant:	Pardee Homes	Rain Gauge:	Lindbergh
Jurisdiction:	City of San Diego	Total Project Area:	3,419,411
Parcel (APN):	645-080-16	Low Flow Threshold:	0.1Q2
BMP Name:	BMP 2	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
Roofs	0	D	Flat	Roofs	1.0	0.09	0
Hardscape	1,091	D	Flat	Concrete	1.0	0.09	98
Streets	7,400	D	Flat	Concrete	1.0	0.09	666
Driveways	0	D	Flat	Concrete	1.0	0.09	0
Landscaping	1,029	D	Flat	Landscape	0.1	0.09	9
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	9,520					Minimum BMP Size	773
						Proposed BMP Size*	773

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint)	221	CF

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

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BMP Sizing Spreadsheet V3.0			
Project Name:	PA-61	Hydrologic Unit:	Otay Valley
Project Applicant:	Pardee Homes	Rain Gauge:	Lindbergh
Jurisdiction:	City of San Diego	Total Project Area:	3,419,411
Parcel (APN):	645-080-16	Low Flow Threshold:	0.1Q2
BMP Name	BMP 2	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q_2 (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
Roofs	Lindbergh	D	Flat	0.429	0.000	0.000	**0.00**
Hardscape	Lindbergh	D	Flat	0.429	0.025	0.001	**0.02**
Streets	Lindbergh	D	Flat	0.429	0.170	0.007	**0.11**
Driveways	Lindbergh	D	Flat	0.429	0.000	0.000	**0.00**
Landscaping	Lindbergh	D	Flat	0.429	0.024	0.001	**0.01**

3.50	**0.009**	**0.14**	**0.42**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.009**	**0.14**	**0.420**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

BMP Sizing Spreadsheet V3.0			
Project Name:	PA-61	Hydrologic Unit:	Otay Valley
Project Applicant:	Pardee Homes	Rain Gauge:	Lindbergh
Jurisdiction:	City of San Diego	Total Project Area:	3,419,411
Parcel (APN):	645-080-16	Low Flow Threshold:	0.1Q2
BMP Name:	BMP 3	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
Roofs	0	D	Flat	Roofs	1.0	0.09	0
Hardscape	1,236	D	Flat	Concrete	1.0	0.09	111
Streets	7,084	D	Flat	Concrete	1.0	0.09	638
Driveways	0	D	Flat	Concrete	1.0	0.09	0
Landscaping	1,194	D	Flat	Landscape	0.1	0.09	11
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	9,514					Minimum BMP Size	760
						Proposed BMP Size*	760

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint)	217	CF

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

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This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, April 2018. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V3.0			
Project Name:	PA-61	Hydrologic Unit:	Otay Valley
Project Applicant:	Pardee Homes	Rain Gauge:	Lindbergh
Jurisdiction:	City of San Diego	Total Project Area:	3,419,411
Parcel (APN):	645-080-16	Low Flow Threshold:	0.1Q2
BMP Name	BMP 3	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q_2 (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
Roofs	Lindbergh	D	Flat	0.429	0.000	0.000	**0.00**
Hardscape	Lindbergh	D	Flat	0.429	0.028	0.001	**0.02**
Streets	Lindbergh	D	Flat	0.429	0.163	0.007	**0.10**
Driveways	Lindbergh	D	Flat	0.429	0.000	0.000	**0.00**
Landscaping	Lindbergh	D	Flat	0.429	0.027	0.001	**0.02**

3.50	**0.009**	**0.14**	**0.42**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.009**	**0.14**	**0.420**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

BMP Sizing Spreadsheet V3.0			
Project Name:	PA-61	Hydrologic Unit:	Otay Valley
Project Applicant:	Pardee Homes	Rain Gauge:	Lindbergh
Jurisdiction:	City of San Diego	Total Project Area:	3,419,411
Parcel (APN):	645-080-16	Low Flow Threshold:	0.1Q2
BMP Name:	BMP 4	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
Roofs	0	D	Flat	Roofs	1.0	0.09	0
Hardscape	1,853	D	Flat	Concrete	1.0	0.09	167
Streets	4,211	D	Flat	Concrete	1.0	0.09	379
Driveways	0	D	Flat	Concrete	1.0	0.09	0
Landscaping	971	D	Flat	Landscape	0.1	0.09	9
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	7,035					Minimum BMP Size	554
						Proposed BMP Size*	554

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint)	158	CF

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, April 2018. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V3.0			
Project Name:	PA-61	Hydrologic Unit:	Otay Valley
Project Applicant:	Pardee Homes	Rain Gauge:	Lindbergh
Jurisdiction:	City of San Diego	Total Project Area:	3,419,411
Parcel (APN):	645-080-16	Low Flow Threshold:	0.1Q2
BMP Name	BMP 4	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - $\%Q_2$ (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
Roofs	Lindbergh	D	Flat	0.429	0.000	0.000	**0.00**
Hardscape	Lindbergh	D	Flat	0.429	0.043	0.002	**0.03**
Streets	Lindbergh	D	Flat	0.429	0.097	0.004	**0.06**
Driveways	Lindbergh	D	Flat	0.429	0.000	0.000	**0.00**
Landscaping	Lindbergh	D	Flat	0.429	0.022	0.001	**0.01**

3.50	**0.007**	**0.10**	**0.36**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.007**	**0.10**	**0.360**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

BMP Sizing Spreadsheet V3.0			
Project Name:	PA-61	Hydrologic Unit:	Otay Valley
Project Applicant:	Pardee Homes	Rain Gauge:	Lindbergh
Jurisdiction:	City of San Diego	Total Project Area:	3,419,411
Parcel (APN):	645-080-16	Low Flow Threshold:	0.1Q2
BMP Name:	BMP 5	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
Roofs	0	D	Flat	Roofs	1.0	0.09	0
Hardscape	1,567	D	Flat	Concrete	1.0	0.09	141
Streets	4,342	D	Flat	Concrete	1.0	0.09	391
Driveways	0	D	Flat	Concrete	1.0	0.09	0
Landscaping	1,059	D	Flat	Landscape	0.1	0.09	10
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	6,968					Minimum BMP Size	541
						Proposed BMP Size*	541

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint)	155	CF

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, April 2018. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V3.0			
Project Name:	PA-61	Hydrologic Unit:	Otay Valley
Project Applicant:	Pardee Homes	Rain Gauge:	Lindbergh
Jurisdiction:	City of San Diego	Total Project Area:	3,419,411
Parcel (APN):	645-080-16	Low Flow Threshold:	0.1Q2
BMP Name	BMP 5	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio	DMA Area (ac)	Orifice Flow - %Q_2	Orifice Area
		Soil Type	Slope	(cfs/ac)		(cfs)	(in^2)
Roofs	Lindbergh	D	Flat	0.429	0.000	0.000	**0.00**
Hardscape	Lindbergh	D	Flat	0.429	0.036	0.002	**0.02**
Streets	Lindbergh	D	Flat	0.429	0.100	0.004	**0.06**
Driveways	Lindbergh	D	Flat	0.429	0.000	0.000	**0.00**
Landscaping	Lindbergh	D	Flat	0.429	0.024	0.001	**0.02**

3.50	**0.007**	**0.10**	**0.36**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.007**	**0.10**	**0.360**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

Attachment 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

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Project Name:

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3	Maintenance Agreement (Form DS-3247) (when applicable)	☐ Included ☑ Not applicable

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Attachment 3: For private entity operation and maintenance, Attachment 3 must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

- ☐ Vicinity map
- ☐ Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
- ☐ BMP and HMP location and dimensions
- ☐ BMP and HMP specifications/cross section/model
- ☐ Maintenance recommendations and frequency
- ☐ LID features such as (permeable paver and LS location, dim, SF).

This is a Preliminary SWQMP. Attachment 3 will be provided in the Final SWQMP.

Attachment 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 4.

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Project Name:

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

- [x] Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
- [x] The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- [ ] Details and specifications for construction of structural BMP(s)
- [ ] Signage indicating the location and boundary of structural BMP(s) as required by the City Engineer
- [ ] How to access the structural BMP(s) to inspect and perform maintenance
- [ ] Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- [x] Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- [ ] Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- [ ] Recommended equipment to perform maintenance
- [ ] When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- [ ] Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- [ ] All BMPs must be fully dimensioned on the plans
- [ ] When proprietary BMPs are used, site specific cross section with outflow, inflow and model number shall be provided. Broucher photocopies are not allowed.

This is a Preliminary WQMP. The preliminary structural BMPs and above checked items are shown on the Vesting Tentative Map. The remaining checked items will be included on the final engineering plans.

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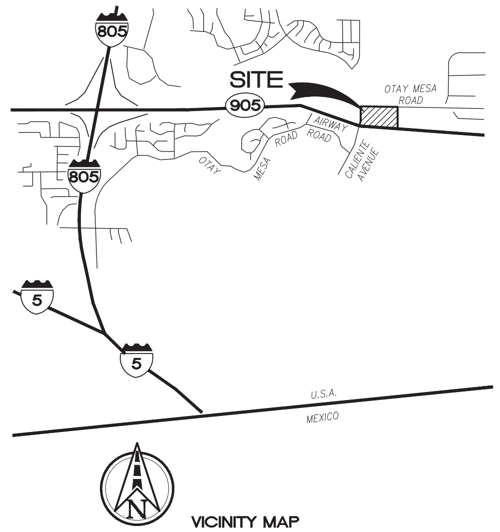
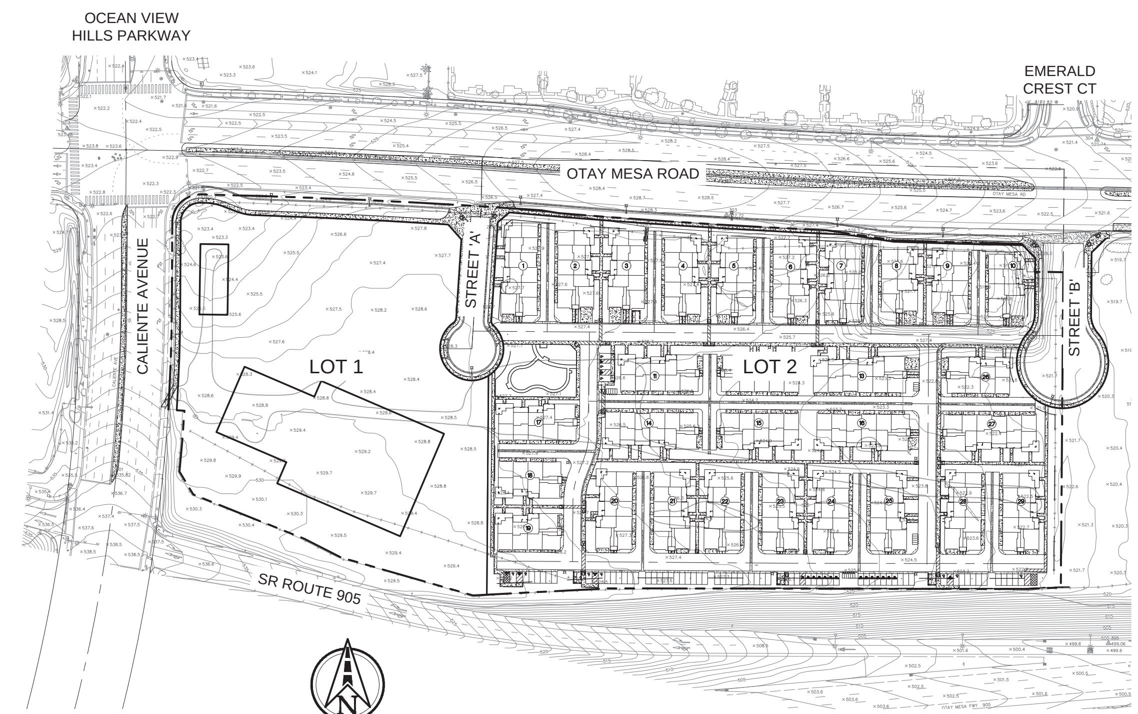
CALIFORNIA TERRACES - PA61

VESTING TENTATIVE MAP NO. 2152396
SITE DEVELOPMENT PERMIT NO. 2152399
MASTER PLANNED DEVELOPMENT PERMIT NO. 2192984
NEIGHBORHOOD DEVELOPMENT PERMIT NO. 2192974
COMMUNITY PLAN AMENDMENT LAND USE NO. 2152393
STREET VACATION NO. 2152395 AND REZONE NO. 2152398
CITY OF SAN DIEGO



VICINITY MAP

NOT TO SCALE



0 50 100 200 300
1 inch = 100 ft.

SITE PLAN

SCALE: 1" = 100'

OWNER / DEVELOPER

PARDEE HOMES
13400 SABRE SPRINGS PARKWAY, SUITE 200
SAN DIEGO, CA 92128
PHONE (858) 794–2500 FAX (858) 794–2599

CIVIL ENGINEER

CIVIL SENSE, INC.
13475 DANIELSON STREET, SUITE 150
POWAY, CA 92064
PHONE (858) 843–4253

LANDSCAPE ARCHITECT

PLACEWORKS
3 MACARTHUR PLACE, SUITE 1100
SANTA ANA, CA 92707
PHONE: (714) 966–9220

PUBLIC AFFAIRS

SOUTHWEST STRATEGIES, LLC
401 B STREET, SUITE 150
SAN DIEGO, CA 92101
PHONE (858) 541–7800
FAX (858) 541–7863

LEGAL DESCRIPTION

PARCEL 1:
ALL THAT PORTION OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 32, TOWNSHIP 18 SOUTH, RANGE 1 WEST, SAN BERNARDINO BASE AND MERIDIAN IN THE CITY OF SAN DIEGO COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 32, THENCE ALONG THE WESTERLY LINE OF SAID SECTION 32, SOUTH 00°18'24" WEST 348.92 FEET; THENCE SOUTH 61°46'14" EAST 309.64 FEET; THENCE SOUTH 72°16'59" EAST 1107.21 FEET TO AN INTERSECTION WITH THE EASTERLY LNE OF SAID NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SAID SECTION 32; THENCE ALONG SAID EASTERLY LINE NORTH 00°26'17" EAST 804.78 FEET TO AN INTERSECTION WITH THE NORTHERLY LINE OF SAID SECTION 32; THENCE ALONG SAID NORTHERLY LINE NORTH 88°48'52" WEST 1332.08 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM ONE–HALF OF ALL CRUDE OIL, PETROLEUM, GAS, BREA, ASPHALTUM AND KINDRED SUBSTANCES AND OTHER MINERALS UNDER AND IN SAID LAND. ALSO EXCEPTING THEREFROM THOSE PORTIONS THEREOF ACQUIRED BY THE CITY OF SAN DIEGO UNDER FINAL ORDER OF CONDEMNATION ISSUED OUT OF SUPERIOR COURT CASE NO. 708562–1, RECORDED JUNE 9, 1999 AS FILE NO. 1999–0400948, OF OFFICIAL RECORDS.

ALSO EXCEPTING THEREFROM THOSE PORTIONS THEREOF ACQUIRED BY THE STATE OF CALIFORNIA UNDER FINAL ORDER OF CONDEMNATION ISSUED OUT OF SUPERIOR COURT CASE NO. GIC 867930, RECORDED AUGUST 15, 2007 AS FILE NO. 2007–0544805 OFFICIAL RECORDS.

PARCEL 2:
THAT PORTION OF THE WEST ONE HALF OF THE NORTHWEST QUARTER OF SECTION 32, TOWNSHIP 18 SOUTH, RANGE 1 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, MORE PARTICULARLY DESCRIBED AS "PARCEL 2" IN QUITCLAIM DEED TO RANCHO VILLA APARTMENTS NO. 2 LLC, RECORDED ON JUNE 24, 2002 AS DOC # 2002–0530243 IN THE OFFICE OF THE COUNTY RECORDED OF SAID COUNTY, LYING NORTHERLY OF THE FOLLOWING DESCRIBED LINE:

COMMENCING AT A CITY OF SAN DIEGO WELL MONUMENT WITH BRASS DISK STAMPED "CITY ENGINEER", SHOWN AS THE NORTHWEST CORNER OF SAID SECTION 32, AND NOTED AS "FP956008" ON RECORD OF SURVEY MAP NO. 16894, FILED ON MARCH 02, 2001 IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY AS FILE NO. 2001–0120527, SAID BRASS DISK BEARS N.00°17'14"E., 785.386 METERS FROM A 2 INCH IRON PIPE WITH TAG STAMPED "RCE 9954", NOTED AS "FP954058" AND SHOWN BY SAID MAP AS THE WEST QUARTER CORNER OF SAID SECTION 32; THENCE S.00°17'14"W., 111.244 METERS TO THE POINT OF BEGINNING; THENCE (1) S.86°18'46"E., 25.827 METERS TO THE BEGINNING OF A NON–TANGENT CURVE, CONCAVE WESTERLY AND HAVING A RADIUS OF 758.638 METERS, TO WHICH A RADIAL LINE BEARS S.86°18'46"E.; THENCE (2) SOUTHERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 01°59'34", AN ARC DISTANCE OF 26.387 METERS; THENCE (3) NON–TANGENT TO SAID CURVE, S.31°04'15"E., 11.604 METERS; THENCE (4) S.68°16'31"E., 51.898 METERS; THENCE (5) S.62°54'47"E., 17.677 METERS; THENCE (6) S.73°59'30"E., 59.446 METERS; THENCE (7) N.87°02'39"E., 58.801 METERS; THENCE (8) S.89°54'53"E., 180.275 METERS; THENCE (9) N.87°32'28"E., 31.130 METERS; THENCE (10) N.85°04'32"E., 103.345 METERS; THENCE (11) N.85°24'13"E., 33.319 METERS; THENCE (12) N.88°24'05"E., 91.342 METERS; THENCE (13) S.88°42'56"E., 89.377 METERS; THENCE (14) N.86°14'06"E., 56.305 METERS; THENCE (15) S.82°36'32"E., 17.400 METERS TO THE EAST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 32, BEING THE POINT OF TERMINUS, SAID TERMINUS LIES DISTANT THEREON S.00°34'17"W., 158.348 METERS FROM A PK NAIL WITH ILLEGIBLY STAMPED TAG NOTED AS "FP956011" AND SHOWN FOR THE NORTH QUARTER CORNER OF SAID SECTION 32 ON SAID RECORD OF SURVEY MAP NO. 16894.

THE BEARINGS AND DISTANCES USED IN THE ABOVE DISCRIPTION ARE BASED ON THE CALIFORNIA COORDINATE SYSTEM OF 1983, ZONE 6, HPGN EPOCH 1991.35. DISTANCES ARE IN METERS UNLESS OTHERWISE NOTED. MULTIPLY DISTANCES BY 0.9999740 TO OBTAIN GROUND LEVEL DISTANCES. TO CONVERT METERS TO US SURVEY FOOT MULTIPLY DISTANCES BY 3937/1200.

GENERAL NOTES

LOT SUMMARY

1. RESIDENTIAL LOTS: 1 TOTAL AREA: 9.20 ACRES
   COMMERCIAL LOTS: 1 TOTAL AREA: 4.50 ACRES
2. TOTAL AREA WITHIN SUBDIVISION IS 14.60 ACRES GROSS
3. GAS AND ELECTRIC: SAN DIEGO GAS AND ELECTRIC
4. TELEPHONE: AT&T
5. CABLE TELEVISION: COX
6. SEWER AND WATER: PRIVATE
7. DRAINAGE SYSTEM: PRIVATE
8. FIRE: PRIVATE
9. SCHOOL DISTRICT: SAN YSIDRO SCHOOL DISTRICT
10. ALL NEW UTILITIES WILL BE LOCATED UNDERGROUND
11. EXISTING TOPOGRAPHY CONTOUR INTERVAL: 1 FEET
    PROJECT DESIGN CONSULTANTS AERIAL PHOTOGRAPHY DATED: 01/17/2018

    DESCRIPTION: CENTERLINE CONTROL MONUMENT
    LOCATION: INTERSECTION OF OTAY MESA ROAD AND HERITATE ROAD
    REFERENCE: CITY OF SAN DIEGO VERTICAL CONTROL RECORD DATED AS OF 1990, INDEX NO. 1469 17701
    ELEVATION: 504.568 FT MSL
    DATUM: NGVD–29
12. ALL PROPOSED SLOPES ARE 2:1 UNLESS NOTED OTHERWISE
13. GRADING SHOWN HEREON IS PRELIMINARY AND IS SUBJECT TO MODIFICATION ON FINAL DESIGN.
14. LOT DIMENSIONS AND SETBACK DIMENSIONS SHOWN HEREON ARE PRELIMINARY AND ARE SUBJECT TO MODIFICATION ON FINAL DESIGN.
15. ALL EXISTING BUILDINGS AND STRUCTURES SHALL BE REMOVED.
16. ALL RESIDENTIAL LOCAL AND PRIVATE STREETS WITH A GRADE BREAK OF 1% OR GREATER, SHALL HAVE VERTICAL CURVES IN ACCORDANCE WITH THE CITY STREET DESIGN MANUAL.
17. ALL PRIVATE ENCROACHMENTS IN THE PUBLIC RIGHT–OF–WAY OR PUBLIC EASEMENT WILL REQUIRE AN ENCROACHMENT MAINTENANCE AND REMOVAL AGREEMENT.
18. ALL PRIVATE ENCROACHMENTS INTO THE PUBLIC RIGHT–OF–WAY OR PUBLIC EASEMENT WILL REQUIRE AN ENCROACHMENT MAINTENANCE AND REMOVAL AGREEMENT.
19. ALL PUBLIC WATER FACILITIES AND ASSOCIATED EASEMENTS WILL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF SAN DIEGO WATER FACILITY DESIGN GUIDELINES AND REGULATIONS, STANDARDS ND PRACTICES PERTAINING THERETO.

ASSESSOR'S PARCEL NUMBER

645–080–16–00

LAMBERT COORDINATES

146–1765

CCS83 COORDINATES

1786–6325

BENCHMARK

DESCRIPTION: CENTERLINE CONTROL MONUMENT
LOCATION: INTERSECTION OF OTAY MESA ROAD AND HERITAGE ROAD
REFERENCE: CITY OF SAN DIEGO VERTICAL CONTROL RECORD DATED AS OF 1990, INDEX NO. 1469 17701
ELEVATION: 504.568 FT. MSL
DATUM: NGVD–29

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM, 1983, ZONE 6, EPOCH 1991.35, GRID BEARING BETWEEN GPS STATION 210 AND GPS STATTION 1465 PER RECORD OF SURVEY MAP NO. 14492.

I.E.: SOUTH 57°37'24" EAST

DISTANCES SHOWN HEREON ARE GRID DISTANCES TO OBTAIN GROUND LEVEL DISTANCES, MULTIPLY DISTANCE BY 1/1.0000252. QOUTED BEARINGS FROM REFERENCE MAPS/DEEDS MAY OR MAY NOT BE IN TERMS OF SAID SYSTEM.

SOLAR ACCESS NOTE

THIS IS TO AFFIRM THAT THE DESIGN OF THIS DEVELOPMENT PROVIDES, TO THE EXTENT FEASIBLE, FOR FUTURE PASSIVE OR NATURAL HEATING AND COOLING OPPORTUNITIES IN ACCORDANCE WITH THE PROVISION OF SECTION 66473.1 OF THE STATE SUBDIVISION MAP ACT.

DEVELOPMENT SUMMARY

1. SUMMARY OF REQUEST:
   A VESTING TENTATIVE MAP NO. 2152396, SITE DEVELOPMENT PERMIT NO. 2152399, MASTER PLANNED DEVELOPMENT PERMIT NO. 2192984, NEIGHBORHOOD DEVELOPMENT PERMIT NO. 2192974, COMMUNITY PLAN AMENDMENT LAND USE NO. 2152393, STREET VACATION NO. 2152395 AND REZONE NO. 2152398 FOR A 171 MULTI–FAMILY RESIDENTIAL CONDOMINIUM PROJECT, A PRIVATE PASSIVE RECREATION PARK AND 45,000 SF OF COMMERCIAL USE. THE MAXIMUM NUMBER OF UNITS THAT CAN BE CONSTRUCTED ON THIS SITE IS 267 MULTI–FAMILY RESIDENTIAL UNITS.
2. STREET ADDRESS: SOUTH EAST CORNER OF CALIENTE AVENUE AND OTAY MESA ROAD
3. SITE AREA
   TOTAL SITE AREA (GROSS): 14.60 ACRES (635,947 SF)
   NET SITE AREA: 13.86 ACRES (603,846 SF)
4. ZONING
   EXISTING: CC–1–3
   PROPOSED: CC–1–3 (LOT 1) AND RM–2–5 (LOT 2)
5. COMMUNITY PLANNING AREA: OTAY MESA
6. COVERAGE DATA
   TOTAL LANDSCAPE / OPEN SPACE AREA: 94,473 SF
   TOTAL HARDSCAPE / PAVED AREA: 183,660 SF
   FLOOR AREA RATIO PER ZONE (FAR): 1.50
   GROSS FLOOR AREA (GFA): 604,644 SF
7. DENSITY
   MAXIMUM DWELLING UNITS ALLOWED PER ZONE: 1 DU/1,500 S.F. OF LOT AREA
   NUMBER OF EXISTING UNITS TO REMAIN ONSITE: 0
   NUMBER OF PROPOSED DWELLING UNITS ONSITE: 171 DU (270 DU MAX)
8. YARD / SETBACK
   REQUIRED:
   MIN. FRONT SETBACK 15 FEET
   STANDARD FRONT SETBACK 20 FEET
   MIN. SIDE SETBACK 5 FEET OR 10% OF PREMISES WIDTH
   MIN. STREET SIDE SETBACK 10 FEET OR 10% OF PREMISES WIDTH
   MIN. REAR SETBACK 15 FEET
   PROPOSED:
   FRONT SETBACK 10 FEET
   SIDE SETBACK 10 FEET
   STREET SIDE SETBACK 10 FEET
   REAR SETBACK 15 FEET
9. MAXIMUM STRUCTURE HEIGHT:
   REQUIRED: 40 FEET
   PROPOSED: 40 FEET

REQUESTED DEVIATIONS

MUNICIPAL CODE REGULATION	SDMC LANGUAGE	REQUIRED	PROPOSED DEVIATION	REQUESTED PERMIT
SECTION 131.0443, TABLE 131–04G	MIN. FRONT SETBACK STD. FRONT SETBACK	15 FEET 20 FEET	MIN. 10 FEET	NDP
SECTION 131.0443, TABLE 131–04G	MIN. SIDEYARD SETBACK	5 FEET OR 10% OF PREMISES WIDTH	MIN. 10 FEET	NDP
SECTION 131.0443, TABLE 131–04G	MIN. STREET SIDE SETBACK	10 FEET OR 10% OF PREMISES WIDTH	MIN. 10 FEET	NDP

SHEET INDEX

PARKING CALCULATIONS

VEHICLE PARKING

REQUIRED AUTOMOBILE SPACES (PER SDMC 142–05C)
PLAN 1 – 3BR 58 DU (6 AFFORDABLE)
PLAN 2 – 3BR 34 DU (3 AFFORDABLE)
PLAN 3 – 4BR 50 DU (6 AFFORDABLE)
PLAN 4 – 4BR 29 DU (3 AFFORDABLE)
TOTAL: 171 DU (18 AFFORDABLE)

171 DU x 2.00 = 342 REQUIRED PARKING SPACES

ACCESSIBLE PARKING SUMMARY (PER SDM–117)
342 x 0.02 = 6.8 ~ 7 ACCESSIBLE PARKING REQUIRED
7 / 6 = 1.17 ~ 2 VAN SPACES REQUIRED
TOTAL ACCESSIBLE PARKING SPACES REQUIRED: 7 ACCESSIBLE SPACES
\+ 2 VAN ACCESSIBLE SPACES
9 ACCESSIBLE SPACES

PROVIDED PARKING SUMMARY
GARAGE SPACES: 342
ACCESSIBLE SPACES: 10
OPEN SPACES: 59 (INCLUDES 7 E.V. AND 6 E.V. CAPABLE)
TOTAL= 411

MOTORCYCLE PARKING:
REQUIRED MOTORCYCLE PARKING (PER SDMC 142–05C)
171 DWELLING UNITS x 0.1 = 18 TOTAL REQUIRED MOTORCYCLE PARKING SPACES

PROVIDED MOTORCYCLE PARKING
20 MOTORCYCLE SPACES

BICYCLE PARKING:
NOT REQUIRED FOR DWELLING UNITS WITH ENCLOSED GARAGES.

GRADING

1. TOTAL AMOUNT OF SITE TO BE GRADED: 13.71 ACRES
2. PERCENTAGE OF TOTAL SITE GRADED: 100 %
3. AMOUNT OF SITE WITH 25 PERCENT SLOPES OR GREATER: 0.38 ACRES
4. PERCENTAGE OF THE EXISTING SLOPES STEEPER THAN 25% PROPOSED TO BE GRADED: 100 %
5. PERCENTAGE OF TOTAL SITE WITH 25 PERCENT SLOPES OR GREATER: 2.6 %
6. AMOUNT OF CUT: 15,100 CUBIC YARDS
7. AMOUNT OF FILL: 43,800 CUBIC YARDS
8. MAXIMUM HEIGHT OF FILL SLOPE(S): 6 FEET
   MAX. 2:1 SLOPE RATIO
9. MAXIMUM HEIGHT OF CUT SLOPE(S): 6 FEET
   MAX. 2:1 SLOPE RATIO
10. AMOUNT OF IMPORT SOIL: 28,700 CUBIC YARDS
11. RETAINING WALLS
    QUANTITY: 1
    MAX. LENGTH: 620 FEET
    MAX. HEIGHT: 7 FEET

NOTE: ADDITIONAL WALLS UNDER 3 FEET IN HEIGHT MAY BE REQUIRED IN RESIDENTIAL PAD AREAS BASED ON FINAL BUILDING PLOTTING.

OWNER / DEVELOPER:

PardeeHomes
13400 SABRE SPRINGS PARKWAY SUITE 200
SAN DIEGO, CA 92128
TEL. (858) 794–2500
FAX (858) 794–2599

JIMMY AYALA DATE
DIVISION PRESIDENT

PREPARED BY:

CIVIL SENSE INC
13475 Danielson Street, Suite 150 | Poway, CA 92064
Office: 858-842-4353

9/21/18
HENRY H. PENG DATE
R.C.E. 63686

REGISTERED PROFESSIONAL ENGINEER
HENRY H. PENG
No. 63686
Exp. 09-30-18
CIVIL
STATE OF CALIFORNIA

NAME: CIVIL SENSE, INC.
ADDRESS: 13475 DANIELON STREET, SUITE 150
POWAY, CA 92128
PHONE: 858–843–4253

PROJECT ADDRESS:
SE CORNER OF OTAY MESA ROAD AND CALIENTE AVENUE

PROJECT NAME:
CALIFORNIA TERRACES - PA61
VTM, SDP, MPDP, NDP, CPA, REZONE AND STREET VACATION

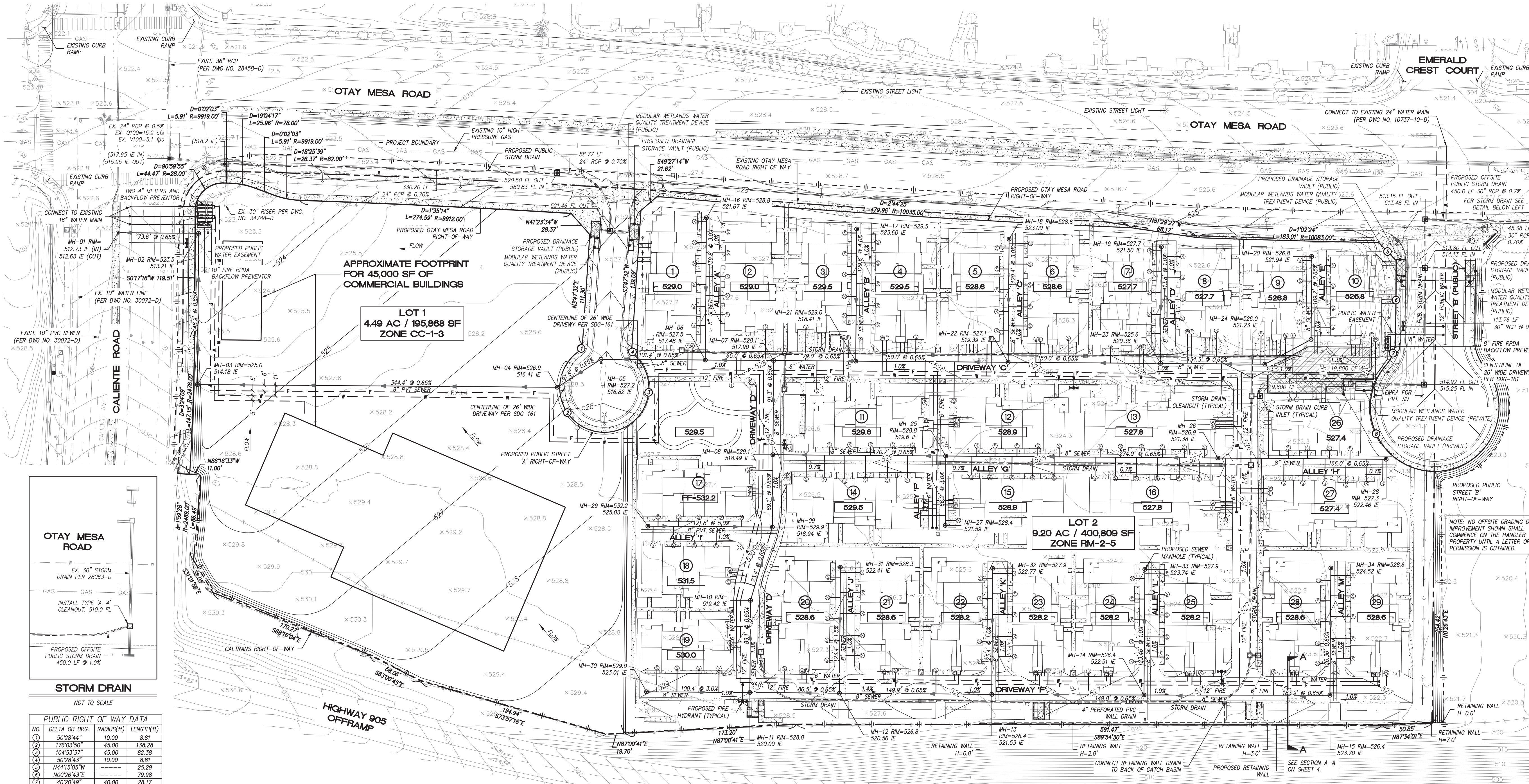
SHEET TITLE:
COVER SHEET

REVISION 12:
REVISION 11:
REVISION 10:
REVISION 9:
REVISION 8:
REVISION 7:
REVISION 6:
REVISION 5:
REVISION 4:
REVISION 3:
REVISION 2: 09/19/18
REVISION 1: 07/13/18

ORIGINAL DATE: 04/16/18

SHEET 1 OF 13

DEP #



STORM DRAIN

NOT TO SCALE

PUBLIC RIGHT OF WAY DATA			
NO.	DELTA OR BRG.	RADIUS(ft)	LENGTH(ft)
1	50°28'44"	10.00	8.81
2	176°03'50"	45.00	138.28
3	104°53'37"	45.00	82.38
4	50°28'43"	10.00	8.81
5	N44°15'05"W	------	25.29
6	N00°26'43"E	------	79.98
7	40°20'49"	40.00	28.17
8	130°19'32"	65.00	147.85

LEGEND

VTM BOUNDARY

PROPOSED PRIVATE WATER MAIN (SIZE PER PLAN)
CITY OF SAN DIEGO SDW-110, SDW-148, SDW-157

PROPOSED PRIVATE FIRE MAIN (SIZE PER PLAN)
PER NFPA PAMPHLET 24 (2016 EDITION)

PROPOSED PRIVATE WATER SERVICE
CALIFORNIA PLUMBING CODE

PROPOSED PRIVATE FIRE SERVICE
PER NFPA PAMPHLET 24 (2016 EDITION)

PROPOSED FIRE REDUCE PRESSURE DETECTOR ASSEMBLY
CITY OF SAN DIEGO SDW-120

PROPOSED DUAL WATER METERS AND BACK FLOW DEVICE
CITY OF SAN DIEGO SDW-119

PROPOSED PRIVATE SEWER AND SEWER MANHOLE
(SIZE PER PLAN) CALIFORNIA PLUMBING CODE

PROPOSED SEWER FLOW (SLOPE PER PLAN)

PROPOSED PRIVATE SEWER LATERAL
CALIFORNIA PLUMBING CODE

PROPOSED PRIVATE IRRIGATION SERVICE, METER,
AND BACKFLOW PREVENTION DEVICE.

NOTE: ALL SEWER, WATER, AND STORM DRAIN UTILITIES ARE PRIVATE UNLESS OTHERWISE NOTED.

PROPOSED STORM DRAIN
(PRIVATE UNLESS OTHERWISE NOTED)
CITY OF SAN DIEGO D-61 AND SDD-110

PROPOSE STORM DRAIN GRATED INLET (TYPE-I)
(PRIVATE UNLESS OTHERWISE NOTED)
CITY OF SAN DIEGO SDD-114, D-15, AND D-29

PROPOSED STORM DRAIN CURB INET (TYPE-B)
(PRIVATE UNLESS OTHERWISE NOTED)
CITY OF SAN DIEGO SDD-114 AND SDD-116

PROPOSED STORM DRAIN CLEAN OUT (TYPE A-4)
(PRIVATE UNLESS OTHERWISE NOTED)
CITY OF SAN DIEGO SDD-114 AND D-09

PROPOSED FIRE HYDRANT
CITY OF SAN DIEGO SDW-104, SDW-148, AND SDW-151

1 BUILDING NUMBER

528.6 PAD ELEVATION

530 PROPOSED CONTOURS

PROPOSED RETAINING WALL

PROPOSED DAYLIGHT LINE / LIMIT OF WORK

PROPOSED STREET LIGHT
130w LED PER CALTRANS TYPE 16 POLE

1.0% SURFACE FLOW DIRECTION
AND SLOPE GRADIENT

MINIMUM TREE SEPARATION DISTANCE

IMPROVEMENT	MIN. DISTANCE TO STREET TREE
TRAFFIC SIGNAL, STOP SIGN	20 FEET
UNDERGROUND UTILITY LINES (EXCEPT SEWER)	5 FEET
SEWER LINES	10 FEET
ABOVE GROUND UTILITY STRUCTURES (TRANSFORMERS, HYDRANTS, UTILITY POLES, ETC)	10 FEET
DRIVEWAYS	10 FEET *
INTERSECTIONS (INTERSECTING CURB LINES OF TWO STREETS)	25 FEET

* 5 FEET ON RESIDENTIAL LOCAL STREETS WITH A DESIGN SPEED OF 25MPH OR SLOWER

UTILITY TABLE

UTILITY	OVERHEAD/UNDERGROUND
GAS	UNDERGROUND
ELECTRIC	UNDERGROUND
TELEPHONE (AT&T)	UNDERGROUND
CABLE TELEVISION (COX)	UNDERGROUND
SEWER	UNDERGROUND
STORM DRAIN	UNDERGROUND
FIRE	UNDERGROUND
WATER	UNDERGROUND

NOTE: THE SUBDIVIDER SHALL ENSURE THAT ALL ONSITE UTILITIES SERVING THE SUBDIVISION SHALL BE UNDERGROUNDED WITH ALL OF THE APPROPRIATE PERMITS.

UTILITY NOTES

1. NO TREES OR SHRUBS EXCEEDING THREE FEET IN HEIGHT AT MATURITY SHALL BE INSTALLED WITHIN TEN FEET OF ANY SEWER AND FIVE FEET OF ANY WATER FACILITIES.
2. MINIMUM 10 FOOT SEPARATION FROM SEWER MAINS TO WATER MAINS. 10 FOOT SEPARATION TO BE MEASURED FROM OUTSIDE EDGE OF PIPE TO OUTSIDE EDGE OF PIPE.
3. ALL WATER SERVICES TO THE SITE, INCLUDING DOMESTIC, IRRIGATION AND FIRE, WILL REQUIRE PRIVATE, ABOVE GROUND BACK FLOW PREVENTION DEVICES (BFPDS). BFPDS ARE TYPICALLY LOCATED ON PRIVATE PROPERTY, IN LINE WITH THE SERVICE AND IMMEDIATELY ADJACENT TO THE RIGHT-OF-WAY. THE PUBLIC UTILITIES DEPARTMENT WILL NOT PERMIT THE REQUIRED BFPDS TO BE LOCATED BELOW GRADE OR WITHIN THE STRUCTURE.
4. IF A 3" OR LARGER METER IS REQUIRED FOR THIS PROJECT, THE OWNER/PERMITTEE SHALL CONSTRUCT THE NEW METER AND PRIVATE BACKFLOW DEVICE ON SITE, ABOVE GROUND, WITHIN AN ADEQUATELY SIZED WATER EASEMENT, IN A MANNER SATISFACTORY TO THE PUBLIC UTILITIES DIRECTOR AND THE CITY ENGINEER.
5. PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS, THE OWNER/PERMITTEE SHALL OBTAIN AN ENCROACHMENT MAINTENANCE REMOVAL AGREEMENT, FROM THE CITY ENGINEER, FOR THE PRIVATE SEWER LATERAL IN THE STREET A RIGHT-OF-WAY.

0 20 40 80 120
(IN FEET)
1 inch = 40 ft.

PREPARED BY:

CIVIL SENSE INC
13475 Danielson Street, Suite 150 | Poway, CA 92064
Office: 858-842-4353

HENRY H. PENG 9/21/18
R.C.E. 63686 DATE

REGISTERED PROFESSIONAL ENGINEER
HENRY H. PENG
No. 63686
Exp. 09-30-18
CIVIL
STATE OF CALIFORNIA

GRADING NOTES / BMP NOTES

1. BMP MAINTENANCE – PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL ENTER INTO A MAINTENANCE AGREEMENT FOR THE ONGOING PERMANENT BMP MAINTENANCE, SATISFACTORY TO THE CITY ENGINEER.
2. CONSTRUCTION BMP – PRIOR TO ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION1 (GRADING REGULATIONS) OR SAN DIEGO MUNICIPAL CODE, INTO THE CONSTRUCTION PLANS OR SPECIFICATIONS.

NAME: CIVIL SENSE, INC.
ADDRESS: 13475 DANIELON STREET, SUITE 150
POWAY, CA 92128
PHONE: 858-843-4253

PROJECT ADDRESS:
SE CORNER OF OTAY MESA
ROAD AND CALIENTE AVENUE

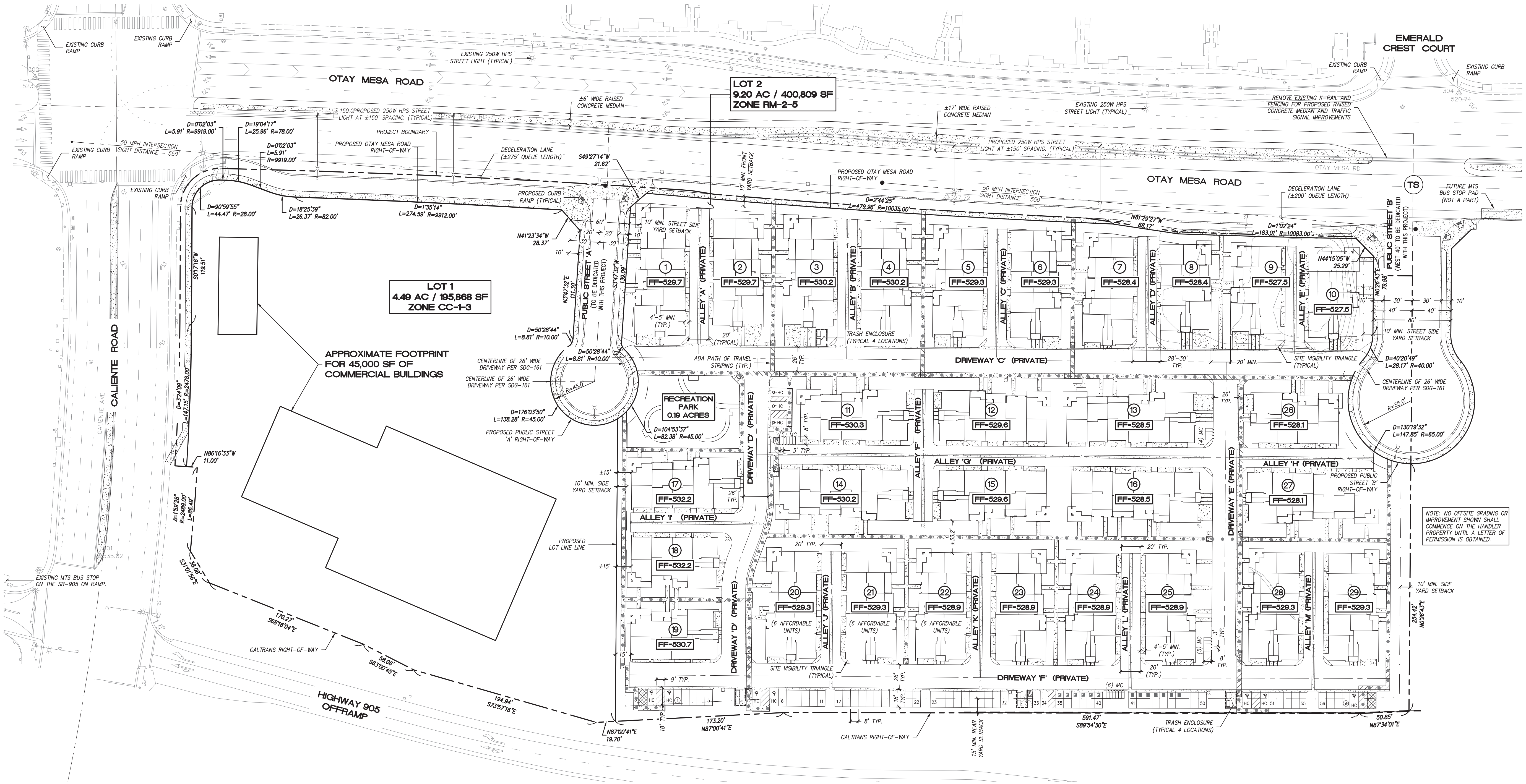
PROJECT NAME:
CALIFORNIA TERRACES - PA61
VTM, SDP, MPDP, NDP, CPA, REZONE
AND STREET VACATION

SHEET TITLE:
GRADING AND UTILITY PLAN

REVISION 12:	
REVISION 11:	
REVISION 10:	
REVISION 9:	
REVISION 8:	
REVISION 7:	
REVISION 6:	
REVISION 5:	
REVISION 4:	
REVISION 3:	
REVISION 2:	09/19/18
REVISION 1:	07/13/18
ORIGINAL DATE:	04/16/18

SHEET 5 OF 13

DEP #

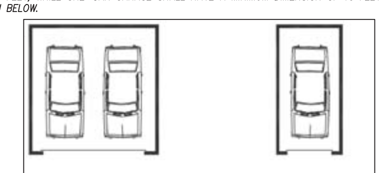


LEGEND

	VTM BOUNDARY
1	BUILDING NUMBER
FF-530.7	PROPOSED FINISHED FLOOR ELEVATION
	PROPOSED ON-SITE LOW LEVEL PEDESTRIAN STREET LIGHT CITY OF SAN DIEGO SDE-101
	PROPOSED STREET LIGHT CITY OF SAN DIEGO SDE-101
	PROPOSED CURB / CURB AND GUTTER CITY OF SAN DIEGO SDG-151
	PROPOSED CONCRETE MID-BLOCK CROSS GUTTER CITY OF SAN DIEGO SDG-158
	PROPOSED CONCRETE CROSS GUTTER CITY OF SAN DIEGO SDG-157
	PROPOSED SIDEWALK CITY OF SAN DIEGO SDG-109 AND SDG-155
TS	PROPOSED TRAFFIC SIGNAL (BY OTHERS)
VISIBILITY TRIANGLE	VISIBILITY TRIANGLE. NO OBSTRUCTION INCLUDING LANDSCAPING OR SOLID WALLS IN THE VISIBILITY AREA SHALL EXCEED 24 INCHES IN HEIGHT.
	PROPOSED ACCESSIBLE CROSSING
	PROPOSED ACCESSIBLE PATH OF TRAVEL
	PROPOSED DRIVEWAY APRON CITY OF SAN DIEGO SDG-160 AND SDG-161
CURB	PROPOSED PEDESTRIAN RAMP AND TRUNCATED DOMES CITY OF SAN DIEGO SDG-130 AND SDG-132
8' TYP. 3' TYP.	MOTORCYCLE PARKING STALL (21 TOTAL)
18' TYP. 8' TYP.	PARKING STALL (59 NON-ADA STALLS)
9' TYP. 9' TYP. 18' TYP.	PARKING ADA STALL AND LOADING AREA (10 ADA STALLS)
9' TYP. 18' TYP.	TURN AROUND SPACES – NO PARKING (TYPICAL 2 LOCATIONS)
9' TYP. 18' TYP.	ELECTRICAL VEHICLE (E.V.) CAPABLE PARKING SPACES (6 STALLS)
9' TYP. 18' TYP.	ELECTRICAL VEHICLE (E.V.) PARKING SPACES (6 STALLS)

TYPICAL GARAGE SPACE DETAIL

CITY OF SAN DIEGO STANDARDS, ALL TWO-CAR GARAGES SHALL HAVE A MINIMUM DIMENSION OF 20 FEET X 20 FEET, WHILE ONE-CAR GARAGE SHALL HAVE A MINIMUM DIMENSION OF 10 FEET X 20 FEET, AS SHOWN BELOW.



2-CAR GARAGE MIN. 20'X20'

1-CAR GARAGE MIN. 10'X20'

GENERAL NOTES

1. EMRA – ENCROACHMENT MAINTENANCE REMOVAL AGREEMENT (EMRA) SHALL BE REQUIRED FOR ALL PRIVATE IMPROVEMENTS INCLUDING BUT NOT LIMITED TO UTILITIES, LANDSCAPE, IRRIGATION, AND OTHER MISCELLANEOUS STRUCTURES WITH IN THE PUBLIC RIGHT-OF-WAY IF DEEMED ALLOWABLE BY THE CITY ENGINEER.
2. VISIBILITY AREA – NO OBSTRUCTION INCLUDING SOLID WALLS IN THE VISIBILITY AREA SHALL EXCEED 3 FEET IN HEIGHT. PLANT MATERIAL, OTHER THAN TREES, WITHIN THE PUBLIC RIGHT-OF-WAY THAT IS LOCATED WITHIN VISIBILITY AREAS SHALL NOT EXCEED 24 INCHES IN HEIGHT, MEASURED FROM THE TOP OF THE ADJACENT CURB.

0 20 40 80 120

(IN FEET)
1 inch = 40 ft.

PREPARED BY:

CIVIL SENSE INC
13475 Danielson Street, Suite 150 | Poway, CA 92064
Office: 858-842-4253

HENRY H. PENG
R.C.E. 63686

9/21/18
DATE

REGISTERED PROFESSIONAL ENGINEER HENRY H. PENG No. 63686 Exp. 06-30-18 CIVIL STATE OF CALIFORNIA

NAME: CIVIL SENSE, INC.
ADDRESS: 13475 DANIELSON STREET, SUITE 150
POWAY, CA 92128
PHONE: 858-843-4253

PROJECT ADDRESS:
SE CORNER OF OTAY MESA ROAD AND CALIENTE AVENUE

PROJECT NAME:
CALIFORNIA TERRACES - PA61
VTM, SDP, MPDP, NDP, CPA, REZONE AND STREET VACATION

SHEET TITLE:
SITE PLAN

REVISION 12:	
REVISION 11:	
REVISION 10:	
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REVISION 7:	
REVISION 6:	
REVISION 5:	
REVISION 4:	
REVISION 3:	
REVISION 2:	09/19/18
REVISION 1:	07/13/18
ORIGINAL DATE:	04/16/18

SHEET 6 OF 13

DEP #

Attachment 5
Drainage Report

Attach project's drainage report. Refer to Drainage Design Manual to determine the reporting requirements.

PRELIMINARY DRAINAGE REPORT
FOR
CALIFORNIA TERRACES – PA61

September 19, 2018

Wayne W. Chang, MS, PE 46548

Chang Consultants

Civil Engineering ◦ Hydrology ◦ Hydraulics ◦ Sedimentation

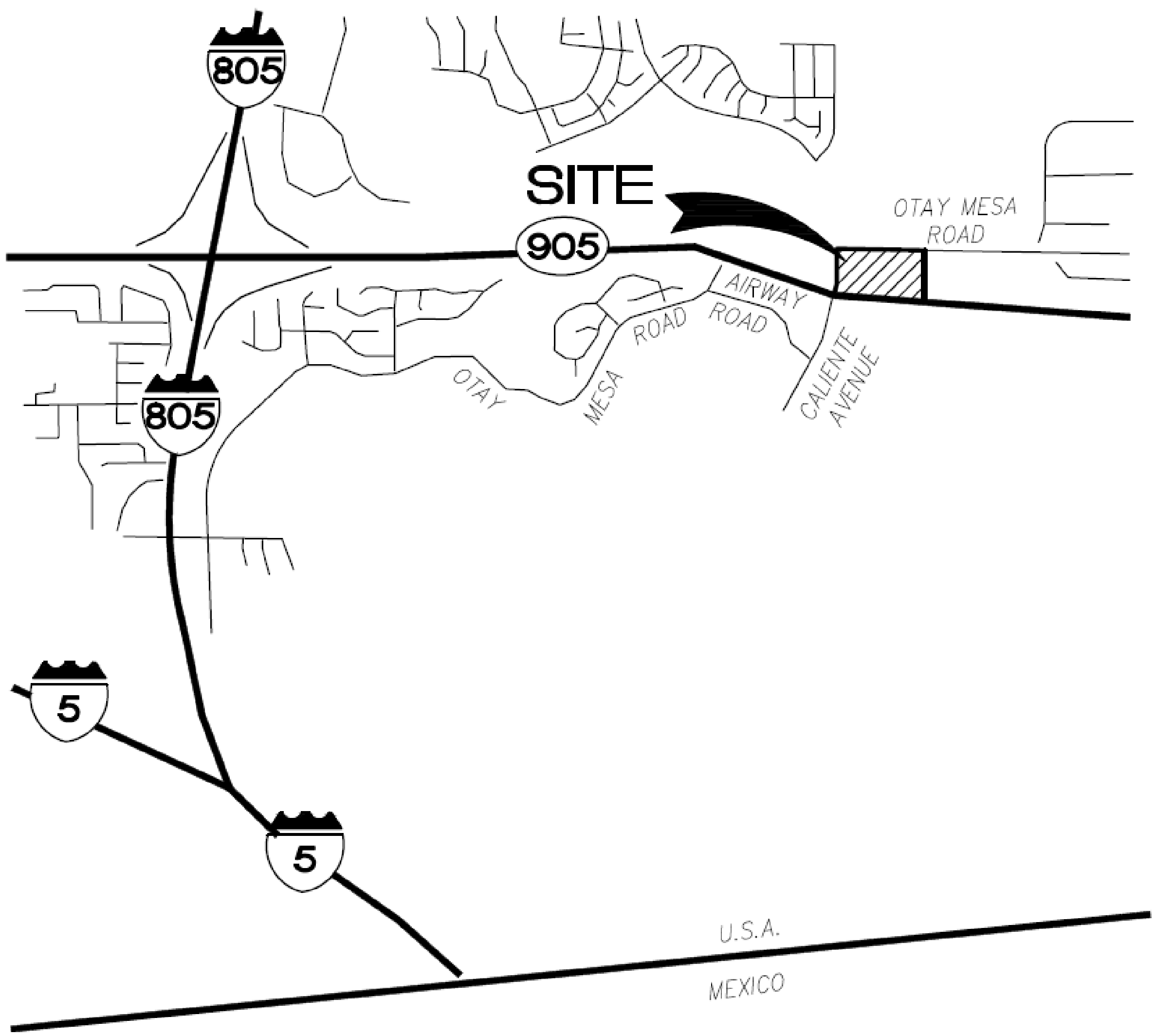
P.O. Box 9496
Rancho Santa Fe, CA 92067
(858) 692-0760

FOR REVIEW ONLY

-TABLE OF CONTENTS -

INTRODUCTION

Pardee Homes is proposing to develop a 14.50-acre site located southeast of the intersection of Otay Mesa Road and Caliente Avenue in the city of San Diego (see the Vicinity Map). The site is currently undeveloped and supports low lying vegetation consisting of brush and grasses. The project proposes 171 multi-family units including 18 affordable and a private recreation park on the easterly two-thirds of the site (Lot 2). The residential development regulations permit up to 270 multi-family residential units on Lot 2, so the proposed density is lower than allowed. For this residential development area, there are two proposed public streets off of Otay Mesa Road that provide access to the east (Street B) and west (Street A) ends of the project, as well as private on-site driveways, alleys, and parking. The westerly third of the site (Lot 1) will be mass-graded and developed with up to 45,000 square feet of commercial uses in the future under a separate Planned Development Permit and Site Development Permit. The project's preliminary plans are being designed by Civil Sense, Inc.



Vicinity Map

Under existing, pre-project conditions, storm runoff from the site sheet flows over the gently sloping, natural ground surface. The majority of the sheet flow is directed to the east and onto the adjacent parcel. The on- and off-site runoff continues easterly as sheet flow towards a small watercourse approximately 1,400 feet east of the site. There is a historic pond that was graded within the northeast corner of the site that captures precipitation within its footprint. The remaining site runoff is directed towards the northwest corner of the site (towards the intersection of Otay Mesa Road and Caliente Avenue) and into an existing storm drain system. There are no other existing on-site drainage facilities and there is minimal off-site run-on.

Under proposed, post-project conditions, storm runoff will be conveyed by the private alleys and driveways to on-site storm drain systems. The majority of the runoff will be conveyed towards the northeast corner of the site where the proposed on-site storm drain will connect to an existing storm drain in Otay Mesa Road about 500 feet east of the site. The existing storm drain outlets into a natural watercourse within Dennery Canyon on the north site of Otay Mesa Road. The watercourse continues north to the Otay River, which flows into San Diego Bay. Storm runoff from the multi-family development area will be private and conveyed in private drainage facilities. Storm runoff from the easterly proposed public street and cul-de-sac will be conveyed in public drainage facilities. The private and public runoff will not commingle until leaving the site.

Post-project storm runoff from the northwest corner of project will be from the westerly proposed public street and cul-de-sac. This runoff will be conveyed by the proposed street and public storm drain system to an existing storm drain system at the intersection of Caliente Avenue and Otay Mesa Road. Storm runoff from the westerly mass-graded pad will also enter this storm drain system. The existing storm drain system crosses Otay Mesa Road and continues north along Ocean View Hills Parkway (Ocean View Hills Parkway is named Caliente Avenue south of Otay Mesa Road) before outletting into a natural watercourse within Dennery Canyon. As mentioned above, this watercourse continues to the Otay River, which flows into San Diego Bay.

This preliminary drainage report has been prepared in support of Civil Sense, Inc's entitlement plans and calculates tentative-map level runoff from the site. In addition, normal depth analyses have been prepared for the proposed public storm drains that convey storm runoff from the site.

HYDROLOGIC RESULTS

The overall site covers 16.37 acres so the City of San Diego's 2017, *Drainage Design Manual's* (Manual) rational method procedure was the basis for the existing and proposed condition hydrologic analyses. The Manual states that "the combination of storm drain system capacity and overflow" shall be able to carry the 100-year, while "the underground storm drain system shall be based upon a 50-year frequency storm." Both 50- and 100-year are provided. During final engineering when the storm drain system has been fully designed, detailed 50-year hydraulic modeling for the public storm drains will be performed. At the current entitlement stage normal depth analyses have been performed to determine preliminary storm drain sizing.

The public storm drain facilities include the curb inlets in Street A and in Street B (two in each street) and downstream facilities. The curb inlets will be integrated into Modular Wetland System Linear BMPs. The internal storm drains upstream of the curb inlets will be private.

The rational method input parameters are summarized below, and the supporting data is included in Appendix A:

- Intensity-Duration-Frequency: The City's 50- and 100-year Intensity-Duration-Frequency curve from the *Drainage Design Manual* was used.

- Drainage area: The drainage areas are shown on the Existing and Proposed Condition Rational Method Work Maps in Appendix A. The overall existing and proposed condition drainage areas were set equal to allow a comparison of results.

- Hydrologic soil groups: The soil group within the site is entirely 'D' according to the City criteria.

- Runoff coefficients: Under existing conditions, the study area is pervious except for Otay Mesa Road. The roughness coefficient (C=0.45) was based on the rural land use category. Under proposed conditions, the condominium development was assigned a multi-unit land use (C=0.70) while the mass-graded pad was assigned the rural land use.

The existing and proposed condition rational method analyses are contained in Appendix A and summarized in Table 1. The results indicate the project will increase the 100-year flow rates. The flows to the east will be conveyed in existing (PDC determined that the existing receiving storm drain crossing Otay Mesa Road has capacity for 44 cfs) and proposed storm drain facilities with capacity for the tributary flow rate. These facilities will outlet directly into the Dennery Canyon watercourse, which flows to the Otay River and then San Diego Bay. Since the easterly flows can adequately be conveyed by the receiving drainage facilities and the outflow is then conveyed to San Diego Bay by natural watercourses, detention is not required for the easterly flows. On the other hand, the easterly flows will be detained by proposed underground flow-control vaults along Street A, as needed.

Drainage Basin	**Drainage Area, ac**		**100-Year Flow, cfs**	
	Existing	Proposed	Existing	Proposed
Easterly	11.66	9.42	12	21
Westerly	3.19	5.43	4.3	8.4

Table 1. Comparison of Rational Method Results

An August 7, 1987 Notice from the City of San Diego provides drainage requirements for Otay Mesa development projects within the watershed that drains into Mexico (see attachment after this report text). The associated watershed was defined by an April 2007, *Drainage Study for the Otay Mesa Community Plan Update*, by Kimley-Horn and Associates, Inc. The 2007 study shows the site within the watershed tributary to Mexico. However, the watershed has been altered by the construction of Interstate 905 and no longer encompasses the site. The Notice specifies that detention facilities shall be designed for the 5-, 10-, 25-, and 50-year storms. As indicated in this drainage report, all of the PA-61 project runoff flows north into Dennery Canyon, the Otay River, and then San Diego Bay. Therefore, the Notice and associated detention requirements are not applicable to the project.

HYDRAULIC RESULTS

Normal depth analyses have been prepared for preliminary sizing of the proposed public storm drain facilities that convey runoff away from the site. The westerly storm drain system consists of two public laterals between rational method nodes 20 and 22 as well as nodes 20 and 24. The 50-year flow rate at each lateral is the same and is 0.4 cfs. The normal depth results are included in Appendix B and show that an 18-inch RCP at a 1 percent slope can convey the flows at a 0.2 foot depth. The laterals connect to the storm drain serving the project site, and the combined flow is conveyed in a public storm drain system that continues east along Otay Mesa Road. The 50-year flow rate in the Otay Mesa Road storm drain is 19 cfs. Civil Sense, Inc. determined that the pipe will be at a 0.7 percent slope. The normal depth results based on this flow rate and slope shows that a 24-inch RCP can convey the 50-year flow rate at a depth of 1.65 feet. This flow rate enters an existing storm drain with capacity for 44 cfs, so the existing and proposed public storm drains serving the project have adequate capacity for the 50-year flow rate. Dennery Canyon, the Otay River, and San Diego Bay are below the storm drain systems. These natural conveyances can convey the project runoff.

The easterly storm drain system consists of two public laterals between rational method nodes 32 and 34 as well as nodes 34 and 24. The 50-year flow rate at each lateral is the same and is 0.4 cfs. The normal depth results are included in Appendix B and show that an 18-inch RCP at a 1 percent slope can convey the flows at a 0.2 foot depth. The laterals connect to a public storm drain system that continues west along Otay Mesa Road. The 50-year flow rate in the Otay Mesa Road storm drain is 0.8 cfs. Civil Sense, Inc. determined that the pipe will be at a 0.7 percent slope. The normal depth results based on this flow rate and slope shows that an 18-inch RCP can convey the 50-year flow rate at a depth of 0.31 feet. Detention will be provided so that the easterly flows do not increase. Therefore, the existing storm drain capacity will not be impacted.

CONCLUSION

The analyses in this drainage report show that the project will increase the 100-year flow rate, which is anticipated since the undeveloped site will be partially developed with condominiums. Detention is not required for the easterly flows because the existing and proposed downstream drainage facilities have adequate capacity. Detention will be designed for the westerly flows as needed, during final engineering. The detention will prevent impacts to the existing westerly drainage facilities.

Hydraulic analyses show that the proposed public storm drain pipes needed to convey the project runoff will range from 18- to 24-inch.

The project is just north of Interstate 905. Storm runoff from the site is generally directed to the north. Therefore, the project's runoff will not enter the Caltrans right-of-way and will not impact Caltrans' adjacent drainage facilities.

There are no waters of the US at or in the immediate vicinity of the site. Therefore, neither a Federal Clean Water Act Section 401 (Regional Water Quality Control Board) nor 404 permit (US Army Corps of Engineers) are required. The project will cause no negative impacts to developability of adjacent properties since the outflow will be into storm drain facilities or natural watercourses.

Reproduction of 1987 NOTICE from Engineering and Development Department

NOTICE

Date: August 7, 1987

To: All Private Engineers

From: Subdivision Engineer

Subject: Drainage requirements for development in Otay Mesa

In order to minimize the effects of increased storm water runoff in Mexico, due to development of property in Otay Mesa, all property in Otay Mesa that is within the water shed that drains into Mexico, shall be developed with the following requirements:

Project does not drain to Mexico. It drains to San Diego Bay.

1. Each property owner shall provide storm water detention facilities so that there will be no increase in the rate of runoff due to development of the property.

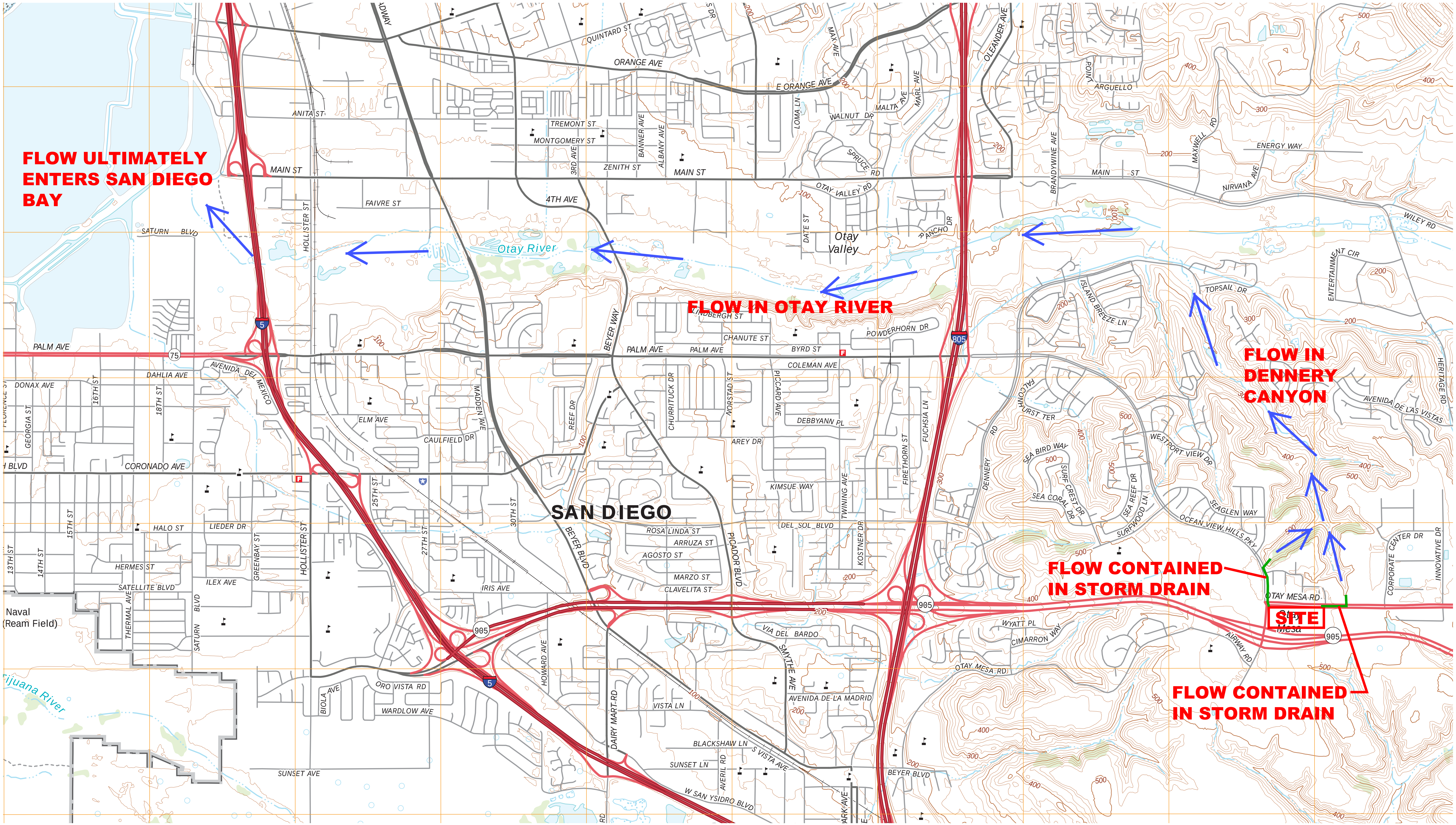
2. The detention facilities shall be designed so that the rate of runoff from the property will not be greater after development than it was before development for a 5 year, 10 year, 25 year and 50 year storm.

3. All drainage facilities crossing four-lane major or higher classification streets shall be designed for a Q100 (existing). Other facilities, except the major channel referred to in paragraph 5, may be designed for Q50 (existing).

4. The Drainage Design Manual shall be used as guidelines for design of drainage facilities and computing design discharges.

5. The City Engineer's Office, Flood Control Section, is preparing a preliminary plan for the main north-south channel from Otay Mesa Road near La Media to the Mexican Border. The preliminary design will include the design "Q" (Q100 existing), the invert grade, and the water surface elevation at the major road crossings.

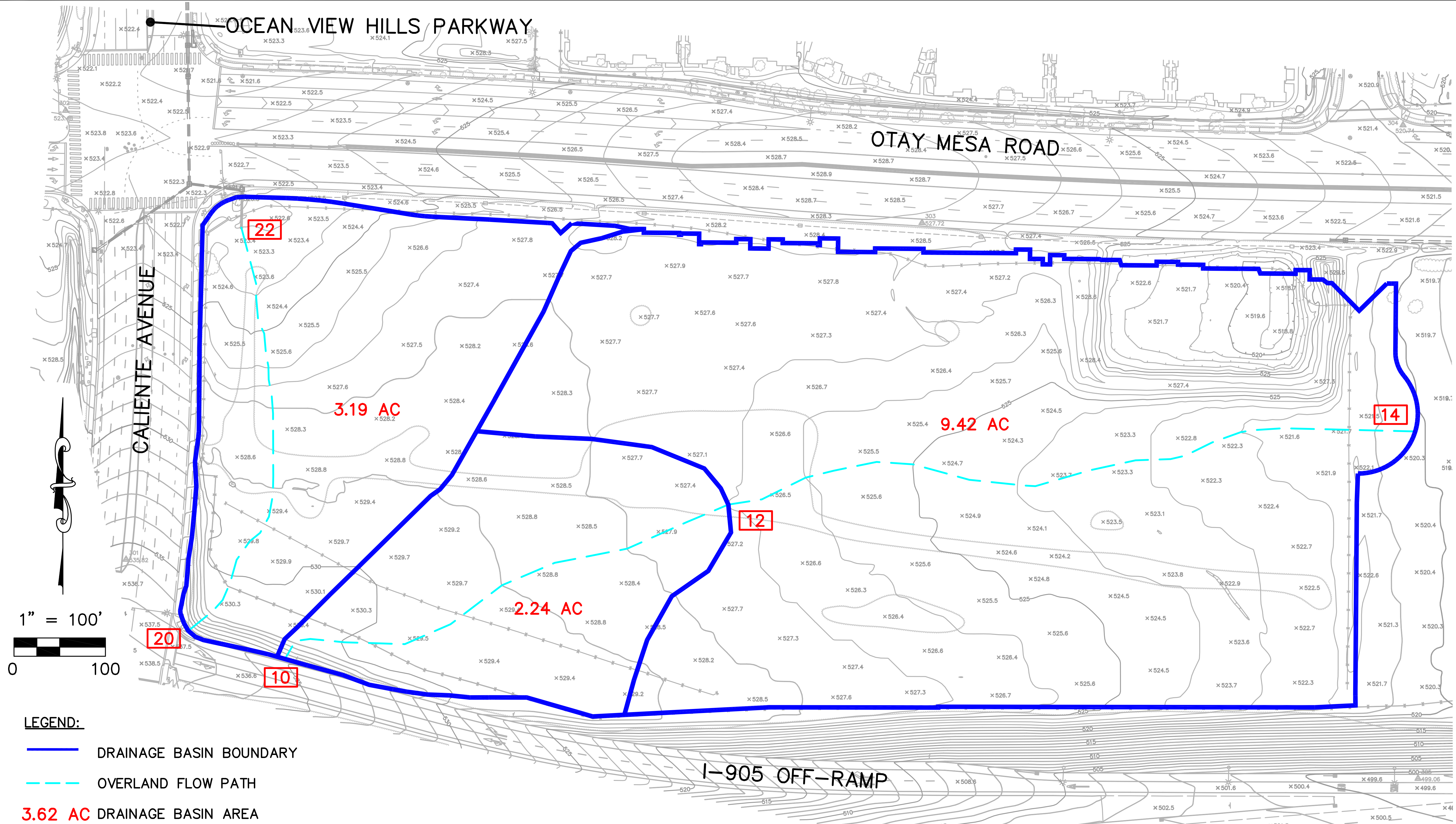
C.R. Lockhead
Subdivision Engineer



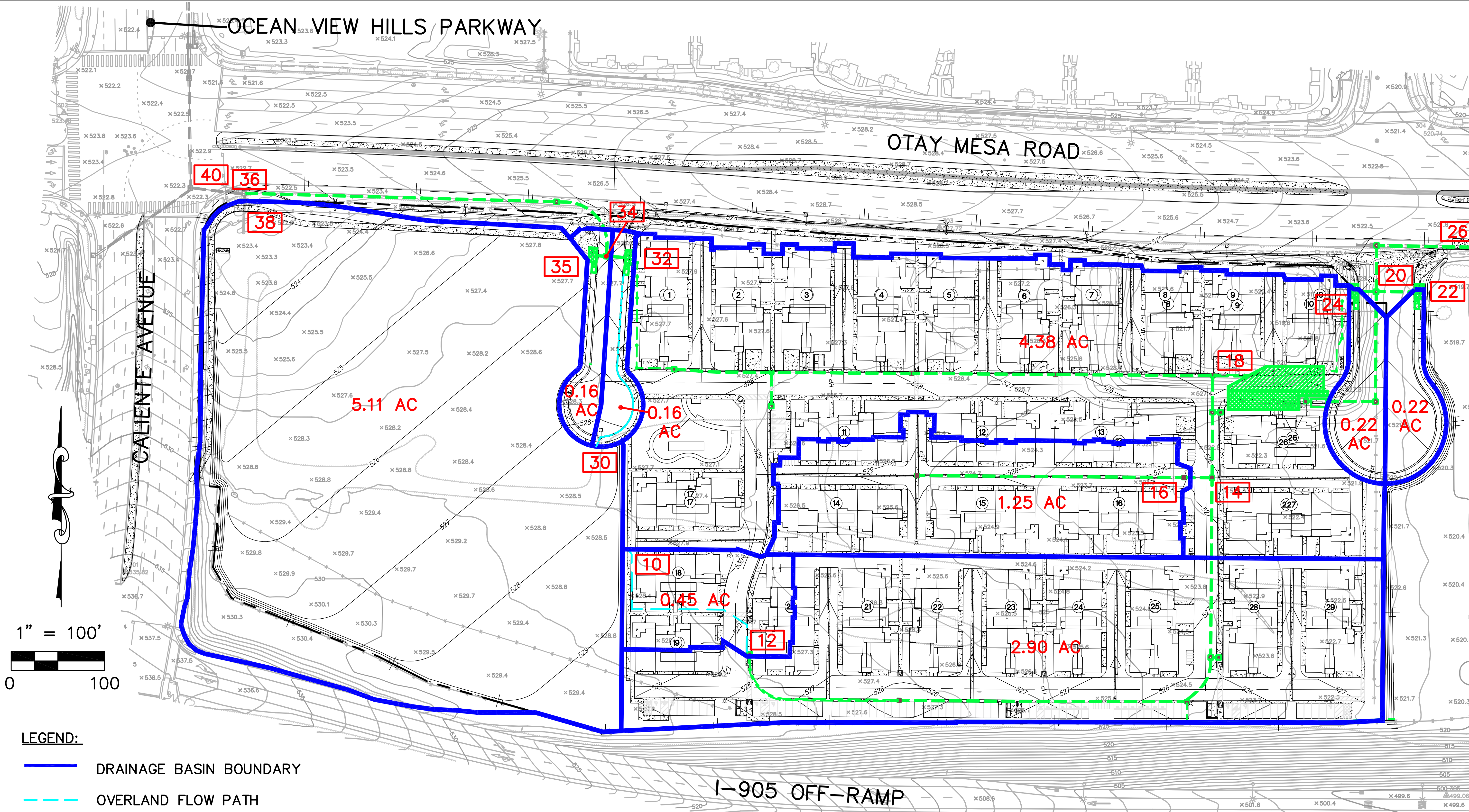
FLOW PATHS FROM PA-61 TO SAN DIEGO BAY

APPENDIX A

RATIONAL METHOD ANALYSES
AND BACKUP DATA



EXISTING CONDITION
RATIONAL METHOD WORK MAP



LEGEND:

(blue line)	DRAINAGE BASIN BOUNDARY
(cyan dashed line)	OVERLAND FLOW PATH
(green line)	PROPOSED DRAINAGE FACILITY
3.62 AC	DRAINAGE BASIN AREA
10	RATIONAL METHOD NODE NUMBER

PROPOSED CONDITION
RATIONAL METHOD WORK MAP

NOTES:
THE PROPOSED CURB INLETS (MODULAR WETLAND CURB INLETS) AT NODES 22, 24, 32, AND 35 AS WELL AS THE DOWNSTREAM DRAINAGE FACILITIES WILL BE PUBLIC. THE REMAINING ON-SITE FACILITIES WILL BE PRIVATE.

Table A-1. Runoff Coefficients for Rational Method

Land Use	Runoff Coefficient (C) Soil Type [1]
Residential:	
Single Family	0.55
Multi-Units	0.70
Mobile Homes	0.65
Rural (lots greater than ½ acre)	0.45
Commercial [2]	
80% Impervious	0.85
Industrial [2]	
90% Impervious	0.95

Note:
[1] Type D soil to be used for all areas.
[2] Where actual conditions deviate significantly from the tabulated imperviousness values of 80% or 90%, the values given for coefficient C, may be revised by multiplying 80% or 90% by the ratio of actual imperviousness to the tabulated imperviousness. However, in case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness			=	50%
Tabulated imperviousness			=	80%
Revised C	=	(50/80) x 0.85	=	0.53

The values in Table A–1 are typical for urban areas. However, if the basin contains rural or agricultural land use, parks, golf courses, or other types of nonurban land use that are expected to be permanent, the appropriate value should be selected based upon the soil and cover and approved by the City.

A.1.3. Rainfall Intensity

The rainfall intensity (I) is the rainfall in inches per hour (in/hr.) for a duration equal to the T_C for a selected storm frequency. Once a particular storm frequency has been selected for design and a T_C calculated for the drainage area, the rainfall intensity can be determined from the Intensity-Duration-Frequency Design Chart (Figure A-1).

ELEV.	FACTOR
0-1500	1.00
1500-3000	1.25
3000-4000	1.42
4000-5000	1.60
5000-6000	1.7
DESERT	1.25

TO OBTAIN CORRECT INTENSITY, MULTIPLY INTENSITY ON CHART BY FACTOR FOR DESIGN ELEVATION.

RAINFALL
INTENSITY - DURATION - FREQUENCY
CURVES
FOR
COUNTY OF SAN DIEGO

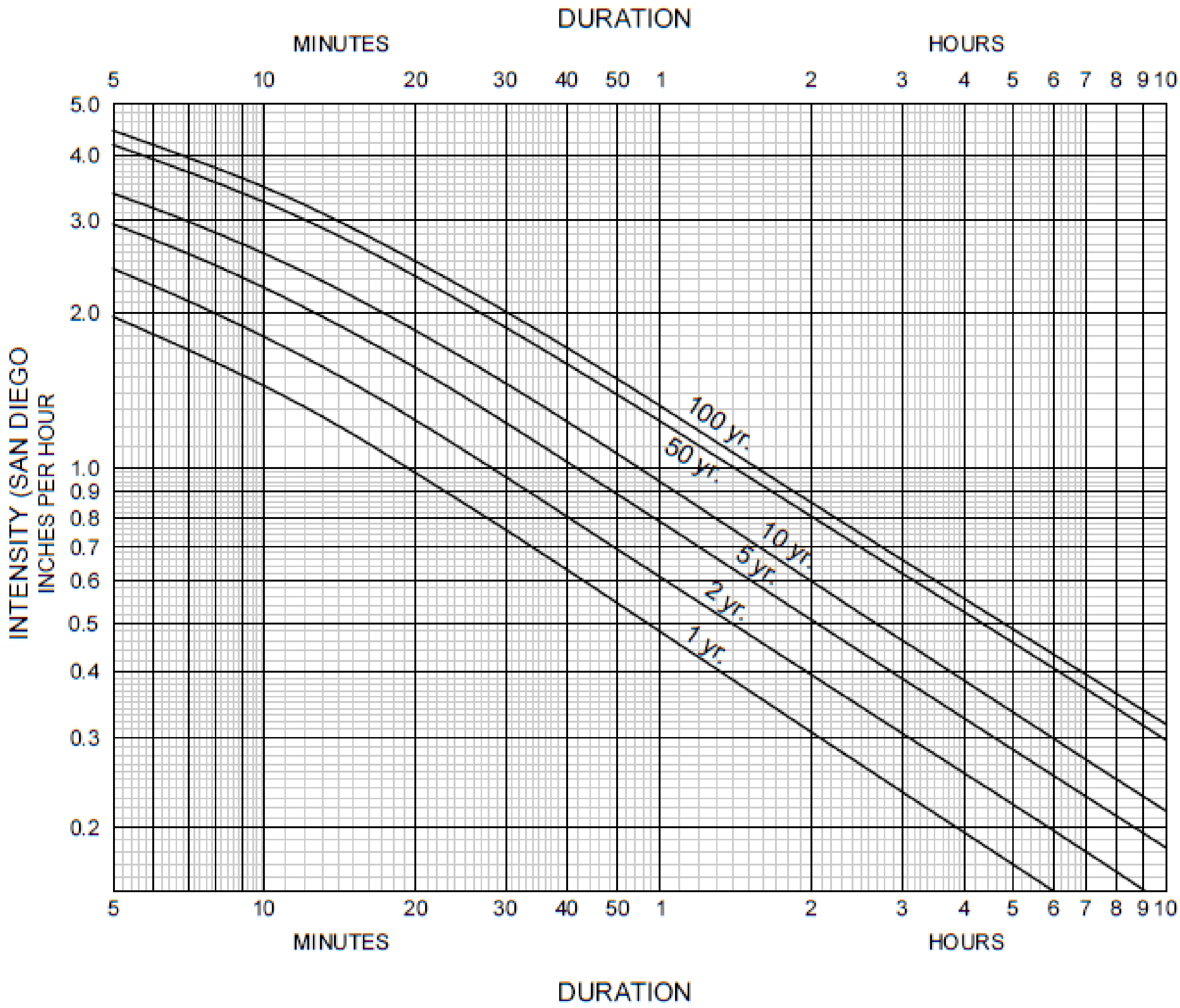


Figure A-1. Intensity-Duration-Frequency Design Chart

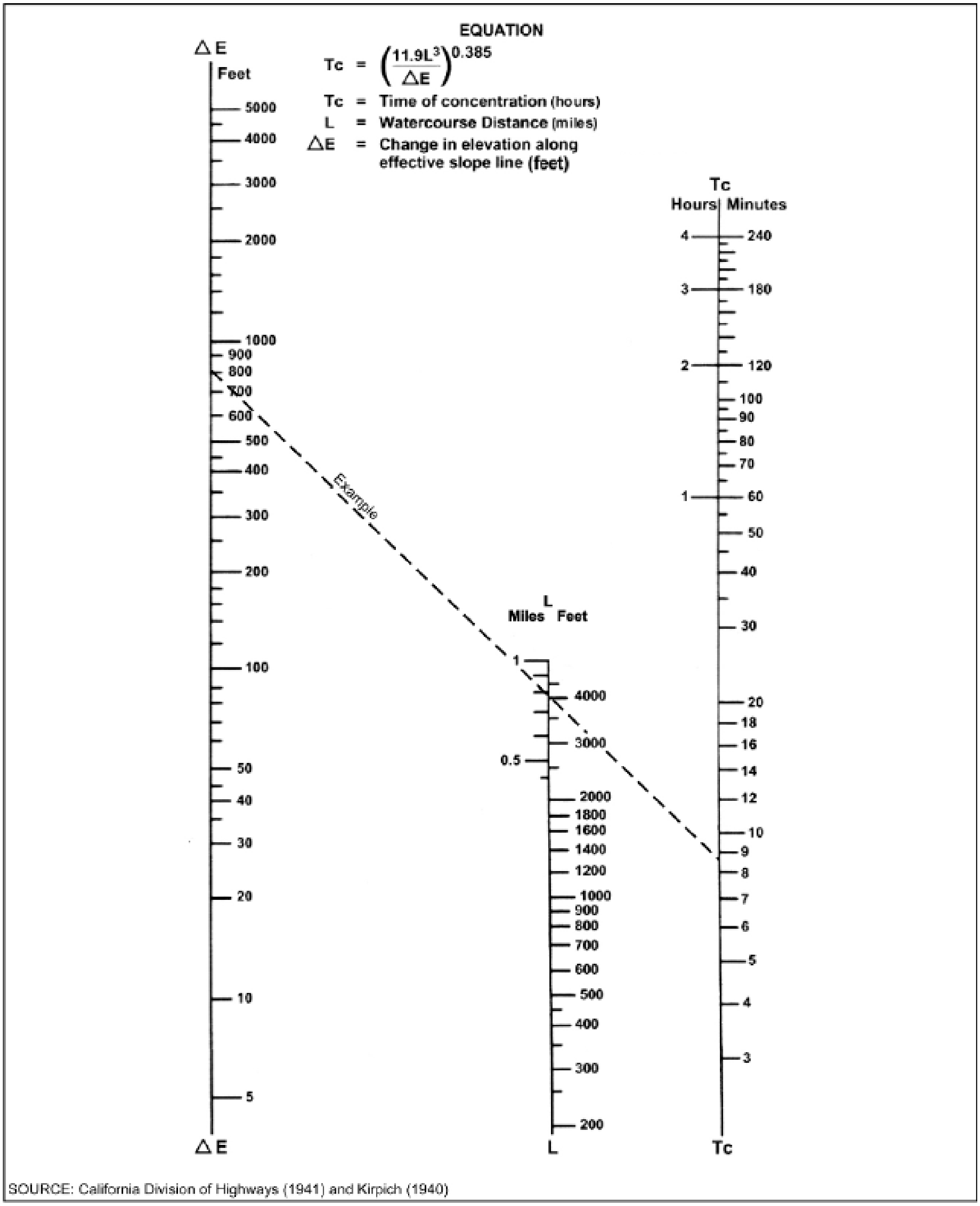


Figure A-2. Nomograph for Determination of T_c for Natural Watersheds

__Note__: Add ten minutes to the computed time of concentration from Figure A-2.

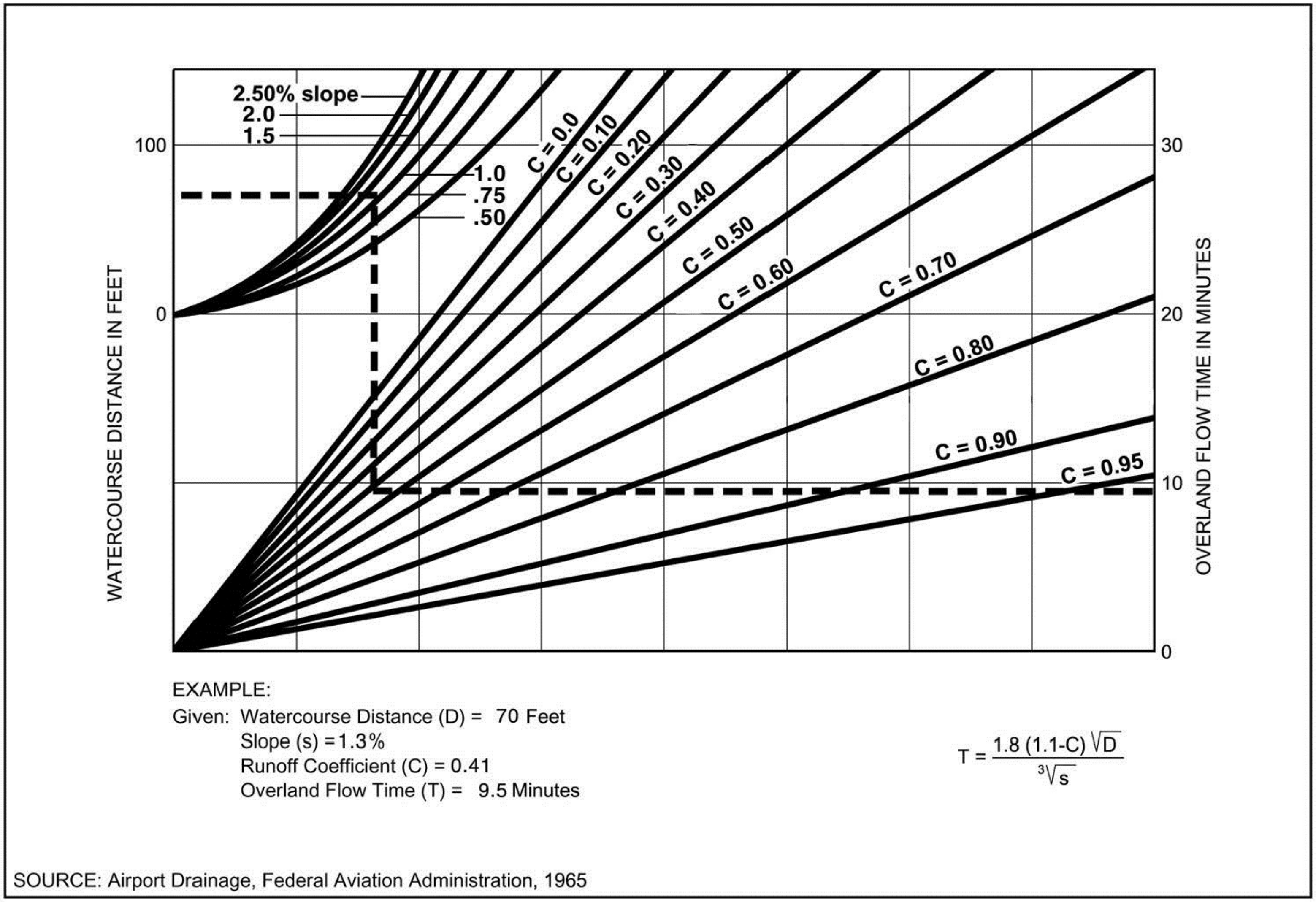


Figure A-4. Rational Formula – Overland Time of Flow Nomograph

<u>Note</u>: Use formula for watercourse distances in excess of 100 feet.

```
            San Diego County Rational Hydrology Program

      CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.4

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
Rational Hydrology Study        Date: 07/12/18
------------------------------------------------------------------------
```

California Terraces - PA61
Preliminary Hydrology
Existing Conditions
50-Year Storm Event

```
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 4028

------------------------------------------------------------------------
Rational hydrology study storm event year is    50.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      10.000 to Point/Station      12.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration computed by the
natural watersheds nomograph (App X-A)
TC = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr) + 10 min.
Initial subarea flow distance  =  532.000(Ft.)
Highest elevation =  535.000(Ft.)
Lowest elevation =  527.000(Ft.)
Elevation difference =    8.000(Ft.)
TC=[(11.9*0.1008^3)/(  8.00)]^.385=  4.94 + 10 min. =    14.94 min.
Rainfall intensity (I) =      2.712(In/Hr) for a    50.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
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```
Subarea runoff =      2.733(CFS)
Total initial stream area =       2.240(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      12.000 to Point/Station      14.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =   527.000(Ft.)
Downstream point elevation =   520.200(Ft.)
Channel length thru subarea  =   772.000(Ft.)
Channel base width=   20.000(Ft.)
Slope or 'Z' of left channel bank =  50.000
Slope or 'Z' of right channel bank =  50.000
Estimated mean flow rate at midpoint of channel =      8.481(CFS)
Manning's 'N'    = 0.040
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =      8.481(CFS)
Depth of flow =   0.242(Ft.), Average velocity =   1.093(Ft/s)
Channel flow top width =   44.175(Ft.)
Flow Velocity =    1.09(Ft/s)
Travel time  =   11.77 min.
Time of concentration =   26.70 min.
Critical depth =      0.154(Ft.)
 Adding area flow to channel
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      2.061(In/Hr) for a    50.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      8.735(CFS) for    9.420(Ac.)
Total runoff =     11.468(CFS)Total area =       11.66(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      20.000 to Point/Station      22.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration computed by the
natural watersheds nomograph (App X-A)
TC = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr) + 10 min.
Initial subarea flow distance  =  478.000(Ft.)
Highest elevation =  537.200(Ft.)
Lowest elevation =  523.000(Ft.)
Elevation difference =   14.200(Ft.)
```

```
TC=[(11.9*0.0905^3)/( 14.20)]^.385=  3.50 + 10 min. =    13.50 min.
Rainfall intensity (I) =      2.828(In/Hr) for a    50.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      4.059(CFS)
Total initial stream area =        3.190(Ac.)
End of computations, total study area =          14.850 (Ac.)
```

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          San Diego County Rational Hydrology Program

     CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.4

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
Rational Hydrology Study        Date: 07/12/18
------------------------------------------------------------------------
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California Terraces - PA61
Preliminary Hydrology
Existing Conditions
100-Year Storm Event

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------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

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Program License Serial Number 4028

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       12.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration computed by the
natural watersheds nomograph (App X-A)
TC = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr) + 10 min.
Initial subarea flow distance  =  532.000(Ft.)
Highest elevation =  535.000(Ft.)
Lowest elevation =  527.000(Ft.)
Elevation difference =    8.000(Ft.)
TC=[(11.9*0.1008^3)/(  8.00)]^.385=  4.94 + 10 min. =    14.94 min.
Rainfall intensity (I) =      2.910(In/Hr) for a   100.0 year storm
```

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Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      2.933(CFS)
Total initial stream area =       2.240(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      12.000 to Point/Station      14.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =   527.000(Ft.)
Downstream point elevation =   520.200(Ft.)
Channel length thru subarea  =   772.000(Ft.)
Channel base width=   20.000(Ft.)
Slope or 'Z' of left channel bank =  50.000
Slope or 'Z' of right channel bank =  50.000
Estimated mean flow rate at midpoint of channel =      9.100(CFS)
Manning's 'N'    = 0.040
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =      9.100(CFS)
Depth of flow =   0.251(Ft.), Average velocity =   1.116(Ft/s)
Channel flow top width =   45.073(Ft.)
Flow Velocity =    1.12(Ft/s)
Travel time  =   11.53 min.
Time of concentration =   26.47 min.
Critical depth =      0.162(Ft.)
 Adding area flow to channel
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Rainfall intensity =      2.252(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      9.545(CFS) for    9.420(Ac.)
Total runoff =     12.479(CFS)Total area =       11.66(Ac.)


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Process from Point/Station      20.000 to Point/Station      22.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration computed by the
natural watersheds nomograph (App X-A)
TC = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr) + 10 min.
Initial subarea flow distance  =  478.000(Ft.)
Highest elevation =  537.200(Ft.)
Lowest elevation =  523.000(Ft.)
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```
Elevation difference =   14.200(Ft.)
TC=[(11.9*0.0905^3)/( 14.20)]^.385=  3.50 + 10 min. =    13.50 min.
Rainfall intensity (I) =      3.024(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.450
Subarea runoff =      4.341(CFS)
Total initial stream area =        3.190(Ac.)
End of computations, total study area =          14.850 (Ac.)
```

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.4

Rational method hydrology program based on
San Diego County Flood Control Division 1985 hydrology manual
Rational Hydrology Study   Date: 09/19/18

California Terraces - PA61
Preliminary Hydrology
Proposed Conditions
50-Year Storm Event

 *********   Hydrology Study Control Information **********

Program License Serial Number 4028

Rational hydrology study storm event year is   50.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity) = 1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method

++
Process from Point/Station   10.000 to Point/Station   12.000
**** INITIAL AREA EVALUATION ****

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Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type   ]
Initial subarea flow distance = 222.000(Ft.)
Highest elevation = 531.000(Ft.)
Lowest elevation = 528.500(Ft.)
Elevation difference =   2.500(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =   10.31 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.7000)*(222.000^.5)/(1.126^(1/3)]= 10.31
Rainfall intensity (I) =   3.151(In/Hr) for a   50.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.700
Subarea runoff =   0.993(CFS)
Total initial stream area =   0.450(Ac.)

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Process from Point/Station      12.000 to Point/Station      14.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Time of concentration =    10.31 min.
Rainfall intensity =      3.151(In/Hr) for a    50.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      6.397(CFS) for    2.900(Ac.)
Total runoff =      7.390(CFS)Total area =       3.35(Ac.)


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Process from Point/Station      12.000 to Point/Station      14.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   528.500(Ft.)
Downstream point/station elevation =   526.300(Ft.)
Pipe length  =   750.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.390(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     7.390(CFS)
Normal flow depth in pipe =   15.02(In.)
Flow top width inside pipe =   18.95(In.)
Critical Depth =   12.08(In.)
Pipe flow velocity =      4.01(Ft/s)
Travel time through pipe =    3.11 min.
Time of concentration (TC) =    13.43 min.


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Process from Point/Station      16.000 to Point/Station      14.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Time of concentration =    13.43 min.
Rainfall intensity =      2.834(In/Hr) for a    50.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      2.479(CFS) for    1.250(Ac.)
Total runoff =      9.870(CFS)Total area =       4.60(Ac.)


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Process from Point/Station      14.000 to Point/Station      18.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   526.300(Ft.)
Downstream point/station elevation =   524.900(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.870(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     9.870(CFS)
Normal flow depth in pipe =   13.99(In.)
Flow top width inside pipe =   14.98(In.)
Critical Depth =   14.54(In.)
Pipe flow velocity =      6.69(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =    13.78 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station       18.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Time of concentration =    13.78 min.
Rainfall intensity =      2.803(In/Hr) for a    50.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      8.595(CFS) for    4.380(Ac.)
Total runoff =     18.465(CFS)Total area =       8.98(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       18.000 to Point/Station       20.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   524.900(Ft.)
Downstream point/station elevation =   521.500(Ft.)
Pipe length  =   167.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    18.465(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    18.465(CFS)
Normal flow depth in pipe =   14.44(In.)
Flow top width inside pipe =   19.47(In.)
Critical Depth =   18.69(In.)
Pipe flow velocity =     10.48(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    14.05 min.


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Process from Point/Station       22.000 to Point/Station       20.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
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Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Time of concentration =    14.05 min.
Rainfall intensity =      2.782(In/Hr) for a    50.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      0.428(CFS) for    0.220(Ac.)
Total runoff =     18.893(CFS)Total area =       9.20(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       24.000 to Point/Station       20.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Time of concentration =    14.05 min.
Rainfall intensity =      2.782(In/Hr) for a    50.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      0.428(CFS) for    0.220(Ac.)
Total runoff =     19.322(CFS)Total area =       9.42(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       20.000 to Point/Station       26.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   521.500(Ft.)
Downstream point/station elevation =   518.290(Ft.)
Pipe length  =   458.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    19.322(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    19.322(CFS)
Normal flow depth in pipe =   20.16(In.)
Flow top width inside pipe =   17.60(In.)
Critical Depth =   18.96(In.)
Pipe flow velocity =      6.86(Ft/s)
Travel time through pipe =    1.11 min.
Time of concentration (TC) =    15.16 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       32.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
```

```
[MULTI - UNITS area type                      ]
Initial subarea flow distance  =  210.000(Ft.)
Highest elevation =  529.000(Ft.)
Lowest elevation =  524.800(Ft.)
Elevation difference =    4.200(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     8.28 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.7000)*( 210.000^.5)/( 2.000^(1/3)]=   8.28
Rainfall intensity (I) =      3.442(In/Hr) for a    50.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.700
Subarea runoff =      0.386(CFS)
Total initial stream area =        0.160(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       32.000 to Point/Station       34.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   524.800(Ft.)
Downstream point/station elevation =   524.600(Ft.)
Pipe length  =    18.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.386(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.386(CFS)
Normal flow depth in pipe =    3.53(In.)
Flow top width inside pipe =    5.91(In.)
Critical Depth =    3.79(In.)
Pipe flow velocity =      3.21(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =     8.37 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       35.000 to Point/Station       34.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                      ]
Time of concentration =     8.37 min.
Rainfall intensity =      3.427(In/Hr) for a    50.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      0.384(CFS) for    0.160(Ac.)
Total runoff =      0.769(CFS)Total area =        0.32(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       34.000 to Point/Station       36.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   524.500(Ft.)
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Downstream point/station elevation =   521.540(Ft.)
Pipe length  =   423.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.769(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.769(CFS)
Normal flow depth in pipe =    4.79(In.)
Flow top width inside pipe =    8.98(In.)
Critical Depth =    4.80(In.)
Pipe flow velocity =      3.21(Ft/s)
Travel time through pipe =    2.19 min.
Time of concentration (TC) =    10.57 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       38.000 to Point/Station       36.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration =    10.57 min.
Rainfall intensity =      3.121(In/Hr) for a    50.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      7.176(CFS) for    5.110(Ac.)
Total runoff =      7.945(CFS)Total area =        5.43(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       36.000 to Point/Station       40.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   522.400(Ft.)
Downstream point/station elevation =   522.100(Ft.)
Pipe length  =    53.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.945(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     7.945(CFS)
Normal flow depth in pipe =   14.84(In.)
Flow top width inside pipe =   13.70(In.)
Critical Depth =   13.11(In.)
Pipe flow velocity =      5.10(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =    10.74 min.
End of computations, total study area =          14.850 (Ac.)
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                    San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.4

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
Rational Hydrology Study        Date: 09/19/18
------------------------------------------------------------------------
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California Terraces - PA61
Preliminary Hydrology
Proposed Conditions
100-Year Storm Event

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 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 4028

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       12.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Initial subarea flow distance  =  222.000(Ft.)
Highest elevation =  531.000(Ft.)
Lowest elevation =  528.500(Ft.)
Elevation difference =    2.500(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =    10.31 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.7000)*( 222.000^.5)/( 1.126^(1/3)]=  10.31
Rainfall intensity (I) =      3.337(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.700
Subarea runoff =      1.051(CFS)
Total initial stream area =       0.450(Ac.)
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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.000 to Point/Station      14.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Time of concentration =    10.31 min.
Rainfall intensity =      3.337(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      6.774(CFS) for    2.900(Ac.)
Total runoff =      7.825(CFS)Total area =       3.35(Ac.)


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Process from Point/Station       12.000 to Point/Station      14.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   528.500(Ft.)
Downstream point/station elevation =   526.300(Ft.)
Pipe length  =   750.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.825(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     7.825(CFS)
Normal flow depth in pipe =   15.75(In.)
Flow top width inside pipe =   18.19(In.)
Critical Depth =   12.45(In.)
Pipe flow velocity =      4.04(Ft/s)
Travel time through pipe =    3.09 min.
Time of concentration (TC) =    13.40 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       16.000 to Point/Station      14.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Time of concentration =    13.40 min.
Rainfall intensity =      3.032(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      2.653(CFS) for    1.250(Ac.)
Total runoff =     10.478(CFS)Total area =       4.60(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station      18.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
__________________________________________________________________________
Upstream point/station elevation =   526.300(Ft.)
Downstream point/station elevation =   524.900(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.478(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.478(CFS)
Normal flow depth in pipe =   14.91(In.)
Flow top width inside pipe =   13.58(In.)
Critical Depth =   14.92(In.)
Pipe flow velocity =      6.70(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =    13.76 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station       18.000
**** SUBAREA FLOW ADDITION ****
__________________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Time of concentration =    13.76 min.
Rainfall intensity =      3.002(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      9.205(CFS) for    4.380(Ac.)
Total runoff =     19.683(CFS)Total area =        8.98(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       18.000 to Point/Station       20.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
__________________________________________________________________________
Upstream point/station elevation =   524.900(Ft.)
Downstream point/station elevation =   521.500(Ft.)
Pipe length  =   167.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    19.683(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    19.683(CFS)
Normal flow depth in pipe =   15.16(In.)
Flow top width inside pipe =   18.81(In.)
Critical Depth =   19.08(In.)
Pipe flow velocity =     10.59(Ft/s)
Travel time through pipe =    0.26 min.
Time of concentration (TC) =    14.02 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       22.000 to Point/Station       20.000
**** SUBAREA FLOW ADDITION ****
__________________________________________________________________________
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Time of concentration =    14.02 min.
Rainfall intensity =      2.981(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      0.459(CFS) for    0.220(Ac.)
Total runoff =     20.142(CFS)Total area =       9.20(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      24.000 to Point/Station      20.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                     ]
Time of concentration =    14.02 min.
Rainfall intensity =      2.981(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      0.459(CFS) for    0.220(Ac.)
Total runoff =     20.601(CFS)Total area =       9.42(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      20.000 to Point/Station      26.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   521.500(Ft.)
Downstream point/station elevation =   518.290(Ft.)
Pipe length  =   458.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.601(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    20.601(CFS)
Normal flow depth in pipe =   18.19(In.)
Flow top width inside pipe =   25.32(In.)
Critical Depth =   19.05(In.)
Pipe flow velocity =      7.24(Ft/s)
Travel time through pipe =    1.05 min.
Time of concentration (TC) =    15.08 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      30.000 to Point/Station      32.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
```

```
[MULTI - UNITS area type                         ]
Initial subarea flow distance  =  210.000(Ft.)
Highest elevation =  529.000(Ft.)
Lowest elevation =  524.800(Ft.)
Elevation difference =    4.200(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     8.28 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.7000)*( 210.000^.5)/( 2.000^(1/3)]=   8.28
Rainfall intensity (I) =      3.613(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.700
Subarea runoff =      0.405(CFS)
Total initial stream area =        0.160(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       32.000 to Point/Station       34.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   524.800(Ft.)
Downstream point/station elevation =   524.600(Ft.)
Pipe length  =    18.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.405(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.405(CFS)
Normal flow depth in pipe =    3.64(In.)
Flow top width inside pipe =    5.86(In.)
Critical Depth =    3.89(In.)
Pipe flow velocity =      3.24(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =     8.37 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       35.000 to Point/Station       34.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[MULTI - UNITS area type                         ]
Time of concentration =     8.37 min.
Rainfall intensity =      3.599(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.700
Subarea runoff =      0.403(CFS) for    0.160(Ac.)
Total runoff =      0.808(CFS)Total area =        0.32(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       34.000 to Point/Station       36.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   524.500(Ft.)
```

```
Downstream point/station elevation =   521.540(Ft.)
Pipe length  =   423.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.808(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.808(CFS)
Normal flow depth in pipe =    4.94(In.)
Flow top width inside pipe =    8.96(In.)
Critical Depth =    4.93(In.)
Pipe flow velocity =      3.25(Ft/s)
Travel time through pipe =    2.17 min.
Time of concentration (TC) =    10.54 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       38.000 to Point/Station       36.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
[RURAL(greater than 0.5 Ac, 0.2 ha) area type]
Time of concentration =    10.54 min.
Rainfall intensity =      3.310(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.450
Subarea runoff =      7.612(CFS) for    5.110(Ac.)
Total runoff =      8.420(CFS)Total area =       5.43(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       36.000 to Point/Station       40.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   522.400(Ft.)
Downstream point/station elevation =   522.100(Ft.)
Pipe length  =    53.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.420(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     8.420(CFS)
Normal flow depth in pipe =   16.20(In.)
Flow top width inside pipe =   10.80(In.)
Critical Depth =   13.49(In.)
Pipe flow velocity =      5.03(Ft/s)
Travel time through pipe =    0.18 min.
Time of concentration (TC) =    10.72 min.
End of computations, total study area =         14.850 (Ac.)
```

APPENDIX B

NORMAL DEPTH ANALYSES

Worksheet for Circular Pipe - Node 20 to 22

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01000	ft/ft
Diameter	1.50	ft
Discharge	0.40	ft³/s

Results

Normal Depth	0.20	ft
Flow Area	0.14	ft²
Wetted Perimeter	1.12	ft
Hydraulic Radius	0.12	ft
Top Width	1.02	ft
Critical Depth	0.23	ft
Percent Full	13.3	%
Critical Slope	0.00527	ft/ft
Velocity	2.86	ft/s
Velocity Head	0.13	ft
Specific Energy	0.33	ft
Froude Number	1.36	
Maximum Discharge	11.30	ft³/s
Discharge Full	10.50	ft³/s
Slope Full	0.00001	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	13.33	%
Downstream Velocity	Infinity	ft/s

Worksheet for Circular Pipe - Node 20 to 24

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01000	ft/ft
Diameter	1.50	ft
Discharge	0.40	ft³/s

Results

Normal Depth	0.20	ft
Flow Area	0.14	ft²
Wetted Perimeter	1.12	ft
Hydraulic Radius	0.12	ft
Top Width	1.02	ft
Critical Depth	0.23	ft
Percent Full	13.3	%
Critical Slope	0.00527	ft/ft
Velocity	2.86	ft/s
Velocity Head	0.13	ft
Specific Energy	0.33	ft
Froude Number	1.36	
Maximum Discharge	11.30	ft³/s
Discharge Full	10.50	ft³/s
Slope Full	0.00001	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	13.33	%
Downstream Velocity	Infinity	ft/s

Worksheet for Circular Pipe - Node 20 to 26

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00700	ft/ft
Diameter	2.00	ft
Discharge	19.00	ft^3/s

Results

Normal Depth	1.65	ft
Flow Area	2.77	ft^2
Wetted Perimeter	4.55	ft
Hydraulic Radius	0.61	ft
Top Width	1.53	ft
Critical Depth	1.57	ft
Percent Full	82.3	%
Critical Slope	0.00769	ft/ft
Velocity	6.87	ft/s
Velocity Head	0.73	ft
Specific Energy	2.38	ft
Froude Number	0.90	
Maximum Discharge	20.36	ft^3/s
Discharge Full	18.93	ft^3/s
Slope Full	0.00705	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	82.32	%
Downstream Velocity	Infinity	ft/s

Worksheet for Circular Pipe - Node 32 to 34

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01000	ft/ft
Diameter	1.50	ft
Discharge	0.40	ft³/s

Results

Normal Depth	0.20	ft
Flow Area	0.14	ft²
Wetted Perimeter	1.12	ft
Hydraulic Radius	0.12	ft
Top Width	1.02	ft
Critical Depth	0.23	ft
Percent Full	13.3	%
Critical Slope	0.00527	ft/ft
Velocity	2.86	ft/s
Velocity Head	0.13	ft
Specific Energy	0.33	ft
Froude Number	1.36	
Maximum Discharge	11.30	ft³/s
Discharge Full	10.50	ft³/s
Slope Full	0.00001	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	13.33	%
Downstream Velocity	Infinity	ft/s

Worksheet for Circular Pipe - Node 34 to 35

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01000	ft/ft
Diameter	1.50	ft
Discharge	0.40	ft³/s

Results

Normal Depth	0.20	ft
Flow Area	0.14	ft²
Wetted Perimeter	1.12	ft
Hydraulic Radius	0.12	ft
Top Width	1.02	ft
Critical Depth	0.23	ft
Percent Full	13.3	%
Critical Slope	0.00527	ft/ft
Velocity	2.86	ft/s
Velocity Head	0.13	ft
Specific Energy	0.33	ft
Froude Number	1.36	
Maximum Discharge	11.30	ft³/s
Discharge Full	10.50	ft³/s
Slope Full	0.00001	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	13.33	%
Downstream Velocity	Infinity	ft/s

Worksheet for Circular Pipe - Node 34 to 36

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00700	ft/ft
Diameter	1.50	ft
Discharge	0.80	ft³/s

Results

Normal Depth	0.31	ft
Flow Area	0.26	ft²
Wetted Perimeter	1.41	ft
Hydraulic Radius	0.18	ft
Top Width	1.21	ft
Critical Depth	0.33	ft
Percent Full	20.4	%
Critical Slope	0.00498	ft/ft
Velocity	3.09	ft/s
Velocity Head	0.15	ft
Specific Energy	0.45	ft
Froude Number	1.18	
Maximum Discharge	9.45	ft³/s
Discharge Full	8.79	ft³/s
Slope Full	0.00006	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	20.39	%
Downstream Velocity	Infinity	ft/s

Attachment 6
Geotechnical and Groundwater Investigation Report

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

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INFILTRATION FEASIBILITY CONDITION LETTER

OCEANVIEW HILLS – PA 61
SAN DIEGO, CALIFORNIA

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

PARDEE HOMES
SAN DIEGO, CALIFORNIA

SEPTEMBER 17, 2018
PROJECT NO. 07955-42-02

Project No. 07955-42-02
September 17, 2018

Pardee Homes
13400 Sabre Springs Parkway, Suite 200
San Diego, California 92128

Attention: Mr. Allen Kashani

Subject: INFILTRATION FEASIBILITY CONDITION LETTER
OCEANVIEW HILLS – PA 61
SAN DIEGO, CALIFORNIA

References:
1. *Update Geotechnical Investigation, Oceanview Hills – PA 61, San Diego, California,* prepared by Geocon Incorporated, dated March 15, 2018 (Project No. 07955-42-02).
2. *DMA and Hydromodification Management Exhibit,* prepared by Civil Sense, Inc., undated.

Dear Mr. Kashani:

In accordance with the request of Civil Sense, Inc., we have prepared this report regarding storm water management for the subject project. Previous recommendations specific to storm water management, as well as a summary of expected soil conditions, is provided in the Reference 1. We are recommending the site be classified as a "No Infiltration" condition.

SITE AND PROJECT DESCRIPTION

Planning Area 61 consists of a 13.7-acre, vacant lot, located southeast of the intersection of Caliente Avenue and Old Otay Mesa Road in San Diego, California. The property is currently covered with weeds and brush. The property is generally flat with site elevations ranging from 530 Mean Sea Elevation (MSL) near the southwest corner to 518 MSL in a desilting basin that was constructed previously at the northeast corner of the site. With the exception of the detention basin, the site appears to be in its natural condition.

We understand the site will be developed to accommodate 29, multi-family structures with associated utilities, streets and alleys, concrete hardscape walkways, a small park, and landscaping. A retaining wall with a maximum height of 7 feet is planned at the southeast corner of the site. The western 4.6 acres of the site is currently planned for commercial use. Based on the grading plan, grading across the residential portion will result in fills of approximately 1 foot to 8 feet. Across the commercial area, cuts of approximately 1 to 4 feet will be made.

PREVIOUS GEOTECHNICAL STUDIES

We prepared a geotechnical investigation in March 2018 (see Reference 1). Recommendations for storm water management were included in Appendix C of the report. This information was provided as part of the discretionary review process. The site is underlain topsoil overlying very old paralic deposits. Scattered pockets of undocumented fill are also present on the property. The undocumented fill was found to be loose clayey sand. The topsoil is composed of sandy to silty clay. The very old paralic deposits were found to consist of very dense clayey sand and silty to sandy clay. The topsoil and clayey portion of the very old paralic deposits is highly expansive. A Geologic Map is provided on Figure 1 and shows the locations of borings, trench logs, and infiltration test locations.

HYDROLOGIC SOIL GROUP

The United States Department of Agriculture (USDA), Natural Resources Conservation Services, provides general information regarding soil conditions for areas within the United States. The USDA website also provides the Hydrologic Soil Group. Table 1 presents the descriptions of the hydrologic soil groups.

TABLE 1
HYDROLOGIC SOIL GROUP DEFINITIONS

Soil Group	Soil Group Definition
A	Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
B	Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
C	Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
D	Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The property falls within Hydraulic Soil Group D, which has a very slow infiltration rating. Table 2 presents the information from the USDA website for the property.

TABLE 2
USDA WEB SOIL SURVEY – HYDROLOGIC SOIL GROUP

Map Unit Name	Map Unit Symbol	Approximate Percentage of Property	Hydrologic Soil Group	k_{SAT} of Most Limiting Layer (inches/ hour)
Stockpen gravelly clay loam, 2 to 5 percent slopes	SuB	100	D	0.00 to 0.06

GROUNDWATER ELEVATIONS

Groundwater was not encountered in our field exploration. Ground water is expected to be at depths greater than 50 feet below the property.

INFILTRATION RATES

We performed 2 field-saturated, hydraulic conductivity tests at the site using a Soil Moisture Corp Aardvark Permeameter at the locations presented on the Geologic Map, Figure 1. The borings were excavated with a 4-inch-diameter hand auger. Table 3 presents the results of the saturated hydraulic conductivity testing.

We used the guidelines presented in the Riverside County Low Impact Development BMP Design Handbook which references the United States Bureau of Reclamation Well Permeameter Test Method (USBR 7300-89). Based on this widely accepted guideline, the saturated hydraulic conductivity (Ksat) is equal to the infiltration rate. Therefore, the Ksat value determined from the Aardvark Permeameter test is the unfactored infiltration rate. The Ksat (infiltration rate) equation provided in the Riverside County Handbook was used to compute the unfactored infiltration rate.

TABLE 3
UNFACTORED, FIELD-SATURATED, INFILTRATION TEST RESULTS
USING THE SOILMOISTURE CORP AARDVARK PERMEAMETER

Test No.	Depth (inches)	Geologic Unit	Field Infiltration Rate, I (in/hr)	Factored* Field Infiltration Rate, I (in/hr)
A-1	45	Terrace Deposits	0.002	0.001
A-2	48	Terrace Deposits	0.068	0.034

*Factor of Safety of 2.0 for feasibility determination.

STORM WATER DESIGN NARRATIVE

We evaluated the site for areas of potential infiltration. The site is underlain by undocumented fill, topsoil and very dense very old paralic deposits. The undocumented fill and topsoil will be removed and replaced as compacted fill during remedial grading. The very old paralic deposits will be left in-place. Based on infiltration testing and our experience in the area, the very old paralic deposits do not exhibit infiltration rates high enough to support full or partial infiltration. In addition, the upper portion of the very old paralic deposits exhibit a high expansion potential. Infiltrating into these soils will cause soil heave and potential distress to structural improvements. Also, after the completion of grading, the site will be underlain by 3 feet to 10 feet of compacted fill. Infiltrating into the compacted fill is not recommended due to the potential to cause settlement.

From a civil design perspective, the site does not allow for suitable setbacks from BMPs to structural improvements. Civil Sense Inc. has elected to use flow control values and has positioned them at the down gradient end of the DMA areas.

In our opinion, there are no areas on the site that will support full or partial infiltration considering existing soil conditions and soil conditions that will be present at the completion of grading.

DMA EXHIBIT AND GEOLOGIC MAP

We have appended to this report a copy of the DMA map, Reference 2. We have annotated it to show the expected depth of fill at each BMP location. All of the BMPs are located within or adjacent to structural improvements or utilities. We have also appended the geotechnical map. The geotechnical map shows the locations of borings, trenches, and infiltration locations, as well as the locations of utilities, proposed structures and improvements.

STORM WATER MANAGEMENT DEVICES

For flow-controlled vaults, we recommend the vaults not allow infiltration. If basins are planned, liners and subdrains are recommended. The liners should be impermeable (e.g. High-density polyethylene, HDPE, with a thickness of about 30 mil or equivalent Polyvinyl Chloride**,** PVC). The subdrains should be perforated within the liner area, installed at the base and above the liner, be at least 3 inches in diameter and consist of Schedule 40 PVC pipe. The subdrains outside of the liner should consist of solid pipe. The penetration of the liners at the subdrains should be properly waterproofed. The subdrains should be connected to a proper outlet. The devices should also be installed in accordance with the manufacturer's recommendations.

CONCLUSIONS AND RECOMMENDATIONS

Our results indicate the site has very slow infiltration characteristics due to the dense nature of the Very Old Paralic Deposits. Laboratory testing indicates the upper clayey portion of the Very Old Paralic Deposits is highly expansive. Some areas of the site will be underlain by compacted fill. Because of the slow infiltration characteristics, expansive nature of the on-site soils, and the presence of compacted fill at the completion of grading, full and partial infiltration is infeasible on this site.

In our professional opinion and based on our site-specific investigation, there are no areas of the site where any amount of storm water infiltration is feasible. The infiltration rates are too low and/or there is an un-mitigatable risk of lateral flow to adjacent rights-of-way, utility trenches, and buildings. Additionally, the upper portion of the Very Old Paralic Deposits is highly expansive, and in some locations compacted fill in excess of 5 feet will be present at the BMP locations.

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

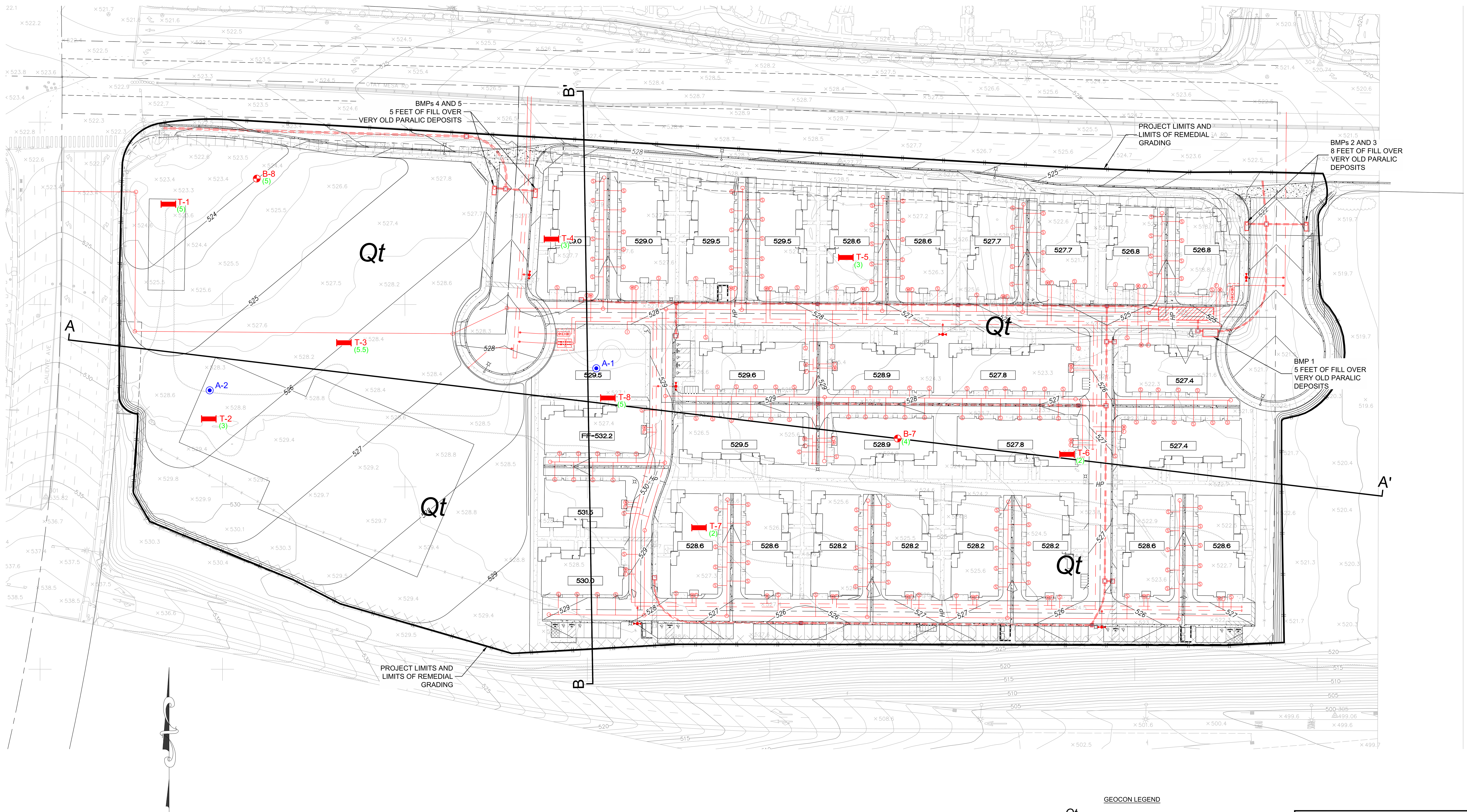
Very truly yours,

GEOCON INCORPORATED

Rodney C. Mikesell
GE 2533

RCM:dmc

(e-mail) Addressee
(2/del) Civil Sense, Inc.
Attention: Ms. Maykia Vang



GRAPHIC SCALE

0' 25' 50' 75' 100' 150' 200'

SCALE 1"=50' (on 36x24)

GEOCON LEGEND

Qt ....TERRACE DEPOSITS

T-8 ....APPROX. LOCATION OF TRENCH

A-2 ....APPROX. LOCATION OF INFILTRATION TEST

B-8 ....APPROX. LOCATION OF PREVIOUS BORING (Geocon)

(5.5) ....APPROX. THICKNESS OF SURFICIAL SOIL

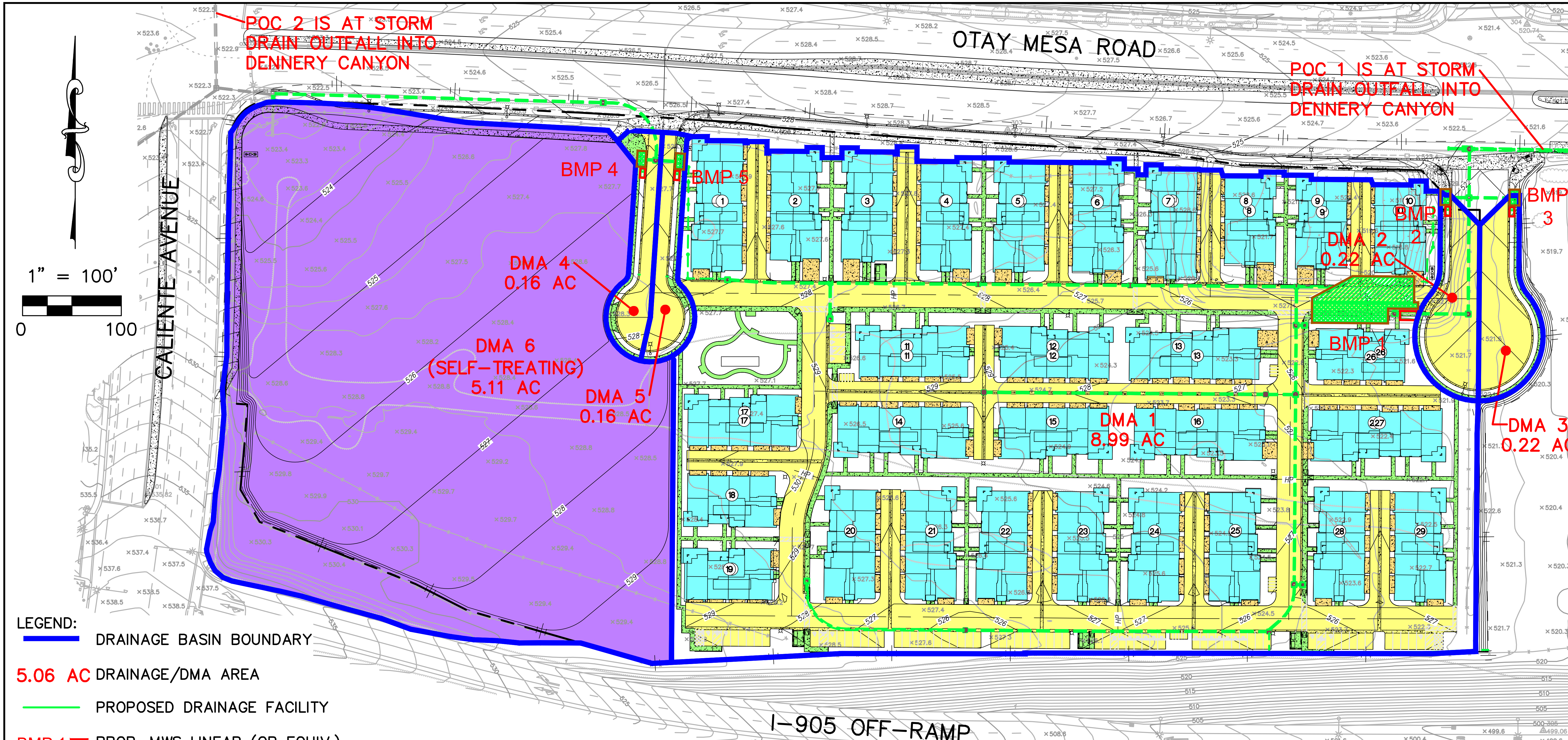
B B' ....APPROX. LOCATION OF GEOLOGIC CROSS SECTION

GEOLOGIC MAP

OCEANVIEW HILLS - PA 61
SAN DIEGO, CALIFORNIA

GEOCON INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

SCALE 1" = 50'	DATE 09 - 17 - 2018		
PROJECT NO. 07955 - 42 - 02		FIGURE 1	
SHEET 1 OF 1			



LEGEND:

- DRAINAGE BASIN BOUNDARY
- 5.06 AC DRAINAGE/DMA AREA
- PROPOSED DRAINAGE FACILITY
- BMP 1 PROP. MWS LINEAR (OR EQUIV.)
- PROP. FLOW CONTROL VAULT
- PROPOSED BUILDINGS
- PROPOSED STREETS
- PROPOSED DRIVEWAYS
- PROPOSED HARDSCAPE
- PROPOSED LANDSCAPING
- PROPOSED SELF-MITIGATING AREA

NOTES:

THE UNDERLYING HYDROLOGIC SOIL GROUP IS D. GROUNDWATER WAS NOT ENCOUNTERED IN BORINGS UP TO 17' DEEP. THERE ARE NO EXISTING ON-SITE NATURAL HYDROLOGIC FEATURES, CCSYA, OR IMPERVIOUS AREAS.

SELF-MITIGATING AREA SHALL MEET "STORM WATER STANDARDS" REQUIREMENTS IN SECTIONS 5.2.1 AND 5.2.3.

PROPOSED IMPROVEMENTS ALONG OTAY MESA ROAD WILL MEET GREEN STREET REQUIREMENTS.

THIS SWQMP IS PRELIMINARY AND FOR ENTITLEMENTS. AN APPROVED EQUIVALENT TO MWS LINEAR CAN BE SELECTED DURING FINAL ENGINEERING. THE VAULT VOLUMES ARE ESTIMATED IN THIS SWQMP. THE VAULT DETAILS WILL BE DESIGNED DURING FINAL ENGINEERING. THE FLOW CONTROL DISCHARGE OUT OF EACH VAULT SHALL MATCH THE HYDROMODIFICATION FLOW RATE.

Vault Dimensions

BMP	Depth, ft	Length, ft	Width, ft	Volume, ft
1	4 to 9	Varies	Varies	29,400
2	6	9	15	810
3	6	9	15	810
4	5	8	15	600
5	5	8	15	600

ATTACHMENT 1A AND 2A

DMA AND HYDROMODIFICATION MANAGEMENT EXHIBIT

UPDATE
GEOTECHNICAL INVESTIGATION

OCEANVIEW HILLS – PA 61
SAN DIEGO, CALIFORNIA

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

PARDEE HOMES
SAN DIEGO, CALIFORNIA

MARCH 15, 2018
PROJECT NO. 07955-42-02

Project No. 07955-42-02
March 15, 2018

Pardee Homes
13400 Sabre Springs Parkway, Suite 200
San Diego, California 92128

Attention: Mr. Allen Kashani

Subject: UPDATE GEOTECHNICAL INVESTIGATION
OCEANVIEW HILLS – PA 61
SAN DIEGO, CALIFORNIA

Dear Mr. Kashani:

In accordance with your request, we herein submit the results of our update geotechnical investigation for the subject project. We performed our investigation to evaluate the underlying soil and geologic conditions; potential geologic hazards; and to assist in the design of the proposed development. The accompanying report presents the results of our study with conclusions and recommendations pertaining to the geotechnical aspects of the proposed project. The site is suitable for the proposed development provided the recommendations of this report are incorporated into the design and construction of the planned project.

Should you have questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Noel G. Borja
Senior Staff Engineer

Rodney C. Mikesell
GE 2533

Ali Sadr
CEG 1778

NGB:RCM:AS:dmc

(e-mail) Addressee
(3/del) Civil Sense, Inc.
Attention: Ms. Maykia Vang

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UPDATE GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report presents the results of our geotechnical investigation for the proposed construction of several multi-family residential structures, a commercial area, private and public streets, and associated utilities on a vacant parcel of land located southeast of the intersection of Otay Mesa Road and Caliente Avenue in the Otay Mesa area of San Diego, California (see Vicinity Map, Figure 1). The purpose of this geotechnical investigation is to evaluate the surface and subsurface soil conditions, general site geology, and to identify geotechnical constraints that may impact the planned development.

To aid in the preparing of this report, we reviewed the following plans and geotechnical report:

1. *Site Plan, Ocean View Hills (PA-61), San Diego, California*, prepared by Civil Sense, undated.

2. *Conceptual Site Plan, Ocean View Hills (PA-61), San Diego, California*, prepared by Placeworks, dated January 5, 2017.

3. *Update Geotechnical Report, South Otay Mesa Corporate Center, California Terraces Planning Area 61, San Diego, California*, prepared by Geocon Incorporated, dated February 29, 2008 (Project No. 07955-42-01).

The field investigation consisted of excavating 7, exploratory trenches to evaluate the underlying geologic conditions within the area of planned development and performing 2, field-saturated hydraulic conductivity tests. Geocon Incorporated previously performed 2, small-diameter borings on May 14, 1984, which was included in the geotechnical investigation report listed as Reference 3. The locations of the exploratory trenches, previous borings, and hydraulic conductivity tests are shown on the Geologic Map, Figure 2. Civil Sense provided an AutoCAD file of the preliminary grading plan which was used as the base map to generate Figure 2. Logs of the exploratory trenches and borings and a detailed discussion of the field investigation are presented in Appendix A.

We performed laboratory tests on selected soil samples obtained during the field investigation to evaluate pertinent physical properties for engineering analyses and to assist in providing recommendations for site grading, foundation design criteria, and pavement design. Details of the laboratory testing and a summary of test results are presented in Appendix B.

The conclusions and recommendations presented herein are based on analyses of the data obtained from the field investigation, laboratory tests, and our experience with similar soil and geologic conditions.

2. SITE AND PROJECT DESCRIPTION

Planning Area 61 consists of a 13.7-acre, vacant lot, located southeast of the intersection of Caliente Avenue and Old Otay Mesa Road in San Diego, California. The property is currently covered with weeds and brush. The property is generally flat with site elevations ranging from 530 Mean Sea Elevation (MSL) near the southwest corner to 518 MSL in a desilting basin that was constructed previously at the northeast corner of the site.

We understand the site will be developed to accommodate 29, multi-family structures with associated utilities, streets and alleys, concrete hardscape walkways, a small park, and landscaping. A retaining wall with a maximum height of 7 feet is planned at the southeast corner of the site. The western 4.6 acres of the site is currently planned for commercial use.

Based on the grading plan, grading across the residential portion will result in fills of approximately 1 foot to 8 feet. The deeper fill will be in a detention basin at the northeast corner of the site. Across the commercial area, cuts of approximately 1 to 4 feet will be made. Minor fills of less than 1 foot from existing grade will be performed at the northwest corner.

The above locations, site descriptions, and proposed development are based on a site reconnaissance, review of published geologic literature, our field investigations, and discussions with you. If development plans differ from those described herein, we should be contacted to review the plans and provide revisions to this report as needed.

3. SOIL AND GEOLOGIC CONDITIONS

The site is underlain by two surficial materials, undocumented fill and topsoil and one geologic unit, Very Old Terrace Deposits. A description of these units is presented herein and also shown on the exploratory excavation logs in Appendix A. Geologic units are shown on Figure 2 and geologic cross sections are presented on Figure 3.

3.1 Undocumented Fill (Unmapped)

Scattered pockets of undocumented fills are present on the site. Undocumented fills were placed as stockpiles and berms around the perimeter of the site and also as ramps and jumps for off-road vehicles. The thickness of undocumented fills is unknown; however, we estimate that undocumented fill thickness will range between 1 to 5 feet. The lateral extent of the undocumented fill is also unknown and was not mapped due to heavy vegetation. Undocumented fill is will require removal and replacement as compacted fill.

3.2 Topsoil (Unmapped)

Topsoil blankets the entire site and are generally composed of soft to stiff, sandy to silty clay. The topsoil thickness likely varies from approximately 2 to 5 feet. Topsoils are compressible in their present condition and remedial grading will be required. Based on laboratory testing, the topsoil is highly expansive. Toposils are unsuitable for support of the project and should be removed and replaced as compacted fill. Expansive topsoil should be placed at a depth of at least 3 feet below finish pad subgrade.

3.3 Very Old Terrace Deposits (Qt)

Very Old Terrace Deposits, also known as Very Old Paralic Deposits, covers the site bellow the topsoil and undocumented fill as indicated in our exploratory borings and trenches. The Very Old Terrace Deposits in this area are generally comprised of highly expansive clay underlain by dense to very dense, silty to clayey sand with varying gravel and cobble content. The clayey portion covers almost the entire area of proposed development. Previous borings and recent exploratory trenches indicate that the clayey portion of terrace deposits transitions into topsoil with an approximate thickness of up to 5 feet. The highly expansive Terrace Deposits should be removed and replaced as compacted fill at a depth of at least 3 feet below planned finish grade.

Dense to very dense, sandy and cobbly layers underlie the clay. This portion of the terrace deposit is generally low expansive and possesses high shear strength characteristics. Based on the general geology of the area, the Very Old Paralic Deposits thickness is approximately 20 to 30 feet. These deposits unconformably rests on the Pliocene age San Diego Formation (Tsd). The sandy portion of the Terrace Deposits is suitable for support of the planned improvements.

4. GROUNDWATER

We did not encounter groundwater in our field investigation. Based on the proposed improvements, we do not expect groundwater to have an adverse impact on the project; however, it is not uncommon for groundwater or seepage conditions to develop where none previously existed. Groundwater elevations are dependent on seasonal precipitation, irrigation, land use, among other factors, and vary as a result. Proper surface drainage will be important to future performance of the project.

5. GEOLOGIC HAZARDS

5.1 Geologic Hazard Category

Based on our review of geologic literature and experience with the soil and geologic conditions in the general area, it is our opinion that known active, potentially active, or inactive faults are not located at the site. The site is not within a State of California Earthquake Fault Zone.

The *City of San Diego Seismic Safety Study Geologic Hazards and Faults, Sheet 7,* defines the site with a Hazard Category 53. Category 53 is defined as *Level or sloping terrain, unfavorable geologic structure, low to moderate risk.*

5.2 Faulting and Seismicity

According to the computer program *EZ-FRISK* (Version 7.65), six known active faults are located within a search radius of 50 miles from the property. The nearest known active fault is the Newport-Inglewood/Rose Canyon Fault Zone, located approximately 8 miles west of the site. The Newport-Inglewood/Rose Canyon Fault Zone is the dominant source of potential ground motion. Earthquakes that might occur on the Newport-Inglewood/Rose Canyon Fault Zone or other faults within the southern California and northern Baja California area are potential generators of significant ground motion at the site. The estimated deterministic maximum earthquake magnitude and peak ground acceleration for the Newport-Inglewood/Rose Canyon Fault Zone are 7.5 and 0.32g, respectively. Table 5.2.1 lists the estimated maximum earthquake magnitude and peak ground acceleration for the most dominant faults in relationship to the site location. We calculated peak ground acceleration (PGA) using Boore and Atkinson (2008), Campbell and Bozorgnia (2008), and Chiou and Youngs (2007) acceleration-attenuation relationships.

TABLE 5.2.1
DETERMINISTIC SPECTRA SITE PARAMETERS

Fault Name	Distance from Site (miles)	Maximum Earthquake Magnitude (Mw)	Peak Ground Acceleration		
			Boore-Atkinson NGA USGS 2008 (g)	Campbell-Bozorgnia NGA USGS 2008 (g)	Chiou-Youngs (2007) NGA USGS 2008 (g)
Newport-Inglewood/Rose Canyon	8	7.5	0.29	0.24	0.32
Rose Canyon	8	6.9	0.25	0.23	0.26
Coronado Bank	15	7.4	0.22	0.16	0.20
Palos Verdes Connected	15	7.7	0.24	0.17	0.22
Elsinore	44	7.85	0.13	0.09	0.11
Earthquake Valley	48	6.8	0.07	0.05	0.04

We used the computer program *EZ-FRISK* to perform a probabilistic seismic hazard analysis. The computer program *EZ-FRISK* operates under the assumption that the occurrence rate of earthquakes on each mapped Quaternary fault is proportional to the fault slip rate. The program accounts for earthquake magnitude as a function of fault rupture length. Site acceleration estimates are made using the earthquake magnitude and distance from the site to the rupture zone. The program also accounts for uncertainty in each of following: (1) earthquake magnitude, (2) rupture length for a given magnitude, (3) location of the rupture zone, (4) maximum possible magnitude of a given earthquake, and (5) acceleration at the site from a given earthquake along each fault. By calculating the expected accelerations from considered earthquake sources, the program calculates the total average annual expected number of occurrences of site acceleration greater than a specified value. We utilized acceleration-attenuation relationships suggested by Boore and Atkinson (2008), Campbell and Bozorgnia (2008), and Chiou and Youngs (2007) in the analysis. Table 5.2.2 presents the site-specific probabilistic seismic hazard parameters including acceleration-attenuation relationships and the probability of exceedence.

TABLE 5.2.2
PROBABILISTIC SEISMIC HAZARD PARAMETERS

Probability of Exceedence	Peak Ground Acceleration		
	Boore-Atkinson NGA USGS 2008 (g)	Campbell-Bozorgnia NGA USGS 2008 (g)	Chiou-Youngs (2007) NGA USGS 2008 (g)
2% in a 50 Year Period	0.44	0.37	0.43
5% in a 50 Year Period	0.32	0.27	0.31
10% in a 50 Year Period	0.24	0.21	0.22

While listing peak accelerations is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including frequency and duration of motion and soil conditions underlying the site. Seismic design of the structures should be evaluated in accordance with the California Building Code (CBC).

5.3 Liquefaction Potential

The risk associated with liquefaction hazard is low due to the lack of shallow groundwater and dense nature of the underlying sediments.

5.4 Subsidence

Based on the subsurface soil conditions encountered during our field investigation, the risk associated with ground subsidence is low.

5.5 Flooding

The site is not located within a designated drainage or floodplain area (FEMA, 2012). The risk associated with flooding hazard is low.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 General

6.1.1 From a geotechnical engineering standpoint, it is our opinion that the site is suitable for the proposed development provided the recommendations presented herein are implemented in design and construction of the project.

6.1.2 The site is underlain by scattered pockets of undocumented fill and topsoil. Based on the exploratory borings and trenches, the surficial soils are underlain by the Very Old Terrace Deposits. The near surface materials are considered highly expansive (EI greater than 90). Remedial grading will be required for the onsite topsoil and clayey portions of the Terrace Deposits. The sandy portions of the old terrace deposits are suitable for the support the proposed loads or additional engineered fill.

6.1.3 We did not encounter groundwater during the field investigation. We expect excavations for the proposed improvements will be relatively shallow; therefore, we do not expect groundwater to have an adverse impact on the project as currently proposed.

6.1.4 The site is located approximately 8 miles west of the Newport-Inglewood/Rose Canyon fault zone. Based on our review of available literature, active, potentially active, or presumed inactive faults do not cross the site.

6.1.5 With the exception of possible strong seismic shaking, we did not observe or know of significant geologic hazards that would adversely affect the proposed development.

6.1.6 The risks associated with soil liquefaction and flooding hazards are low.

6.1.7 The proposed residential structures can be supported on a shallow foundation system founded entirely on properly compacted fill soil.

6.1.8 Geocon Incorporated should review the foundation and improvement plans prior to finalizing. If plans differ significantly from those described herein, Geocon should be contacted to check if additional analyses will be required.

6.1.9 Subdrains are not required for this project.

6.2 Excavation and Soil Characteristics

6.2.1 Excavation of the onsite soils should be possible with moderate to heavy effort using conventional, heavy-duty equipment during grading and trenching operations.

6.2.2 The soil encountered in our field investigation is considered to be both "non-expansive" (Expansion Index [EI] of 20 or less) and "expansive" (EI greater than 20) as defined by 2016 California Building Code (CBC) Section 1803.5.3. Table 6.2 presents soil classifications based on the expansion index.

TABLE 6.2
EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX

Expansion Index (EI)	Expansion Classification	2016 CBC Expansion Classification
0 – 20	Very Low	Non-Expansive
21 – 50	Low	Expansive
51 – 90	Medium	
91 – 130	High	
Greater Than 130	Very High	

6.2.3 We performed laboratory tests on samples of the site materials to evaluate the percentage of water-soluble sulfate content. Appendix B presents the results from the laboratory water-soluble sulfate content tests. The test results indicate that on-site materials at the locations tested possess "Not Applicable" and "S0" sulfate exposure to concrete structures, as defined by 2016 CBC Section 1904 and ACI 318-14 Chapter 19. The presence of water-soluble sulfates is not a visually discernible characteristic. Therefore, other soil samples from the site could yield different concentrations. Additionally, over time landscaping activities (i.e. addition of fertilizers and other soil nutrients) may affect the concentration.

6.2.4 Geocon Incorporated does not practice in the field of corrosion engineering. Therefore, if improvements that could be susceptible to corrosion are planned, further evaluation by a corrosion engineer may be needed.

6.3 Grading

6.3.1 All grading should be performed in accordance with the *Recommended Grading Specifications* contained in Appendix D. Where the recommendations of Appendix D conflict with this section of the report, the recommendations of this section take precedence.

6.3.2 Prior to commencing grading, a preconstruction conference should be held at the site with the owner or developer, grading contractor, civil engineer, and geotechnical engineer in attendance. Special soil handling and/or the grading plans can be discussed at that time.

6.3.3 Grading should be performed in conjunction with the observation and compaction testing services of Geocon Incorporated. Fill soil should be observed on a full-time basis during placement and tested to check in-place dry density and moisture content.

6.3.4 Site preparation should begin with removal of all deleterious material and vegetation. The depth of removal should be such that material exposed in cut areas or soil to be used for fill is relatively free of organic matter. Deleterious material generated during stripping and/or site demolition should be exported from the site.

6.3.5 Abandoned utilities should be removed and the subsequent depressions and/or trenches backfilled with properly compacted fill as part of the remedial grading.

6.3.6 Soft soils at the base of the existing detention basin should be removed to expose dense Terrace Deposits.

6.3.7 The undocumented fill, topsoil, and the clay portion of the Very Old Terrace Deposits are considered unsuitable to receive fill and settlement sensitive structures and should be completely removed to expose the underlying competent sandy Terrace Deposits. The depth of remedial grading is estimated to be 3 to 6 feet below existing grades. The estimated depth of the surficial soils that will require remedial grading is shown on the Geologic Map, Figure 2. The actual depth should be determined in the field during grading.

6.3.8 Selective grading should be performed so that expansive soils (EI greater than 90) are placed at least 3 feet below finish subgrade elevation. Alternatively, expansive soils can be mixed with low expansive, granular soil, and used as fill material in the upper 3 feet of pad grade provided the mixed soil has an expansion index (EI) less than 90. The contractor should expect to perform significant mixing to enable a uniform compacted fill that meets the required expansion index. As pad grades for the commercial portion are not yet known, consideration should be given to keeping expansive soils to a depth of at least 5 feet below planned sheet grade elevations in the commercial area to account for future pad regrading.

6.3.9 Because of the limited fill depths, mining of the underlying sandy cobble terrace will likely be needed to generate sufficient soil for either capping building pads or generating soil for mixing with the on-site clays.

6.3.10 Prior to placing fill, the upper 12 inches at the base of removals should be scarified, moisture conditioned as necessary and recompacted. Soils derived from onsite excavations are suitable for reuse as fill if free from vegetation, debris and other deleterious material. Fill lifts should be no thicker than will allow for adequate bonding and compaction. Fill, backfill, and scarified ground surfaces, should be compacted to a dry density of at least 90 percent of maximum dry density at or slightly above optimum moisture content, as determined in accordance with ASTM D 1557. Grading should be performed so that the upper 3 feet of soil below finish pad subgrade consist of soil with a *low* to *medium* expansive potential (EI of 90 or less).

6.3.11. Oversize rock greater than 12 inches should be placed at least 5 feet below finish pad grade or 3 feet below the deepest utility, whichever is greater. Rock greater than 6 inches should not be placed in the upper 3 feet below building pad grade. Oversize rock that cannot be placed as recommended should be exported off site.

6.3.12 Imported fill should consist of granular soil with a *low* expansion potential (EI of 50 or less) that is free of deleterious material or stones larger than 3 inches and should be compacted as recommended above. Geocon Incorporated should be notified of the import soil source and should perform laboratory testing prior to its arrival at the site to evaluate its suitability as fill material.

6.4 Slopes

6.4.1 A 2:1 (horizontal:vertical) or flatter fill slope with a maximum height of approximately 7 feet is planned along the eastern boundary of Street B. The outer 15 feet (or a distance equal to the height of the slope, whichever is less) should consist of properly compacted granular soil fill to reduce the potential for surface sloughing. All fill slopes should be track-walked upon completion such that the fill soils are uniformly compacted to at least 90 percent relative compaction to the face of the finish slope.

6.4.2 Fill slopes constructed with granular materials as recommended above will have a factor of safety of at least 1.5 under static conditions with respect to both deep-seated and surficial instability for the slope heights proposed.

6.4.3 All slopes should be planted, drained, and maintained to reduce erosion.

6.5 Seismic Design Criteria

6.5.1 We used USGS (2017) to determine seismic design criteria. Table 6.5.1 summarizes site-specific design criteria obtained from the 2016 California Building Code (CBC; Based on the

2015 International Building Code [IBC] and ASCE 7-10), Chapter 16 Structural Design, Section 1613 Earthquake Loads. The short spectral response uses a period of 0.2 second. The building structure and improvements should be designed using a Site Class D. We evaluated the Site Class in accordance with Section 1613.3.2 of the 2016 CBC and Table 20.3-1 of ASCE 7-10 based on our experience with the site subsurface soils and exploratory boring information. The values presented in Table 6.5.1 are for the risk-targeted maximum considered earthquake (MCE_R).

TABLE 6.5.1
2016 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2016 CBC Reference
Site Class	D	Table 1613.3.2
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	0.865g	Figure 1613..3.1(1)
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.328g	Figure 1613.3.1(2)
Site Coefficient, F_A	1.154	Table 1613.3.3(1)
Site Coefficient, F_V	1.743	Table 1613.3.3(2)
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	0.999g	Section 1613.3.3 (Eqn 16-37)
Site Class Modified MCE_R Spectral Response Acceleration – (1 sec), S_{M1}	0.572g	Section 1613.3.3 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	0.666g	Section 1613.3.4 (Eqn 16-39)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.382g	Section 1613.3.4 (Eqn 16-40)

6.5.2 Table 6.5.2 presents additional seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-10 for the mapped maximum considered geometric mean (MCE_G).

TABLE 6.5.2
2016 CBC SITE ACCELERATION DESIGN PARAMETERS

Parameter	Value	ASCE 7-10 Reference
Mapped MCE_G Peak Ground Acceleration, PGA	0.348g	Figure 22-7
Site Coefficient, F_{PGA}	1.152	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	0.401g	Section 11.8.3 (Eqn 11.8-1)

6.5.3 Conformance to the criteria in Tables 6.5.1 and 6.5.2 for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a maximum level earthquake occurs. The primary goal of seismic design is to protect life and not to avoid all damage, since such design may be economically prohibitive.

6.6 Foundation and Concrete Slabs-On-Grade Recommendations

6.6.1 The foundation recommendations herein are for proposed one- to three-story residential structures. The foundation recommendations have been separated into three categories based on either the maximum and differential fill thickness or Expansion Index. The foundation category criteria are presented in Table 6.6.1.

TABLE 6.6.1
FOUNDATION CATEGORY CRITERIA

Foundation Category	Maximum Fill Thickness, T (feet)	Differential Fill Thickness, D (feet)	Expansion Index (EI)
I	$T<20$	--	$EI \leq 50$
II	$20 \leq T<50$	$10 \leq D<20$	$50<EI \leq 90$
III	$T \geq 50$	$D \geq 20$	$90<EI \leq 130$

6.6.2 We will provide final foundation categories for each building or lot after finish pad grades have been achieved and we perform laboratory testing of the subgrade soil.

6.6.3 Table 6.6.2 presents minimum foundation and interior concrete slab design criteria for conventional foundation systems.

TABLE 6.6.2
CONVENTIONAL FOUNDATION RECOMMENDATIONS BY CATEGORY

Foundation Category	Minimum Footing Embedment Depth (inches)	Continuous Footing Reinforcement	Interior Slab Reinforcement
I	12	Two No. 4 bars, one top and one bottom	6 x 6 - 10/10 welded wire mesh at slab mid-point
II	18	Four No. 4 bars, two top and two bottom	No. 3 bars at 24 inches on center, both directions
III	24	Four No. 5 bars, two top and two bottom	No. 3 bars at 18 inches on center, both directions

6.6.4 The embedment depths presented in Table 6.6.2 should be measured from the lowest adjacent pad grade for both interior and exterior footings. The conventional foundations should have a minimum width of 12 inches and 24 inches for continuous and isolated footings, respectively. A typical footing dimension detail is provided on Figure 4.

6.6.5 The concrete slab-on-grade should be a minimum of 4 inches thick for Foundation Categories I and II and 5 inches thick for Foundation Category III.

6.6.6 Slabs that may receive moisture-sensitive floor coverings or may be used to store moisture-sensitive materials should be underlain by a vapor retarder. The vapor retarder design should be consistent with the guidelines presented in the American Concrete Institute's (ACI) *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (ACI 302.2R-06). The vapor retarder used should be specified by the project architect or developer based on the type of floor covering that will be installed and if the structure will possess a humidity-controlled environment.

6.6.7 The bedding sand thickness should be determined by the project foundation engineer, architect, and/or developer. However, we should be contacted to provide recommendations if the bedding sand is thicker than 6 inches. It is common to see 3 inches and 4 inches of sand below the concrete slab-on-grade for 5-inch and 4-inch thick slabs, respectively, in the southern California area.

6.6.8 The foundation design engineer should provide appropriate concrete mix design criteria and curing measures to assure proper curing of the slab by reducing the potential for rapid moisture loss and subsequent cracking and/or slab curl. We suggest that the foundation design engineer present the concrete mix design and proper curing methods on the foundation plans. It is critical that the foundation contractor understands and follows the recommendations presented on the foundation plans.

6.6.9 As an alternative to the conventional foundation recommendations, consideration should be given to the use of post-tensioned concrete slab and foundation systems for the support of the proposed structures. The post-tensioned systems should be designed by a structural engineer experienced in post-tensioned slab design and design criteria of the Post-Tensioning Institute (PTI) DC 10.5-12 *Standard Requirements for Design and Analysis of Shallow Post-Tensioned Concrete Foundations on Expansive Soils* or *WRI/CRSI Design of Slab-on-Ground Foundations*, as required by the 2016 California Building Code (CBC Section 1808.6.2). Although this procedure was developed for expansive soil conditions, it can also be used to reduce the potential for foundation distress due to differential fill settlement. The post-tensioned design should incorporate the geotechnical parameters presented in Table 6.6.3 for the particular Foundation Category designated. The parameters presented in Table 6.6.3 are based on the guidelines presented in the PTI DC 10.5 design manual.

TABLE 6.6.3
POST-TENSIONED FOUNDATION SYSTEM DESIGN PARAMETERS

Post-Tensioning Institute (PTI), Third Edition Design Parameters	Foundation Category		
	I	II	III
Thornthwaite Index	-20	-20	-20
Equilibrium Suction	3.9	3.9	3.9
Edge Lift Moisture Variation Distance, e_M (feet)	5.3	5.1	4.9
Edge Lift, y_M (inches)	0.61	1.10	1.58
Center Lift Moisture Variation Distance, e_M (feet)	9.0	9.0	9.0
Center Lift, y_M (inches)	0.30	0.47	0.66

6.6.10 The foundations for the post-tensioned slabs should be embedded in accordance with the recommendations of the structural engineer. If a post-tensioned mat foundation system is planned, the slab should possess a thickened edge with a minimum width of 12 inches and extend below the clean sand or crushed rock layer.

6.6.11 If the structural engineer proposes a post-tensioned foundation design method other than PTI DC 10.5:

- The deflection criteria presented in Table 6.6.3 are still applicable.
- Interior stiffener beams should be used for Foundation Categories II and III.
- The width of the perimeter foundations should be at least 12 inches.
- The perimeter footing embedment depths should be at least 12 inches, 18 inches and 24 inches for foundation categories I, II, and III, respectively. The embedment depths should be measured from the lowest adjacent pad grade.

6.6.12 Our experience indicates post-tensioned slabs may be susceptible to excessive edge lift, regardless of the underlying soil conditions. Placing reinforcing steel at the bottom of the perimeter footings and the interior stiffener beams may mitigate this potential. The structural engineer should design the foundation system to reduce the potential of edge lift occurring for the proposed structures.

6.6.13 During the construction of the post-tension foundation system, the concrete should be placed monolithically. Under no circumstances should cold joints form between the footings/grade beams and the slab during the construction of the post-tension foundation system unless designed by the structural engineer.

6.6.14 Category I, II, or III foundations may be designed for an allowable soil bearing pressure of 2,000 pounds per square foot (psf) (dead plus live load). This bearing pressure may be increased by one-third for transient loads due to wind or seismic forces. The estimated maximum total and differential settlement for the planned structures due to foundation loads is 1 inch and ½ inch, respectively.

6.6.15 Isolated footings outside of the slab area, if present, should have the minimum embedment depth and width recommended for conventional foundations for a particular Foundation Category. The use of isolated footings, which are located beyond the perimeter of the building and support structural elements connected to the building, are not recommended for Category III. Where this condition cannot be avoided, the isolated footings should be connected to the building foundation system with grade beams. In addition, consideration should be given to connecting patio slabs, which exceed 5 feet in width, to the building foundation to reduce the potential for future separation to occur.

6.6.16 Interior stiffening beams should be incorporated into the design of the foundation system in accordance with the PTI design procedures.

6.6.17 Special subgrade presaturation is not deemed necessary prior to placing concrete; however, the exposed foundation and slab subgrade soil should be moisture conditioned, as necessary, to maintain a moist condition as would be expected in any such concrete placement.

6.6.18 Where buildings or other improvements are planned near the top of a slope 3:1 (horizontal:vertical) or steeper, special foundation and/or design considerations are recommended due to the tendency for lateral soil movement to occur.

- For fill slopes less than 20 feet high or cut slopes regardless of height, footings should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope.

- When located next to a descending 3:1 (horizontal:vertical) fill slope or steeper, the foundations should be extended to a depth where the minimum horizontal distance is equal to H/3 (where H equals the vertical distance from the top of the fill slope to the base of the fill soil) with a minimum of 7 feet but need not exceed 40 feet. The horizontal distance is measured from the outer, deepest edge of the footing to the face of the slope. A post-tensioned slab and foundation system or mat foundation system can be used to reduce the potential for distress in the structures associated with strain softening and lateral fill extension. Specific design parameters or recommendations for either of these alternatives can be provided once the building location and fill slope geometry have been determined.

- If swimming pools are planned, Geocon Incorporated should be contacted for a review of specific site conditions.

- Swimming pools located within 7 feet of the top of cut or fill slopes are not recommended. Where such a condition cannot be avoided, the portion of the swimming pool wall within 7 feet of the slope face be designed assuming that the adjacent soil provides no lateral support. This recommendation applies to fill slopes up to 30 feet in height, and cut slopes regardless of height. For swimming pools located near the top of fill slopes greater than 30 feet in height, additional recommendations may be required and Geocon Incorporated should be contacted for a review of specific site conditions.

- Although other improvements, which are relatively rigid or brittle, such as concrete flatwork or masonry walls, may experience some distress if located near the top of a slope, it is generally not economical to mitigate this potential. It may be possible, however, to incorporate design measures which would permit some lateral soil movement without causing extensive distress. Geocon Incorporated should be consulted for specific recommendations.

6.6.19 The recommendations of this report are intended to reduce the potential for cracking of slabs and foundations due to expansive soil (if present), differential settlement of fill soil with varying thicknesses. However, even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade placed on such conditions may still exhibit some cracking due to soil movement and/or shrinkage. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be reduced 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.

6.6.20 Concrete slabs should be provided with adequate crack-control joints, construction joints and/or expansion joints to reduce unsightly shrinkage cracking. The design of joints should consider criteria of the American Concrete Institute (ACI) when establishing crack-control spacing. Additional steel reinforcing, concrete admixtures and/or closer crack control joint spacing should be considered where concrete-exposed finished floors are planned.

6.6.21 Geocon Incorporated should be consulted to provide additional design parameters as required by the structural engineer.

6.7 Retaining Walls

6.7.1 Retaining walls that are allowed to rotate more than 0.001H (where H equals the height of the retaining portion of the wall) and having a level backfill surface should be designed for an active soil pressure equivalent to the pressure exerted by a fluid density of 35 pounds per cubic foot (pcf). Where the backfill will be inclined at 2:1 (horizontal to vertical), an active soil pressure of 50 pcf is recommended. Soil with an expansion index (EI) of greater than 50 should not be used as backfill material behind retaining walls.

6.7.2 Where walls are restrained from movement at the top, an additional uniform pressure of 7H psf should be added to the active soil pressure for walls 10 feet high or less. The active pressure should be increased to 14H for the portion of the walls higher than 12 feet. For retaining walls subject to vehicular loads within a horizontal distance equal to two-thirds the wall height, a surcharge equivalent to 2 feet of fill soil should be added. Loads from the adjacent structures should be incorporated into the design of the retaining walls, if applicable.

6.7.3 The use of drainage openings through the base of the wall (weep holes) is not recommended where the seepage could be a nuisance or otherwise adversely affect the property adjacent to the base of the wall. The recommendations herein assume a properly compacted granular (EI of 50 or less) free-draining backfill material with no hydrostatic forces or imposed surcharge load. Figure 5 presents a typical retaining wall drain detail. If conditions different than those described are expected, or if specific drainage details are desired, Geocon Incorporated should be contacted for additional recommendations.

6.7.4 The structural engineer should determine the seismic design category for the project in accordance with Section 1613 of the 2016 CBC. If the project possesses a seismic design category of D, E, or F, retaining walls that support more than 6 feet of backfill should be designed with seismic lateral pressure in accordance with Section 18.3.5.12 of the 2016 CBC. The seismic load is dependent on the retained height where H is the height of the wall, in feet, and the calculated loads result in pounds per square foot (psf) exerted at the base of the wall and zero at the top of the wall. A seismic load of 20H should be used for design. We used the peak ground acceleration adjusted for Site Class effects, PGA_M, of 0.401g calculated from ASCE 7-10 Section 11.8.3 and applied a pseudo-static coefficient of 0.33.

6.7.5 The recommendations presented herein are generally applicable to the design of rigid concrete or masonry retaining walls having a maximum height of 15 feet. In the event that walls higher than 15 feet or other types of walls (such as crib-type walls) are planned, Geocon Incorporated should be consulted for additional recommendations.

6.7.6 Unrestrained walls will move laterally when backfilled and loading is applied. The amount of lateral deflection is dependent on the wall height, the type of soil used for backfill, and loads acting on the wall. The retaining walls and improvements above the retaining walls should be designed to incorporate an appropriate amount of lateral deflection as determined by the structural engineer.

6.8 Lateral Loading

6.8.1 For resistance to lateral loads, an allowable passive earth pressure equivalent to a fluid density of 300 pcf is recommended for footings or shear keys poured neat against properly compacted granular fill soils or undisturbed formation materials. The allowable passive pressure assumes a horizontal surface extending away from the base of the wall at least 5 feet or three times the surface generating the passive pressure, whichever is greater. The upper 12 inches of material not protected by floor slabs or pavement should not be included in the design for lateral resistance. Where walls are planned adjacent to and/or on descending slopes, a passive pressure of 150 pcf should be used in design.

6.8.2 If friction is to be used to resist lateral loads, an allowable coefficient of friction between soil and concrete of 0.4 should be used for design.

6.9 Storm Water Management

6.9.1 If storm water management devices are not properly designed and constructed, there is a risk for distress to improvements and properties located hydrologically down gradient or adjacent to these devices. Factors such as the amount of water being detained, its residence time, and soil permeability have an important effect on seepage transmission and the potential adverse impacts that may occur if the storm water management features are not properly designed and constructed. We have not performed a hydrogeological study at the site. If infiltration of storm water runoff into the subsurface occurs, downstream improvements may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other undesirable impacts as a result of water infiltration.

6.9.2 We performed an infiltration study on the property. A summary of our study and storm water management recommendations are provided in Appendix C. Based on the results of our study, infiltration is considered infeasible due to low infiltration rates.

6.10 Site Drainage and Moisture Protection

6.10.1 Adequate site drainage is critical to reduce the potential for differential soil movement, erosion and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to footings. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2016 CBC 1804.4 or other applicable standards. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices. Roof and pavement drainage should be directed into conduits that carry runoff away from the proposed or existing structures.

6.10.2 In the case of basement walls or building walls retaining landscaping areas, a water-proofing system should be used on the wall and joints, and a Miradrain drainage panel (or similar) should be placed over the waterproofing. The project architect or civil engineer should provide detailed specifications on the plans for all waterproofing and drainage.

6.10.3 Underground utilities should be leak free. Utility and irrigation lines should be checked periodically for leaks, and detected leaks should be repaired promptly. Detrimental soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.

6.10.4 Landscaping planters 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. Area drains to collect excess irrigation water and transmit it to drainage structures or impervious above-grade planter boxes can be used. In addition, where landscaping is planned adjacent to the pavement, construction of a cutoff wall along the edge of the pavement that extends at least 6 inches below the bottom of the base material should be considered.

6.11 Grading and Foundation Plan Review

6.11.1 Geocon Incorporated should review the grading and foundation plans for the project prior to final design submittal to determine if additional analysis and/or recommendations are required.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. 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.

2. 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 Incorporated 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 Incorporated.

3. This report is issued with the understanding that it is the responsibility of the owner or 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.

4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be 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.

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N

NO SCALE

VICINITY MAP

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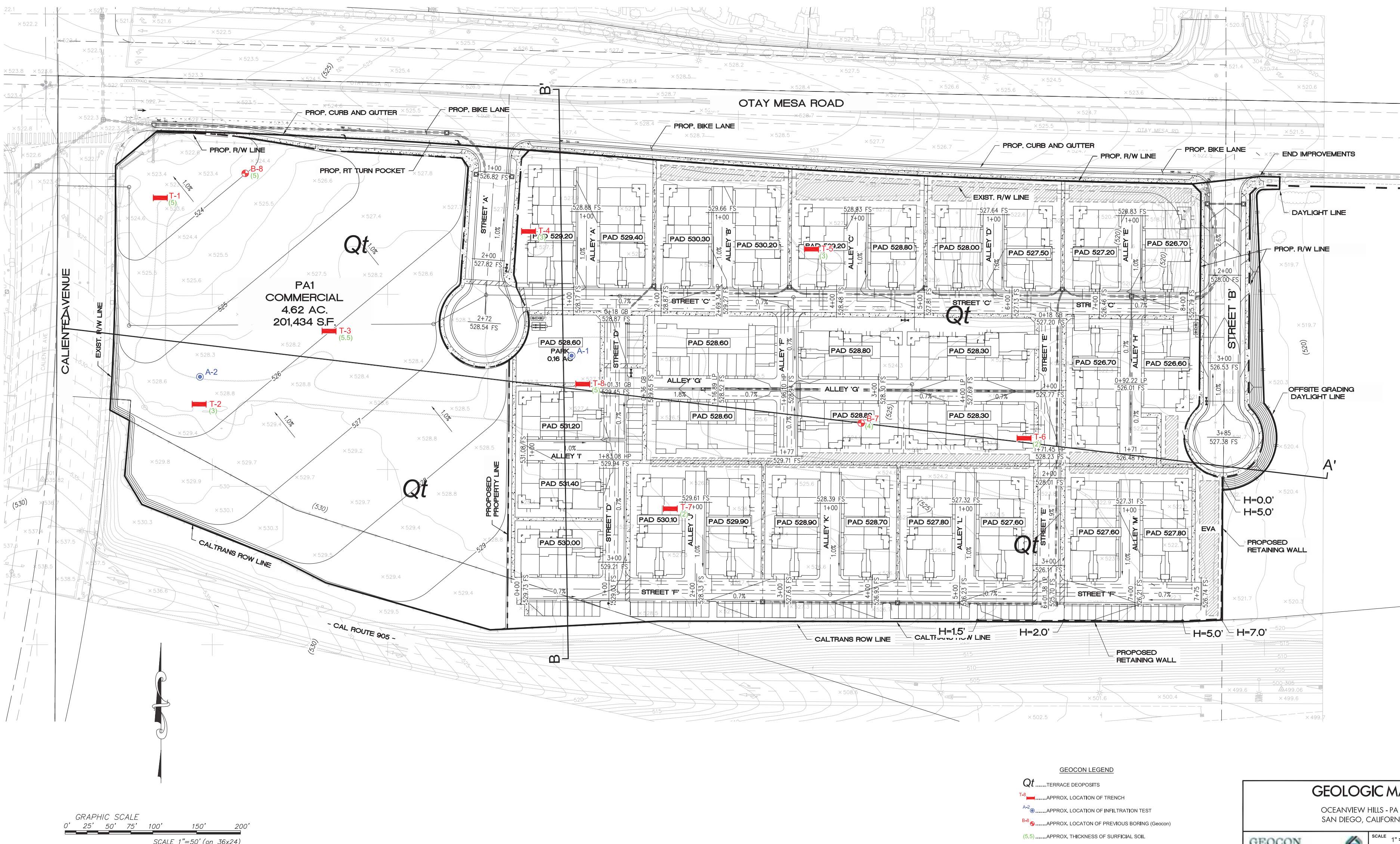
OCEANVIEW HILLS - PA 61
SAN DIEGO, CALIFORNIA

NB / RA		DSK/GTYPD	DATE 03 - 15 - 2018	PROJECT NO. 07955 - 42 - 02	FIG. 1

Plotted:03/14/2018 4:01PM \| By:JONATHAN WILKINS \| File Location:Y:\PROJECTS\07955-42-02 California Terraces\DETAILS\07955-42-02 VicinityMap.dwg



GEOCON LEGEND

Qt ....TERRACE DEOPOSITS

T-8 ....APPROX. LOCATION OF TRENCH

A-2 ....APPROX. LOCATION OF INFILTRATION TEST

B-8 ....APPROX. LOCATON OF PREVIOUS BORING (Geocon)

(5.5) ....APPROX. THICKNESS OF SURFICIAL SOIL

B B' ....APPROX. LOCATION OF GEOLOGIC CROSS SECTION

GEOLOGIC MAP

OCEANVIEW HILLS - PA 61
SAN DIEGO, CALIFORNIA

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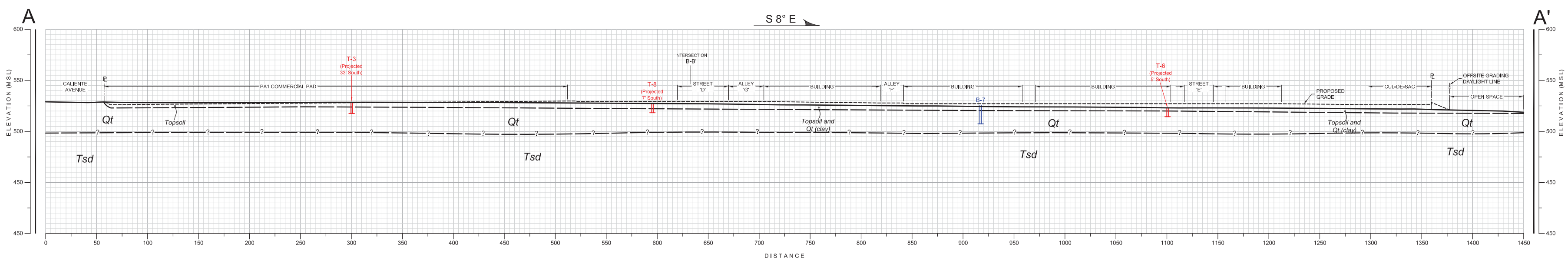
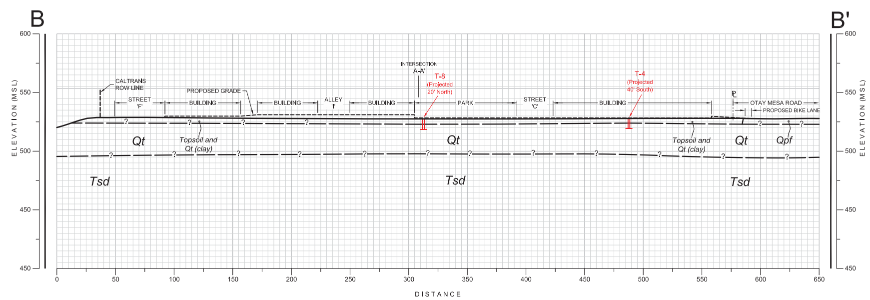
SCALE 1" = 50'	DATE 03 - 15 - 2018
PROJECT NO. 07955 - 42 - 02	FIGURE 2
SHEET 1 OF 1	



GEOLOGIC CROSS-SECTION A-A'

SCALE: 1" = 50' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION A-A'

SCALE: 1" = 50' (Vert. = Horiz.)

GEOCON LEGEND

Qpf ....PREVIOUSLY PLACED FILL

Qt ....TERRACE DEPOSITS

Tsd ....SAN DIEGO FORMATION

T-9 ....APPROX. LOCATION OF TRENCH

B-1 ....APPROX. LOCATON OF PREVIOUS BORING (Geocon)

?........APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOLOGIC CROSS SECTION

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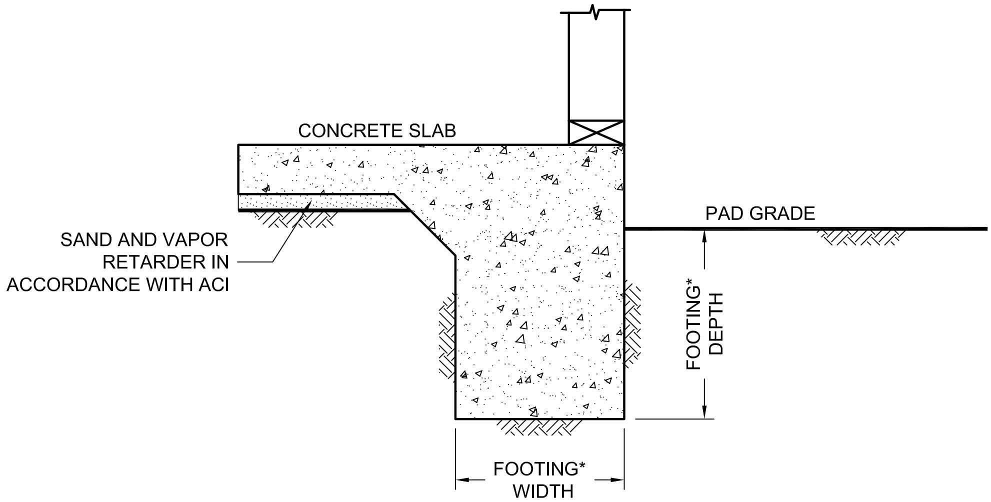
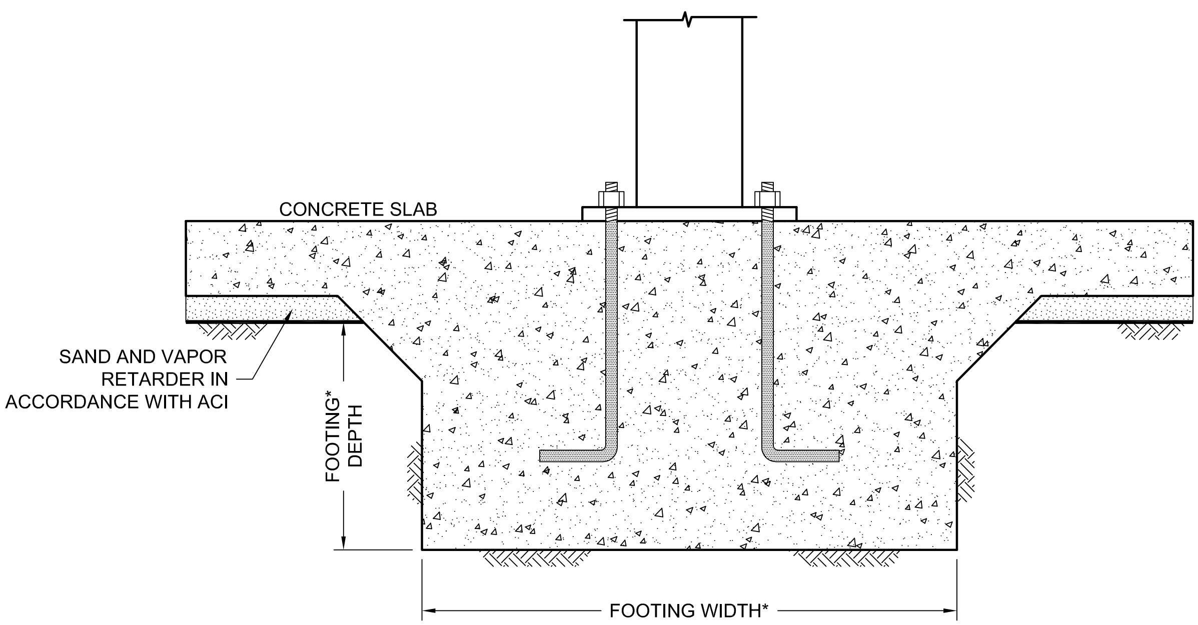
SCALE 1" = 50'	DATE 03 - 15 - 2018		
PROJECT NO. 07955 - 42 - 02		FIGURE 3	
SHEET 1 OF 1			





*....SEE REPORT FOR FOUNDATION WIDTH AND DEPTH RECOMMENDATION

NO SCALE

WALL / COLUMN FOOTING DIMENSION DETAIL

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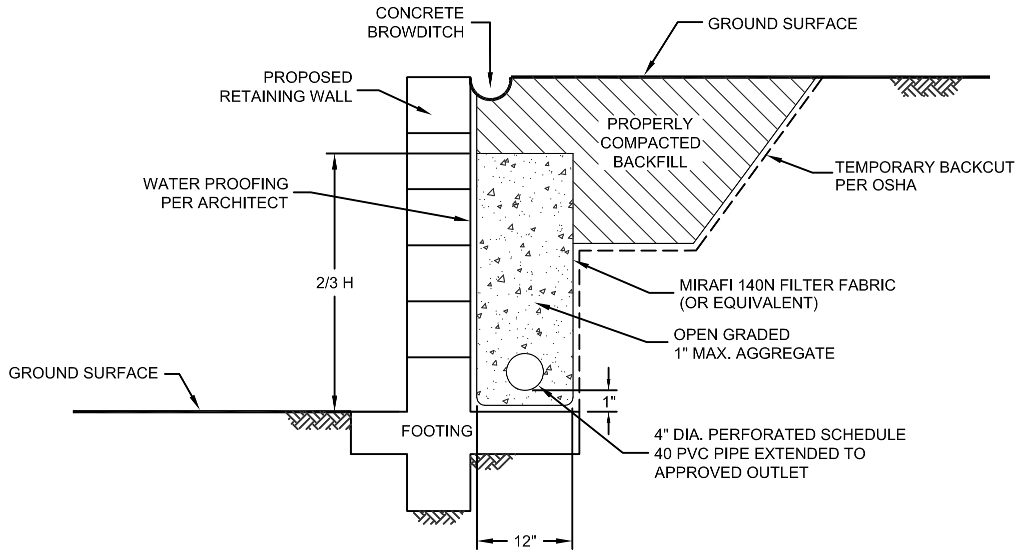
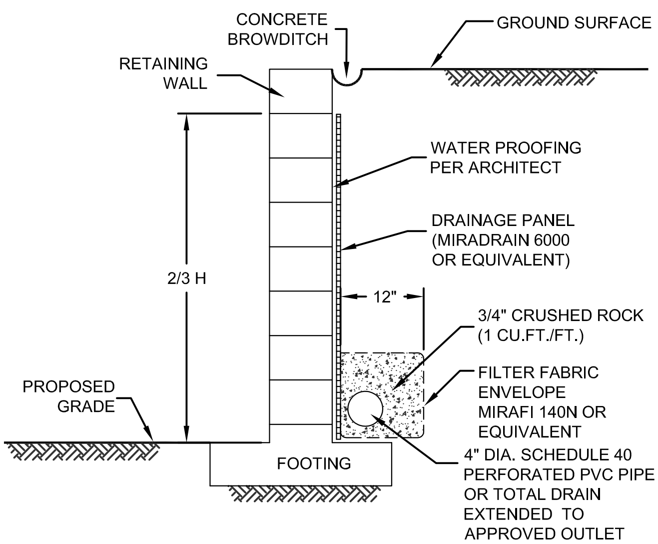
NB / RA		DSK/GTYPD	DATE 03 - 15 - 2018	PROJECT NO. 07955 - 42 - 02	FIG. 4

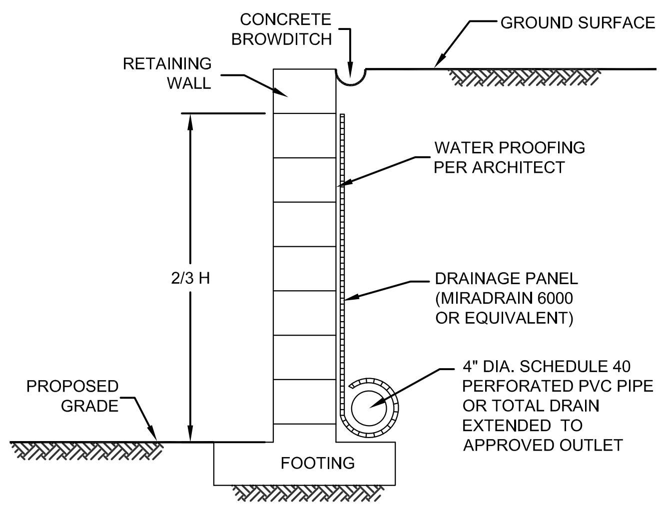
Plotted:03/14/2018 4:03PM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\07955-42-02 California Terraces\DETAILS\Wall-Column Footing Dimension Detail (COLFOOT2).dwg





NOTE :

DRAIN SHOULD BE UNIFORMLY SLOPED TO GRAVITY OUTLET
OR TO A SUMP WHERE WATER CAN BE REMOVED BY PUMPING



NO SCALE

TYPICAL RETAINING WALL DRAIN DETAIL

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SAN DIEGO, CALIFORNIA

NB / RA		DSK/GTYPD	DATE 03 - 15 - 2018	PROJECT NO. 07955 - 42 - 02	FIG. 5

Plotted:03/14/2018 4:04PM | By:JONATHAN WILKINS | File Location:Y:\PROJECTS\07955-42-02 California Terraces\DETAILS\Typical Retaining Wall Drainage Detail (RWDD7A).dwg

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

Fieldwork for our geotechnical investigation included a site visit, subsurface exploration, and soil sampling. The approximate locations of the exploratory trenches and borings are shown on the Geologic Map, Figure 2. The logs of trenches and borings are presented as figures following the text in this appendix. In addition, we performed 2, preliminary field-saturated infiltration tests.

We performed our exploratory trenching on December 22, 2017, and included excavating a with a John Deere rubber tire backhoe. We collected bulk samples of select soils and returned to the laboratory for testing. Borings were performed in 1984 for a previous investigation.

The soil conditions encountered in the borings were visually examined, classified and logged. Figures A-1 through A-8 present the logs of the exploratory trenches. The boring logs from our previous investigation are provided on Figures A-9 and A-10. The logs depict the various soil types encountered. The elevations shown on the logs are approximate elevations.

TRENCH T 1

ELEV. (MSL.) **523'** DATE COMPLETED **12-22-2017**

EQUIPMENT **JD 410 BACKHOE** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	T1-1			SC	**TOPSOIL** Loose, dry, dark brown, Clayey, fine to medium SAND; trace gravel			
2	T1-2			CL/CH	**VERY OLD TERRACE DEPOSITS (Qt)** Soft, damp, dark brown, Sandy to Silty CLAY; some white specs			
4	T1-3			SM	Dense, dry, mottled light brown and olive brown, Silty, fine to medium SANDSTONE			
6								
8					TRENCH TERMINATED AT 8 FEET No groundwater encountered			

Figure A-1,
Log of Trench T 1, Page 1 of 1

07955-42-02.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07955-42-02

TRENCH T 2

ELEV. (MSL.) **529'** DATE COMPLETED **12-22-2017**

EQUIPMENT **JD 410 BACKHOE** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**TOPSOIL** Soft, moist, dark brown, Sandy CLAY			
2								
4				SM/SC	**VERY OLD TERRACE DEPOSITS (Qt)** Medium dense to dense, damp, mottled light brown and olive brown, Silty to Clayey, fine to medium SAND			
6				SM	Very dense, damp, olive brown, Silty, fine to medium SANDSTONE			
8								
					TRENCH TERMINATED AT 9.5 FEET No groundwater encountered			

Figure A-2,
Log of Trench T 2, Page 1 of 1

07955-42-02.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

GEOCON

PROJECT NO. 07955-42-02

TRENCH T 3

ELEV. (MSL.) **528'** DATE COMPLETED **12-22-2017**

EQUIPMENT **JD 410 BACKHOE** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**TOPSOIL** Soft, moist, dark brown, Sandy CLAY			
2				CH	**VERY OLD TERRACE DEPOSITS (Qt)** Firm to stiff, moist, dark brown, Silty to Sandy CLAY; some white specs			
4				CL	Firm, damp, light brown and white, Sandy CLAY; porous			
6				SM	Dense, damp, light brown to olive brown, Silty, fine to medium SANDSTONE			
8								

TRENCH TERMINATED AT 9.5 FEET
No groundwater encountered

Figure A-3,
Log of Trench T 3, Page 1 of 1

07955-42-02.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07955-42-02

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 4 ELEV. (MSL.) 527' DATE COMPLETED 12-22-2017 EQUIPMENT JD 410 BACKHOE BY: N. BORJA	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0 – 2				CL	**TOPSOIL** Firm, damp, dark brown, Sandy CLAY; some white specs			
4 – 6	T4-1			SM	**VERY OLD TERRACE DEPOSITS (Qt)** Dense to very dense, damp, light brown to olive brown, Silty, fine to medium SANDSTONE			
					TRENCH TERMINATED AT 7 FEET No groundwater encountered			

Figure A-4,
Log of Trench T 4, Page 1 of 1

07955-42-02.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

TRENCH T 5

ELEV. (MSL.) **527'** DATE COMPLETED **12-22-2017**

EQUIPMENT **JD 410 BACKHOE** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SC/CL	**TOPSOIL** Loose, damp to moist, dark brown, fine to medium SAND to Sandy CLAY; little white specs			
2	T5-1			CL	**VERY OLD TERRACE DEPOSITS (Qt)** Medium dense, dry, mottled tan brown, light brown and white, Sandy CLAY			
4								
6				SM	Dense, dry to damp, light brown and olive brown, Silty, fine to medium SANDSTONE			

TRENCH TERMINATED AT 7 FEET
No groundwater encountered

Figure A-5,
Log of Trench T 5, Page 1 of 1

07955-42-02.GPJ

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07955-42-02

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 6** ELEV. (MSL.) **523'** DATE COMPLETED **12-22-2017** EQUIPMENT **JD 410 BACKHOE** BY: **N. BORJA**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				CL	**TOPSOIL** Firm, dry, dark brown, Sandy CLAY; little rootlets			
2				SM	**VERY OLD TERRACE DEPOSITS (Qt)** Dense, dry, yellowish brown, Silty, fine to medium SANDSTONE			
4					-Becomes gravelly with cobble up to 8" diameter below 4 feet			
6								
					TRENCH TERMINATED AT 7 FEET No groundwater encountered			

Figure A-6,
Log of Trench T 6, Page 1 of 1

07955-42-02.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07955-42-02

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 7 ELEV. (MSL.) 524' DATE COMPLETED 12-22-2017 EQUIPMENT JD 410 BACKHOE BY: N. BORJA	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				CL	**TOPSOIL** Soft, damp, dark brown, Sandy CLAY; some white specs			
2				SM	**VERY OLD TERRACE DEPOSITS (Qt)** Dense, damp, olive brown to brown, Silty, fine to medium SANDSTONE			
4					-Becomes tan brown			
6					-Becomes light yellowish brown to light gray			
					TRENCH TERMINATED AT 7 FEET No groundwater encountered			

Figure A-7,
Log of Trench T 7, Page 1 of 1

07955-42-02.GPJ

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07955-42-02

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 8 ELEV. (MSL.) 527' DATE COMPLETED 12-22-2017 EQUIPMENT JD 410 BACKHOE BY: N. BORJA	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				CL	**TOPSOIL** Soft to firm, moist, dark brown, Sandy CLAY			
2				CH	**VERY OLD TERRACE DEPOSITS (Qt)** Soft, damp, dark brown, CLAY			
4								
				SM	Dense, damp, brown to olive brown, Silty, fine to medium SANDSTONE			
6								
				SM/SP-SM	Medium dense to dense, moist, mottled reddish brown to brown, fine to coarse SAND; some silt			
8								
					TRENCH TERMINATED AT 9 FEET No groundwater encountered			

Figure A-8,
Log of Trench T 8, Page 1 of 1

07955-42-02.GPJ

SAMPLE SYMBOLS	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

File No. D-3117-J01
May 14, 1984

DEPTH IN FEET	SAMPLE NUMBER	LOG & LOCATION OF SAMPLE	Penetration Resistance Blows/ft	DESCRIPTION	IN-PLACE DRY DENSITY p.c.f	IN-PLACE MOISTURE CONTENT % dry wt
				BORING 7		
0				TOPSOIL Stiff, very moist, dark gray-brown, Sandy CLAY with occasional cobbles		
2	7-1		3			
4				TERRACE DEPOSITS Medium dense, moist, light yellow-brown/orange mottled, slightly Clayey, very fine to fine SAND/SILT		
6	7-2		13			
	7-3					
8						
				Medium dense, moist, yellow-brown, slightly Clayey Sandy GRAVEL to 12" diameter		
10						
12						
14						
				difficult drilling		
16						
				BORING TERMINATED AT 17.0 FEET		
18						

Figure A-9, Log of Test Boring 7

File No. D-3117-J01
May 14, 1984

DEPTH IN FEET	SAMPLE NUMBER	LOG & LOCATION OF SAMPLE	Penetration Resistance Blows/ft	DESCRIPTION	IN-PLACE DRY DENSITY p.c.f	IN-PLACE MOISTURE CONTENT % dry wt
				BORING 8		
0				TOPSOIL Stiff, very moist, dark red-brown, Sandy CLAY with minor caliche		
2				TERRACE DEPOSITS Medium dense, humid, light brown, slightly Clayey, very fine to fine SAND/SILT with caliche nodules to 2" dia.		
4						
6						
8				Medium loose, moist, light yellow-brown, Silty Sandy GRAVEL to 6" diameter, very friable		
10				becomes light brown, humid		
12				hole caving		
14						
16				BORING TERMINATED AT 15.0 FEET SEVERE CAVING		

Figure A-10, Log of Test Boring 8

APPENDIX B

APPENDIX B

LABORATORY TESTING

We performed laboratory tests in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. We tested selected samples for maximum dry density and optimum moisture content, direct shear, expansion, water-soluble sulfate characteristics, and gradation. The results of our laboratory tests are presented on the following tables and graph.

TABLE B-I
SUMMARY OF LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT TEST RESULTS
ASTM D 1557

Proctor Curve No.	Source and Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
T1-2	Dark brown, silty CLAY	115.6	15.1
T4-1	Light brown, Clayey, fine to coarse SAND; trace gravel	118.4	13.8

TABLE B-II
SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS
ASTM D 3080

Sample No.	Dry Density (pcf)	Moisture Content (%)		Unit Cohesion (psf)	Angle of Shear Resistance (degrees)
		Initial	Final		
*T4-1	106.8	13.4	21.3	450	28

*Sample remolded to 90% of the maximum dry density and optimum moisture content.

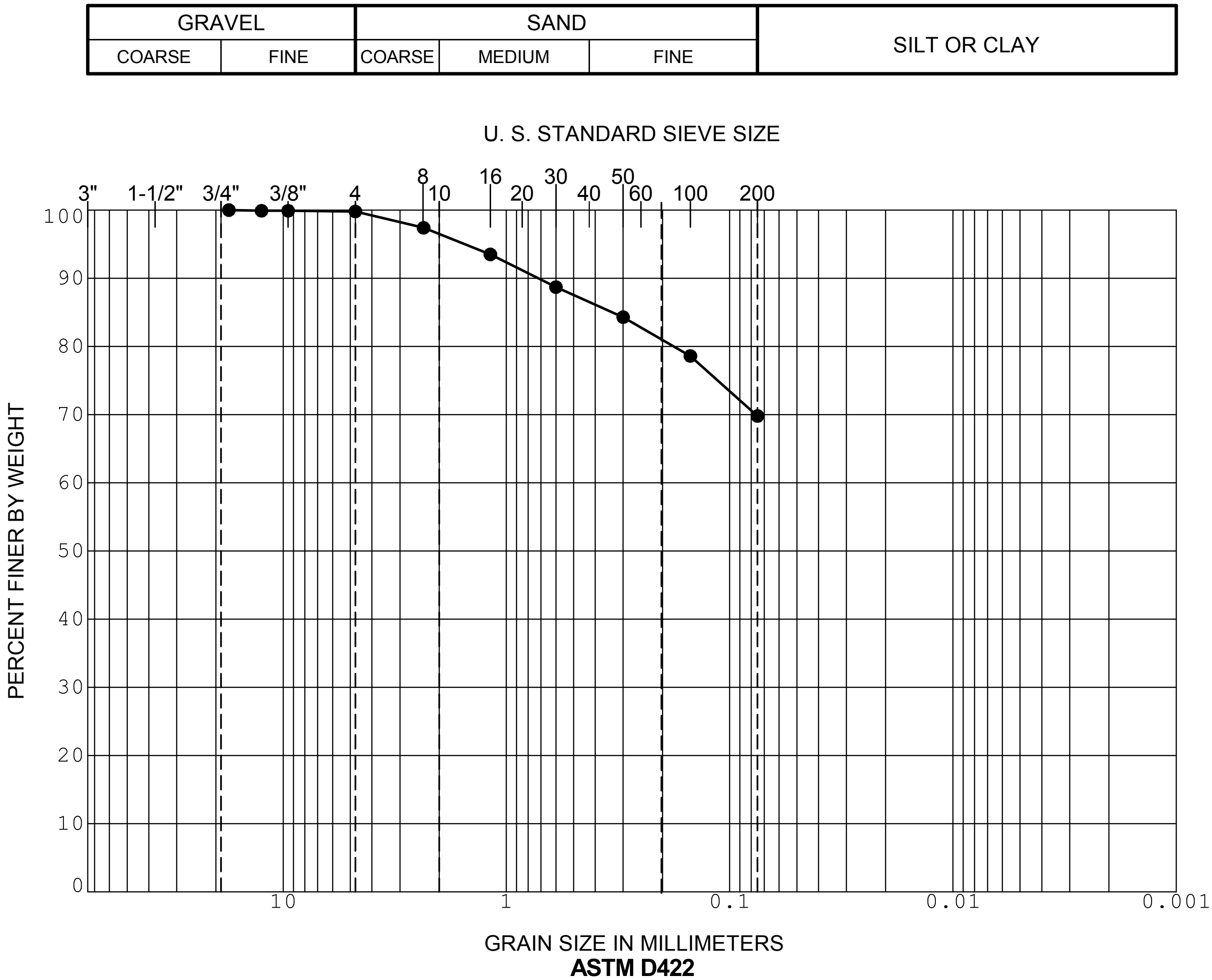
TABLE B-III
SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS
ASTM D 4829

Sample No.	Moisture Content (%)		Dry Density (pcf)	Expansion Index	Expansion Classification
	Before Test	After Test			
T1-2	13.7	34.1	95.5	99	High
T4-1	10.6	23.3	107.7	52	Medium
T5-1	16.5	27.5	89.7	7	Very Low

TABLE B-IV
SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS
CALIFORNIA TEST NO. 417

Sample No.	Water-Soluble Sulfate (%)	Classification
T1-2	0.040	Not Applicable (S0)
T4-1	0.058	Not Applicable (S0)
T5-1	0.079	Not Applicable (S0)

PROJECT NO. 07955-42-02



	SAMPLE	DEPTH (ft)	CLASSIFICATION	NAT WC	LL	PL	PI
●	T5-1	2.5	CL - Sandy, lean CLAY				
⊠							
▲							

GRADATION CURVE

OCEANVIEW HILLS PA 61

SAN DIEGO, CALIFORNIA

07955-42-02.GPJ

Figure B-1

GEOCON

APPENDIX C

APPENDIX C

STORM WATER MANAGEMENT INVESTIGATION

We expect storm water management devices will be utilized on the project in accordance with the *2017 City of San Diego Storm Water Standards* (SWS). If not properly constructed, there is a potential for distress to improvements and properties located hydrologically down gradient or adjacent to these devices. Factors such as the amount of water to be detained, its residence time, and soil permeability have an important effect on seepage transmission and the potential adverse impacts that may occur if the storm water management features are not properly designed and constructed. We have not performed a hydrogeological study at the site. If infiltration of storm water runoff occurs, downstream properties may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other undesirable impacts as a result of water infiltration.

Hydrologic Soil Group

The United States Department of Agriculture (USDA), Natural Resources Conservation Services, possesses general information regarding the existing soil conditions for areas within the United States. The USDA website also provides the Hydrologic Soil Group. Table C-1 presents the descriptions of the hydrologic soil groups.

TABLE C-1
HYDROLOGIC SOIL GROUP DEFINITIONS

Soil Group	Soil Group Definition
A	Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
B	Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
C	Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
D	Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high-water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The property is classified as Soil Group D. Table C-2 presents the information from the USDA website for the subject property.

TABLE C-2
USDA WEB SOIL SURVEY – HYDROLOGIC SOIL GROUP

Map Unit Name	Map Unit Symbol	Approximate Percentage of Property	Hydrologic Soil Group	k_{SAT} of Most Limiting Layer (inches/ hour)
Stockpen gravelly clay loam, 2 to 5 percent slopes	SuB	100	D	0.00 to 0.06

In-Situ Testing

We performed 2 field-saturated, hydraulic conductivity tests at the site using a Soil Moisture Corp Aardvark Permeameter at the locations presented on the Geologic Map, Figure 2. The borings were excavated with a 4-inch-diameter hand auger. Table C-3 presents the results of the saturated hydraulic conductivity testing. Test data is presented on the attached figures in this Appendix.

We used the guidelines presented in the Riverside County Low Impact Development BMP Design Handbook which references the United States Bureau of Reclamation Well Permeameter Test Method (USBR 7300-89). Based on this widely accepted guideline, the saturated hydraulic conductivity (Ksat) is equal to the infiltration rate. Therefore, the Ksat value determined from the Aardvark Permeameter test is the unfactored infiltration rate. The Ksat (infiltration rate) equation provided in the Riverside County Handbook was used to compute the unfactored infiltration rate.

TABLE C-3
UNFACTORED, FIELD-SATURATED, INFILTRATION TEST RESULTS
USING THE SOILMOISTURE CORP AARDVARK PERMEAMETER

Test No.	Depth (inches)	Geologic Unit	Field Infiltration Rate, I (in/hr)	Factored* Field Infiltration Rate, I (in/hr)
A-1	45	Terrace Deposits	0.002	0.001
A-2	48	Terrace Deposits	0.068	0.034

*Factor of Safety of 2.0 for feasibility determination.

Soil permeability values from in-situ tests can vary significantly from one location to another due to the non-homogeneous characteristics inherent to most soil. However, if a sufficient amount of field and laboratory test data is obtained, a general trend of soil permeability can usually be evaluated. For this project and for storm water purposes, the test results presented herein should be considered approximate values.

Infiltration categories include full infiltration, partial infiltration and no infiltration. Table C-4 presents the commonly accepted definitions of the potential infiltration categories based on the infiltration rates.

TABLE C-4
INFILTRATION CATEGORIES

Infiltration Category	Field Infiltration Rate, I (inches/hour)	Factored Infiltration Rate*, I (inches/hour)
Full Infiltration	I > 1.0	I > 0.5
Partial Infiltration	0.10 < I ≤ 1.0	0.05 < I ≤ 0.5
No Infiltration (Infeasible)	I < 0.10	I < 0.05

*Using a Factor of Safety of 2.

STORM WATER MANAGEMENT CONCLUSIONS

Soil Types

Very Old Terrace Deposits (Qt) – Very Old Terrace Deposits underlies the topsoils. The Terrace Deposits consist of an upper clay layer and a lower sandy cobbly layer. Infiltration tests within this unit typically exhibit very slow infiltration characteristics due to its dense condition. Therefore, full and partial infiltration should be considered infeasible.

Groundwater Elevations

We did not encounter groundwater during our field exploration. The site is at an elevation of about 520 to 530 feet MSL. We expect groundwater to be at elevations greater than 50 feet below the existing ground surface.

Soil or Groundwater Contamination

We are unaware of contaminated soil or groundwater contamination on the property. Therefore, infiltration associated with this risk is considered feasible.

New or Existing Utilities

Utilities are located adjacent to the property within the existing streets. However, we don't expect infiltration will impact existing utilities based on the location of the proposed basins. The location of BMPs to proposed new utilities is unknown.

Existing and Planned Structures

Water should not be allowed to infiltrate in areas where it could affect the neighboring properties and existing adjacent structures, improvements and roadway. Mitigation for existing structures consists of not allowing water infiltration within a lateral distance of at least 15 feet from the new or existing foundations.

Storm Water Conclusions

The planned development will consist of the construction a multi-family apartment buildings and commercial buildings and improvements. The property is underlain by dense very old Terrace Deposits. We expect 2 to 7 feet of fill will be placed across the site. In addition, remedial removals of 2 to 6 feet are expected. At the completion of grading, we expect the site will be underlain by approximately 5 to 10 feet of compacted fill overlying Very Old Terrace Deposits.

Due to the very slow infiltration characteristics of the Very Old Terrace Deposits and the presence of compacted fill, infiltration is considered infeasible.

Storm Water Management Devices

Liners and subdrains should be incorporated into the design and construction of the planned storm water devices. The liners should be impermeable (e.g. High-density polyethylene, HDPE, with a thickness of about 30 mil or equivalent Polyvinyl Chloride**,** PVC) to prevent water migration. The subdrains should be perforated within the liner area, installed at the base and above the liner, be at least 3 inches in diameter and consist of Schedule 40 PVC pipe. The subdrains outside of the liner should consist of solid pipe. The penetration of the liners at the subdrains should be properly waterproofed. The subdrains should be connected to a proper outlet. The devices should also be installed in accordance with the manufacturer's recommendations.

Storm Water Standard Worksheets

The SWS requests the geotechnical engineer complete the *Categorization of Infiltration Feasibility Condition* (Worksheet C.4-1 or I-8) worksheet information to help evaluate the potential for infiltration on the property. The attached Worksheet C.4-1 presents the completed information for the submittal process.

The regional storm water standards also have a worksheet (Worksheet D.5-1 or Form I-9) that helps the project civil engineer estimate the factor of safety based on several factors. Table C-5 describes the suitability assessment input parameters related to the geotechnical engineering aspects for the factor of safety determination.

TABLE C-5
SUITABILITY ASSESSMENT RELATED CONSIDERATIONS FOR INFILTRATION FACILITY SAFETY FACTORS

Consideration	High Concern – 3 Points	Medium Concern – 2 Points	Low Concern – 1 Point
Assessment Methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates. Use of well permeameter or borehole methods without accompanying continuous boring log. Relatively sparse testing with direct infiltration methods	Use of well permeameter or borehole methods with accompanying continuous boring log. Direct measurement of infiltration area with localized infiltration measurement methods (e.g., infiltrometer). Moderate spatial resolution	Direct measurement with localized (i.e. small-scale) infiltration testing methods at relatively high resolution or use of extensive test pit infiltration measurement methods.
Predominant Soil Texture	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site Soil Variability	Highly variable soils indicated from site assessment or unknown variability	Soil boring/test pits indicate moderately homogenous soils	Soil boring/test pits indicate relatively homogenous soils
Depth to Groundwater/ Impervious Layer	<5 feet below facility bottom	5-15 feet below facility bottom	>15 feet below facility bottom

Based on our geotechnical investigation and the previous table, Table C-6 presents the estimated factor values for the evaluation of the factor of safety. This table only presents the suitability assessment safety factor (Part A) of the worksheet. The project civil engineer should evaluate the safety factor for design (Part B) and use the combined safety factor for the design infiltration rate.

TABLE C-6
FACTOR OF SAFETY WORKSHEET DESIGN VALUES – PART A[1]

Suitability Assessment Factor Category	Assigned Weight (w)	Factor Value (v)	Product (p = w x v)
Assessment Methods	0.25	2	0.50
Predominant Soil Texture	0.25	3	0.75
Site Soil Variability	0.25	2	0.50
Depth to Groundwater/ Impervious Layer	0.25	1	0.25
Suitability Assessment Safety Factor, $S_A = \Sigma p$			2.00

[1]The project civil engineer should complete Worksheet D.5-1 or Form I-9 using the data on this table. Additional information is required to evaluate the design factor of safety.

<table>
<tr><th colspan="2">Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions</th><th>Worksheet C.4-1: Form I-8A[10]</th></tr>
<tr><td colspan="3">Part 1 - Full Infiltration Feasibility Screening Criteria</td></tr>
<tr><td colspan="2">DMA(s) Being Analyzed:</td><td>Project Phase:</td></tr>
<tr><td colspan="2">Project Site</td><td></td></tr>
<tr><td colspan="3">Criteria 1: Infiltration Rate Screening</td></tr>
<tr><td>1A</td><td colspan="2">Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[11]?
☐Yes; the DMA may feasibly support full infiltration. Answer “Yes” to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing.
☐No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B).
☐No; the mapped soil types are C, D, or “urban/unclassified” and is corroborated by available site soil data. Answer “No” to Criteria 1 Result.
☑No; the mapped soil types are C, D, or “urban/unclassified” but is not corroborated by available site soil data (continue to Step 1B).</td></tr>
<tr><td>1B</td><td colspan="2">Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1?
☐Yes; Continue to Step 1C.
☐No; Skip to Step 1D.</td></tr>
<tr><td>1C</td><td colspan="2">Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1 greater than 0.5 inches per hour?
☐Yes; the DMA may feasibly support full infiltration. Answer “Yes” to Criteria 1 Result.
☐No; full infiltration is not required. Answer “No” to Criteria 1 Result.</td></tr>
<tr><td>1D</td><td colspan="2">Infiltration Testing Method. Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation.
☐Yes; continue to Step 1E.
☐No; select an appropriate infiltration testing method.</td></tr>
</table>

Note that it is not required to investigate each and every criterion in the worksheet, a single “no” answer in Part 1, Part 2, Part 3, or Part 4 determines a full, partial, or no infiltration condition.

[10] This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design.

[11] Available data includes site-specific sampling or observation of soil types or texture classes, such as obtained from borings or test pits necessary to support other design elements.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[10]
1E	**Number of Percolation/Infiltration Tests.** Does the infiltration testing method performed satisfy the minimum number of tests specified in Table D.3-2? ☐Yes; continue to Step 1F. ☐No; conduct appropriate number of tests.
IF	**Factor of Safety.** Is the suitable Factor of Safety selected for full infiltration design? See guidance in D.5; Tables D.5-1 and D.5-2; and Worksheet D.5-1 (Form I-9). ☐Yes; continue to Step 1G. ☐No; select appropriate factor of safety.
1G	**Full Infiltration Feasibility.** Is the average measured infiltration rate divided by the Factor of Safety greater than 0.5 inches per hour? ☐Yes; answer "Yes" to Criteria 1 Result. ☐No; answer "No" to Criteria 1 Result.
Criteria 1 Result	Is the estimated reliable infiltration rate greater than 0.5 inches per hour within the DMA where runoff can reasonably be routed to a BMP? ☐Yes; the DMA may feasibly support full infiltration. Continue to Criteria 2. ☐No; full infiltration is not required. Skip to Part 1 Result.
Summarize infiltration testing methods, testing locations, replicates, and results and summarize estimates of reliable infiltration rates according to procedures outlined in D.5. Documentation should be included in project geotechnical report. We performed field-saturated, hydraulic conductivity tests, A-1 and A-2, using a Soil Moisture Corp Aardvark Permeameter (see Geologic Map, Figure 2). The test holes were hand excavated using 4-inch diameter hand augers. The unfactored test results of the saturated hydraulic conductivity testing for A-1 is 0.002 in/hr and 0.068 in/hr for A-2. Factored rates are 0.001 and 0.034 in/hr using a factor of 2.0.	

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions			Worksheet C.4-1: Form I-8A[10]	
Criteria 2: Geologic/Geotechnical Screening				
2A	If all questions in Step 2A are answered "Yes," continue to Step 2B. For any "No" answer in Step 2A answer "No" to Criteria 2, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.			
2A-1	Can the proposed full infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick below the infiltrating surface?	☐Yes	☐No	
2A-2	Can the proposed full infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐Yes	☐No	
2A-3	Can the proposed full infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐Yes	☐No	
2B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1. If all questions in Step 2B are answered "Yes," then answer "Yes" to Criteria 2 Result. If there are "No" answers continue to Step 2C.			
2B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can full infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐Yes	☐No	
2B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can full infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐Yes	☐No	

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
2B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011 or most recent edition). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can full infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐Yes	☐No
2B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can full infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐Yes	☐No
2B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can full infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐Yes	☐No
2B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can full infiltration BMPs be proposed within the DMA using established setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
2C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 2B. Provide a discussion of geologic/geotechnical hazards that would prevent full infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for full infiltration BMPs? If the question in Step 2 is answered "Yes," then answer "Yes" to Criteria 2 Result. If the question in Step 2C is answered "No," then answer "No" to Criteria 2 Result.	☐Yes	☐No
Criteria 2 Result	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐Yes	☐No

Summarize findings and basis; provide references to related reports or exhibits.

Part 1 Result – Full Infiltration Geotechnical Screening [12]	Result
If answers to both Criteria 1 and Criteria 2 are "Yes", a full infiltration design is potentially feasible based on Geotechnical conditions only. If either answer to Criteria 1 or Criteria 2 is "No", a full infiltration design is not required.	☐Full infiltration Condition ☐Complete Part 2

[12] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		Project Phase:
Project Site		
Criteria 3 : Infiltration Rate Screening		
3A	**NRCS Type C, D, or "urban/unclassified":** Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or "urban/unclassified" and corroborated by available site soil data? ☐ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☐ Yes; the site is mapped as D soils or "urban/unclassified" and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☑ No; infiltration testing is conducted (refer to Table D.3-1), continue to Step 3B.	
3B	**Infiltration Testing Result:** Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr? ☐ Yes; the site may support partial infiltration. Answer "Yes" to Criteria 3 Result. ☐ No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer "No" to Criteria 3 Result.	
Criteria 3 Result	Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP? ☐ Yes; Continue to Criteria 4. ☐ No: Skip to Part 2 Result.	
Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate). We performed field-saturated, hydraulic conductivity tests, A-1 and A-2, using a Soil Moisture Corp Aardvark Permeameter (see Geologic Map, Figure 2). The test holes were hand excavated using 4-inch diameter hand augers. The unfactored test results of the saturated hydraulic conductivity testing for A-1 is 0.002 in/hr and 0.068 in/hr for A-2. Factored rates are 0.001 and 0.034 in/hr using a factor of 2.0. Test results indicate infiltration rates less than 0.05 in/hr and are not high enough to support infiltration.		

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 4: Geologic/Geotechnical Screening			
4A	If all questions in Step 4A are answered "Yes," continue to Step 2B. For any "No" answer in Step 4A answer "No" to Criteria 4 Result, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
4A-1	Can the proposed partial infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick?	☐Yes	☐No
4A-2	Can the proposed partial infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐Yes	☐No
4A-3	Can the proposed partial infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐Yes	☐No
4B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1 If all questions in Step 4B are answered "Yes," then answer "Yes" to Criteria 4 Result. If there are any "No" answers continue to Step 4C.		
4B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can partial infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐Yes	☐No
4B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can partial infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐Yes	☐No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
4B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can partial infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐Yes	☐No
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐Yes	☐No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐Yes	☐No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	☐Yes	☐No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	☐Yes	☐No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No
Summarize findings and basis; provide references to related reports or exhibits.			

Part 2 – Partial Infiltration Geotechnical Screening Result[13]	Result
If answers to both Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site.	☐ Partial Infiltration Condition ☑ No Infiltration Condition

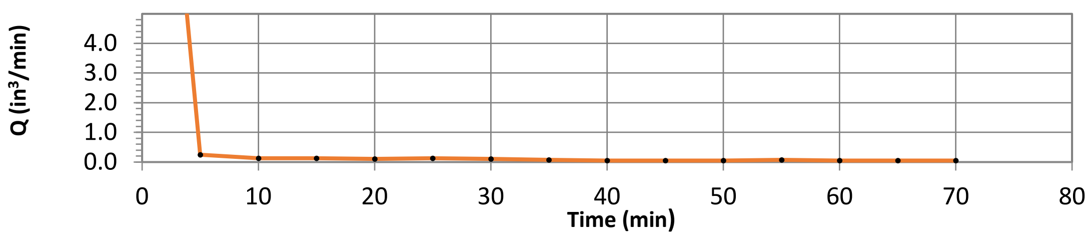
[13] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Aardvark Permeameter Data Analysis

Project Name:	CAL TERRACES - PA 61	Date:	12/22/2017
Project Number:	07955-42-02	By:	N. BORJA
Test Number:	A-1		

Borehole Diameter, d (in.):	4.00	Ref. EL (feet, MSL):	528.5
Borehole Depth, **H** (in):	45.00	Bottom EL (feet, MSL):	524.8
		Head Height Measured, **h** (in.):	5.50

Reading	Time Elapsed (min)	Water Weight Consummed (lbs)	Water Volume Consummed (in^3)	Q (in^3/min)
1	0.00	0.000	0.00	0.00
2	5.00	3.785	104.82	20.963
3	5.00	0.045	1.25	0.249
4	5.00	0.025	0.69	0.138
5	5.00	0.025	0.69	0.138
6	5.00	0.020	0.55	0.111
7	5.00	0.025	0.69	0.138
8	5.00	0.020	0.55	0.111
9	5.00	0.015	0.42	0.083
10	5.00	0.010	0.28	0.055
11	5.00	0.010	0.28	0.055
12	5.00	0.010	0.28	0.055
13	5.00	0.015	0.42	0.083
14	5.00	0.010	0.28	0.055
15	5.00	0.010	0.28	0.055
16	5.00	0.010	0.28	0.055
			Steady Flow Rate, Q (in^3/min):	0.055



Field-Saturated Hydraulic Conductivity (Infiltration Rate)

K_{sat} = 3.86E-05 in/min 0.002 in/hr

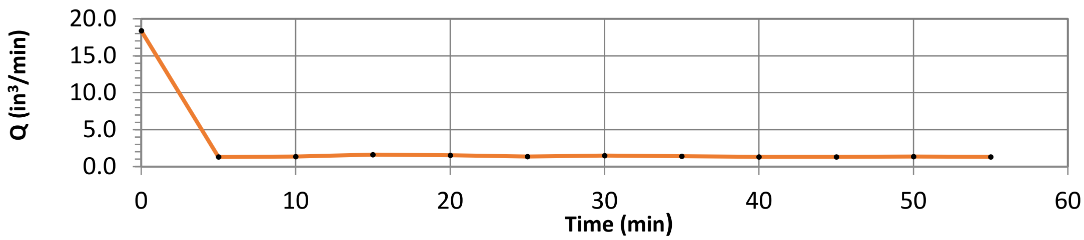
GEOCON

Aardvark Permeameter Data Analysis

Project Name:	CAL TERRACES - PA 61	Date:	12/22/2017
Project Number:	07955-42-02	By:	N. BORJA
Test Number:	A-2	Ref. EL (feet, MSL):	529.5
		Bottom EL (feet, MSL):	525.5

Borehole Diameter, d (in.): 4.00
Borehole Depth, **H** (in): 48.00
Head Height Measured, **h** (in.): 3.75

Reading	Time Elapsed (min)	Water Weight Consummed (lbs)	Water Volume Consummed (in^3)	Q (in^3/min)
1	0.00	0.000	0.00	0.00
2	5.00	3.320	91.94	18.388
3	5.00	0.235	6.51	1.302
4	5.00	0.245	6.78	1.357
5	5.00	0.290	8.03	1.606
6	5.00	0.275	7.62	1.523
7	5.00	0.245	6.78	1.357
8	5.00	0.270	7.48	1.495
9	5.00	0.255	7.06	1.412
10	5.00	0.240	6.65	1.329
11	5.00	0.240	6.65	1.329
12	5.00	0.245	6.78	1.356
13	5.00	0.240	6.65	1.330
			Steady Flow Rate, Q (in^3/min):	1.338



Field-Saturated Hydraulic Conductivity (Infiltration Rate)

K_{sat} = 1.13E-03 in/min 0.068 in/hr

APPENDIX D

APPENDIX D

RECOMMENDED GRADING SPECIFICATIONS

FOR

OCEANVIEW HILLS PA-61
SAN DIEGO, CALIFORNIA

PROJECT NO. 07955-42-02

RECOMMENDED GRADING SPECIFICATIONS

1. GENERAL

1.1 These Recommended Grading Specifications shall be used in conjunction with the Geotechnical Report for the project prepared by Geocon. The recommendations contained in the text of the Geotechnical Report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict.

1.2 Prior to the commencement of grading, a geotechnical consultant (Consultant) shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications. It shall be the responsibility of the Contractor to assist the Consultant and keep them apprised of work schedules and changes so that personnel may be scheduled accordingly.

1.3 It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans. If, in the opinion of the Consultant, unsatisfactory conditions such as questionable soil materials, poor moisture condition, inadequate compaction, and/or adverse weather result in a quality of work not in conformance with these specifications, the Consultant will be empowered to reject the work and recommend to the Owner that grading be stopped until the unacceptable conditions are corrected.

2. DEFINITIONS

2.1 **Owner** shall refer to the owner of the property or the entity on whose behalf the grading work is being performed and who has contracted with the Contractor to have grading performed.

2.2 **Contractor** shall refer to the Contractor performing the site grading work.

2.3 **Civil Engineer** or **Engineer of Work** shall refer to the California licensed Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topography.

2.4 **Consultant** shall refer to the soil engineering and engineering geology consulting firm retained to provide geotechnical services for the project.

2.5 **Soil Engineer** shall refer to a California licensed Civil Engineer retained by the Owner, who is experienced in the practice of geotechnical engineering. The Soil Engineer shall be responsible for having qualified representatives on-site to observe and test the Contractor's work for conformance with these specifications.

2.6 **Engineering Geologist** shall refer to a California licensed Engineering Geologist retained by the Owner to provide geologic observations and recommendations during the site grading.

2.7 **Geotechnical Report** shall refer to a soil report (including all addenda) which may include a geologic reconnaissance or geologic investigation that was prepared specifically for the development of the project for which these Recommended Grading Specifications are intended to apply.

3. MATERIALS

3.1 Materials for compacted fill shall consist of any soil excavated from the cut areas or imported to the site that, in the opinion of the Consultant, is suitable for use in construction of fills. In general, fill materials can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.

3.1.1 **Soil fills** are defined as fills containing no rocks or hard lumps greater than 12 inches in maximum dimension and containing at least 40 percent by weight of material smaller than ¾ inch in size.

3.1.2 **Soil-rock fills** are defined as fills containing no rocks or hard lumps larger than 4 feet in maximum dimension and containing a sufficient matrix of soil fill to allow for proper compaction of soil fill around the rock fragments or hard lumps as specified in Paragraph 6.2. **Oversize rock** is defined as material greater than 12 inches.

3.1.3 **Rock fills** are defined as fills containing no rocks or hard lumps larger than 3 feet in maximum dimension and containing little or no fines. Fines are defined as material smaller than ¾ inch in maximum dimension. The quantity of fines shall be less than approximately 20 percent of the rock fill quantity.

3.2 Material of a perishable, spongy, or otherwise unsuitable nature as determined by the Consultant shall not be used in fills.

3.3 Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Articles 9 and 10; 40CFR; and any other applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.

3.4 The outer 15 feet of *soil-rock* fill slopes, measured horizontally, should be composed of properly compacted *soil* fill materials approved by the Consultant. *Rock* fill may extend to the slope face, provided that the slope is not steeper than 2:1 (horizontal:vertical) and a soil layer no thicker than 12 inches is track-walked onto the face for landscaping purposes. This procedure may be utilized provided it is acceptable to the governing agency, Owner and Consultant.

3.5 Samples of soil materials to be used for fill should be tested in the laboratory by the Consultant to determine the maximum density, optimum moisture content, and, where appropriate, shear strength, expansion, and gradation characteristics of the soil.

3.6 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated condition

4. CLEARING AND PREPARING AREAS TO BE FILLED

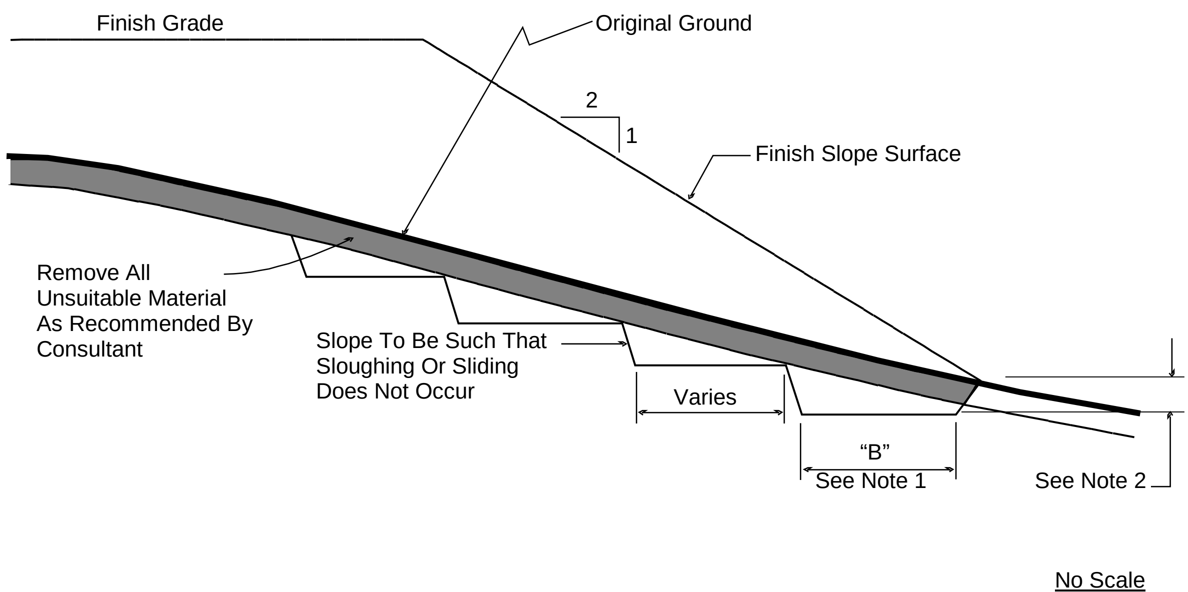
4.1 Areas to be excavated and filled shall be cleared and grubbed. Clearing shall consist of complete removal above the ground surface of trees, stumps, brush, vegetation, man-made structures, and similar debris. Grubbing shall consist of removal of stumps, roots, buried logs and other unsuitable material and shall be performed in areas to be graded. Roots and other projections exceeding 1½ inches in diameter shall be removed to a depth of 3 feet below the surface of the ground. Borrow areas shall be grubbed to the extent necessary to provide suitable fill materials.

4.2 Asphalt pavement material removed during clearing operations should be properly disposed at an approved off-site facility or in an acceptable area of the project evaluated by Geocon and the property owner. Concrete fragments that are free of reinforcing steel may be placed in fills, provided they are placed in accordance with Section 6.2 or 6.3 of this document.

4.3 After clearing and grubbing of organic matter and other unsuitable material, loose or porous soils shall be removed to the depth recommended in the Geotechnical Report. The depth of removal and compaction should be observed and approved by a representative of the Consultant. The exposed surface shall then be plowed or scarified to a minimum depth of 6 inches and until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.

4.4 Where the slope ratio of the original ground is steeper than 5:1 (horizontal:vertical), or where recommended by the Consultant, the original ground should be benched in accordance with the following illustration.

TYPICAL BENCHING DETAIL



DETAIL NOTES: (1) Key width "B" should be a minimum of 10 feet, or sufficiently wide to permit complete coverage with the compaction equipment used. The base of the key should be graded horizontal, or inclined slightly into the natural slope.

(2) The outside of the key should be below the topsoil or unsuitable surficial material and at least 2 feet into dense formational material. Where hard rock is exposed in the bottom of the key, the depth and configuration of the key may be modified as approved by the Consultant.

4.5 After areas to receive fill have been cleared and scarified, the surface should be moisture conditioned to achieve the proper moisture content, and compacted as recommended in Section 6 of these specifications.

5. COMPACTION EQUIPMENT

5.1 Compaction of *soil* or *soil-rock* fill shall be accomplished by sheepsfoot or segmented-steel wheeled rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment. Equipment shall be of such a design that it will be capable of compacting the *soil* or *soil-rock* fill to the specified relative compaction at the specified moisture content.

5.2 Compaction of *rock* fills shall be performed in accordance with Section 6.3.

6. PLACING, SPREADING AND COMPACTION OF FILL MATERIAL

6.1 *Soil* fill, as defined in Paragraph 3.1.1, shall be placed by the Contractor in accordance with the following recommendations:

6.1.1 *Soil* fill shall be placed by the Contractor in layers that, when compacted, should generally not exceed 8 inches. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to obtain uniformity of material and moisture in each layer. The entire fill shall be constructed as a unit in nearly level lifts. Rock materials greater than 12 inches in maximum dimension shall be placed in accordance with Section 6.2 or 6.3 of these specifications.

6.1.2 In general, the *soil* fill shall be compacted at a moisture content at or above the optimum moisture content as determined by ASTM D 1557.

6.1.3 When the moisture content of *soil* fill is below that specified by the Consultant, water shall be added by the Contractor until the moisture content is in the range specified.

6.1.4 When the moisture content of the *soil* fill is above the range specified by the Consultant or too wet to achieve proper compaction, the *soil* fill shall be aerated by the Contractor by blading/mixing, or other satisfactory methods until the moisture content is within the range specified.

6.1.5 After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to a relative compaction of at least 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry density of the compacted fill to the maximum laboratory dry density as determined in accordance with ASTM D 1557. Compaction shall be continuous over the entire area, and compaction equipment shall make sufficient passes so that the specified minimum relative compaction has been achieved throughout the entire fill.

6.1.6 Where practical, soils having an Expansion Index greater than 50 should be placed at least 3 feet below finish pad grade and should be compacted at a moisture content generally 2 to 4 percent greater than the optimum moisture content for the material.

6.1.7 Properly compacted *soil* fill shall extend to the design surface of fill slopes. To achieve proper compaction, it is recommended that fill slopes be over-built by at least 3 feet and then cut to the design grade. This procedure is considered preferable to track-walking of slopes, as described in the following paragraph.

6.1.8 As an alternative to over-building of slopes, slope faces may be back-rolled with a heavy-duty loaded sheepsfoot or vibratory roller at maximum 4-foot fill height intervals. Upon completion, slopes should then be track-walked with a D-8 dozer or similar equipment, such that a dozer track covers all slope surfaces at least twice.

6.2 *Soil-rock* fill, as defined in Paragraph 3.1.2, shall be placed by the Contractor in accordance with the following recommendations:

6.2.1 Rocks larger than 12 inches but less than 4 feet in maximum dimension may be incorporated into the compacted *soil* fill, but shall be limited to the area measured 15 feet minimum horizontally from the slope face and 5 feet below finish grade or 3 feet below the deepest utility, whichever is deeper.

6.2.2 Rocks or rock fragments up to 4 feet in maximum dimension may either be individually placed or placed in windrows. Under certain conditions, rocks or rock fragments up to 10 feet in maximum dimension may be placed using similar methods. The acceptability of placing rock materials greater than 4 feet in maximum dimension shall be evaluated during grading as specific cases arise and shall be approved by the Consultant prior to placement.

6.2.3 For individual placement, sufficient space shall be provided between rocks to allow for passage of compaction equipment.

6.2.4 For windrow placement, the rocks should be placed in trenches excavated in properly compacted *soil* fill. Trenches should be approximately 5 feet wide and 4 feet deep in maximum dimension. The voids around and beneath rocks should be filled with approved granular soil having a Sand Equivalent of 30 or greater and should be compacted by flooding. Windrows may also be placed utilizing an "open-face" method in lieu of the trench procedure, however, this method should first be approved by the Consultant.

6.2.5 Windrows should generally be parallel to each other and may be placed either parallel to or perpendicular to the face of the slope depending on the site geometry. The minimum horizontal spacing for windrows shall be 12 feet center-to-center with a 5-foot stagger or offset from lower courses to next overlying course. The minimum vertical spacing between windrow courses shall be 2 feet from the top of a lower windrow to the bottom of the next higher windrow.

6.2.6 Rock placement, fill placement and flooding of approved granular soil in the windrows should be continuously observed by the Consultant.

6.3 *Rock* fills, as defined in Section 3.1.3, shall be placed by the Contractor in accordance with the following recommendations:

6.3.1 The base of the *rock* fill shall be placed on a sloping surface (minimum slope of 2 percent). The surface shall slope toward suitable subdrainage outlet facilities. The *rock* fills shall be provided with subdrains during construction so that a hydrostatic pressure buildup does not develop. The subdrains shall be permanently connected to controlled drainage facilities to control post-construction infiltration of water.

6.3.2 *Rock* fills shall be placed in lifts not exceeding 3 feet. Placement shall be by rock trucks traversing previously placed lifts and dumping at the edge of the currently placed lift. Spreading of the *rock* fill shall be by dozer to facilitate *seating* of the rock. The *rock* fill shall be watered heavily during placement. Watering shall consist of water trucks traversing in front of the current rock lift face and spraying water continuously during rock placement. Compaction equipment with compactive energy comparable to or greater than that of a 20-ton steel vibratory roller or other compaction equipment providing suitable energy to achieve the required compaction or deflection as recommended in Paragraph 6.3.3 shall be utilized. The number of passes to be made should be determined as described in Paragraph 6.3.3. Once a *rock* fill lift has been covered with *soil* fill, no additional *rock* fill lifts will be permitted over the *soil* fill.

6.3.3 Plate bearing tests, in accordance with ASTM D 1196, may be performed in both the compacted *soil* fill and in the *rock* fill to aid in determining the required minimum number of passes of the compaction equipment. If performed, a minimum of three plate bearing tests should be performed in the properly compacted *soil* fill (minimum relative compaction of 90 percent). Plate bearing tests shall then be performed on areas of *rock* fill having two passes, four passes and six passes of the compaction equipment, respectively. The number of passes required for the *rock* fill shall be determined by comparing the results of the plate bearing tests for the *soil* fill and the *rock* fill and by evaluating the deflection variation with number of passes. The required number of passes of the compaction equipment will be performed as necessary until the plate bearing deflections are equal to or less than that determined for the properly compacted *soil* fill. In no case will the required number of passes be less than two.

6.3.4 A representative of the Consultant should be present during *rock* fill operations to observe that the minimum number of "passes" have been obtained, that water is being properly applied and that specified procedures are being followed. The actual number of plate bearing tests will be determined by the Consultant during grading.

6.3.5 Test pits shall be excavated by the Contractor so that the Consultant can state that, in their opinion, sufficient water is present and that voids between large rocks are properly filled with smaller rock material. In-place density testing will not be required in the *rock* fills.

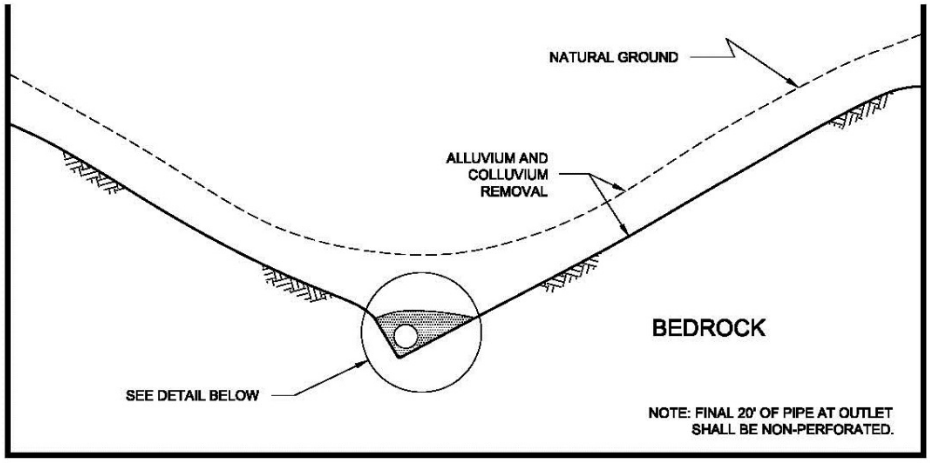
6.3.6 To reduce the potential for "piping" of fines into the *rock* fill from overlying *soil* fill material, a 2-foot layer of graded filter material shall be placed above the uppermost lift of *rock* fill. The need to place graded filter material below the *rock* should be determined by the Consultant prior to commencing grading. The gradation of the graded filter material will be determined at the time the *rock* fill is being excavated. Materials typical of the *rock* fill should be submitted to the Consultant in a timely manner, to allow design of the graded filter prior to the commencement of *rock* fill placement.

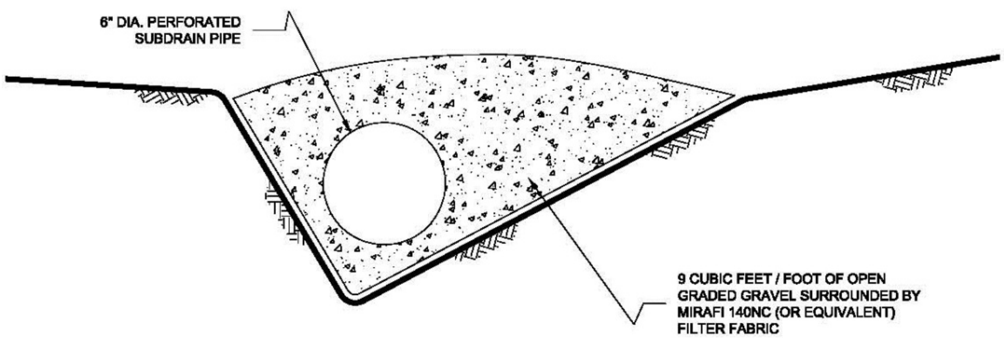
6.3.7 *Rock* fill placement should be continuously observed during placement by the Consultant.

7. SUBDRAINS

7.1 The geologic units on the site may have permeability characteristics and/or fracture systems that could be susceptible under certain conditions to seepage. The use of canyon subdrains may be necessary to mitigate the potential for adverse impacts associated with seepage conditions. Canyon subdrains with lengths in excess of 500 feet or extensions of existing offsite subdrains should use 8-inch-diameter pipes. Canyon subdrains less than 500 feet in length should use 6-inch-diameter pipes.

TYPICAL CANYON DRAIN DETAIL





NOTES:

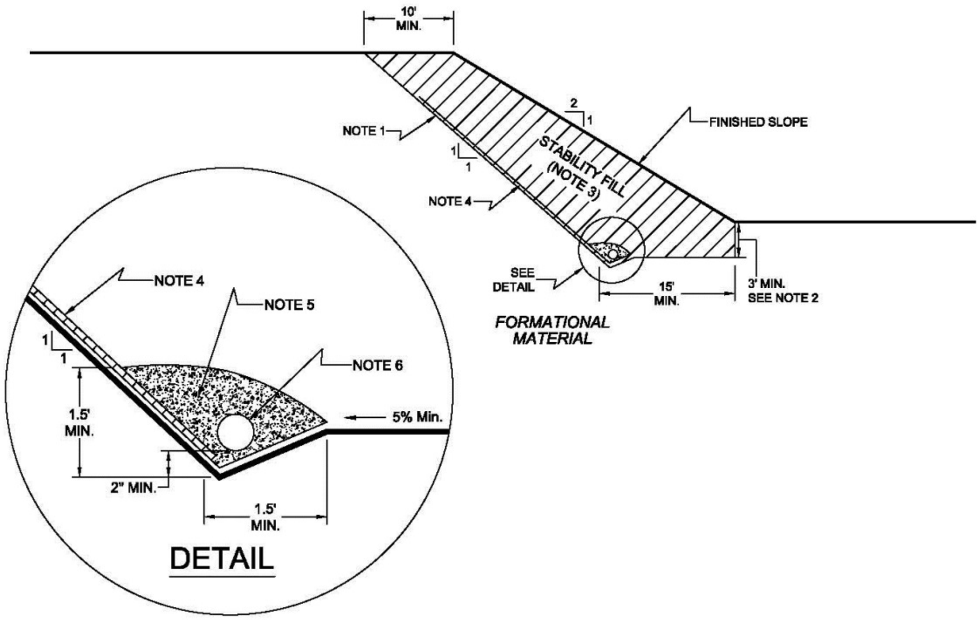
1......8-INCH DIAMETER, SCHEDULE 80 PVC PERFORATED PIPE FOR FILLS IN EXCESS OF 100-FEET IN DEPTH OR A PIPE LENGTH OF LONGER THAN 500 FEET.

2......6-INCH DIAMETER, SCHEDULE 40 PVC PERFORATED PIPE FOR FILLS LESS THAN 100-FEET IN DEPTH OR A PIPE LENGTH SHORTER THAN 500 FEET.

NO SCALE

7.2 Slope drains within stability fill keyways should use 4-inch-diameter (or lager) pipes.

TYPICAL STABILITY FILL DETAIL



NOTES:

1.....EXCAVATE BACKCUT AT 1:1 INCLINATION (UNLESS OTHERWISE NOTED).

2.....BASE OF STABILITY FILL TO BE 3 FEET INTO FORMATIONAL MATERIAL, SLOPING A MINIMUM 5% INTO SLOPE.

3.....STABILITY FILL TO BE COMPOSED OF PROPERLY COMPACTED GRANULAR SOIL.

4.....CHIMNEY DRAINS TO BE APPROVED PREFABRICATED CHIMNEY DRAIN PANELS (MIRADRAIN G200N OR EQUIVALENT) SPACED APPROXIMATELY 20 FEET CENTER TO CENTER AND 4 FEET WIDE. CLOSER SPACING MAY BE REQUIRED IF SEEPAGE IS ENCOUNTERED.

5.....FILTER MATERIAL TO BE 3/4-INCH, OPEN-GRADED CRUSHED ROCK ENCLOSED IN APPROVED FILTER FABRIC (MIRAFI 140NC).

6.....COLLECTOR PIPE TO BE 4-INCH MINIMUM DIAMETER, PERFORATED, THICK-WALLED PVC SCHEDULE 40 OR EQUIVALENT, AND SLOPED TO DRAIN AT 1 PERCENT MINIMUM TO APPROVED OUTLET.

NO SCALE

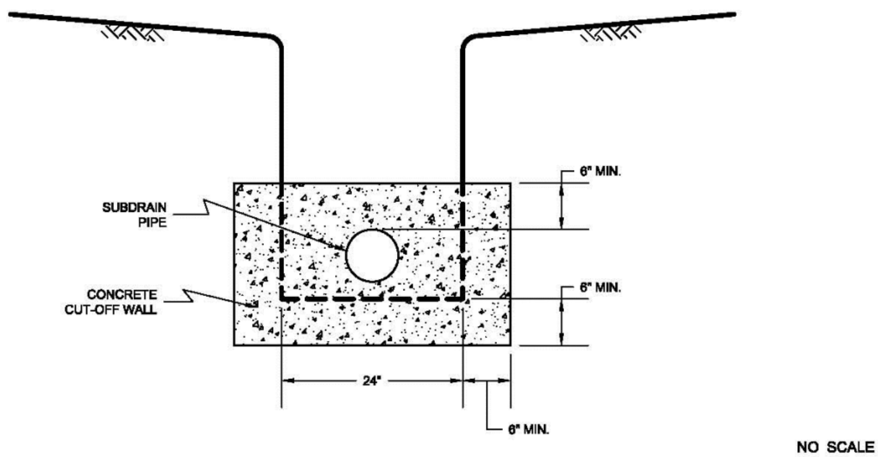
7.3 The actual subdrain locations will be evaluated in the field during the remedial grading operations. Additional drains may be necessary depending on the conditions observed and the requirements of the local regulatory agencies. Appropriate subdrain outlets should be evaluated prior to finalizing 40-scale grading plans.

7.4 *Rock* fill or *soil-rock* fill areas may require subdrains along their down-slope perimeters to mitigate the potential for buildup of water from construction or landscape irrigation. The subdrains should be at least 6-inch-diameter pipes encapsulated in gravel and filter fabric. *Rock* fill drains should be constructed using the same requirements as canyon subdrains.

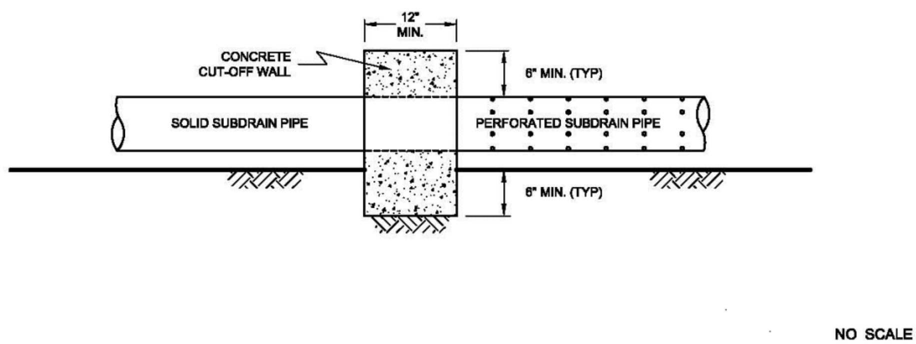
7.5 Prior to outletting, the final 20-foot segment of a subdrain that will not be extended during future development should consist of non-perforated drainpipe. At the non-perforated/ perforated interface, a seepage cutoff wall should be constructed on the downslope side of the pipe.

TYPICAL CUT OFF WALL DETAIL

FRONT VIEW

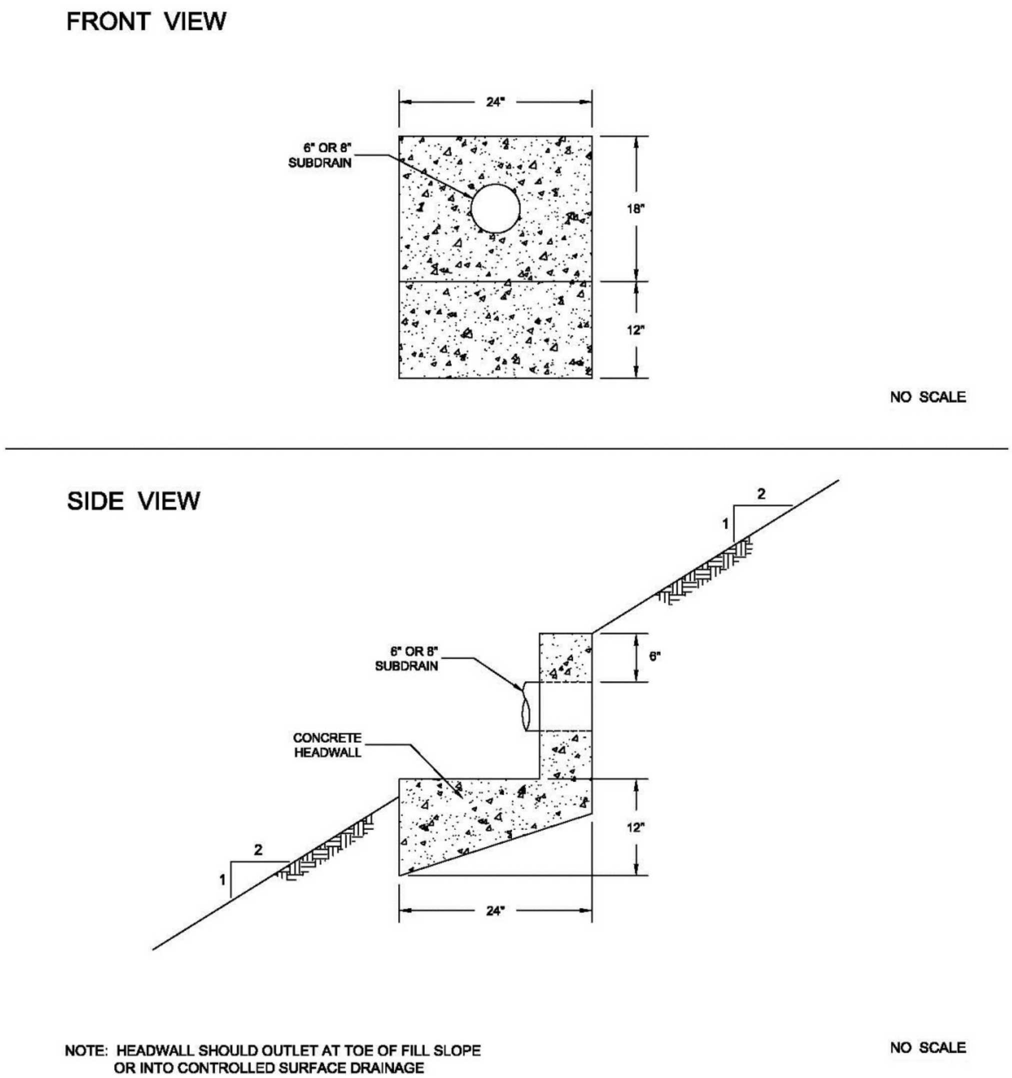


SIDE VIEW



7.6 Subdrains that discharge into a natural drainage course or open space area should be provided with a permanent headwall structure.

TYPICAL HEADWALL DETAIL



7.7 The final grading plans should show the location of the proposed subdrains. After completion of remedial excavations and subdrain installation, the project civil engineer should survey the drain locations and prepare an “as-built” map showing the drain locations. The final outlet and connection locations should be determined during grading operations. Subdrains that will be extended on adjacent projects after grading can be placed on formational material and a vertical riser should be placed at the end of the subdrain. The grading contractor should consider videoing the subdrains shortly after burial to check proper installation and functionality. The contractor is responsible for the performance of the drains.

8. OBSERVATION AND TESTING

8.1 The Consultant shall be the Owner's representative to observe and perform tests during clearing, grubbing, filling, and compaction operations. In general, no more than 2 feet in vertical elevation of *soil* or *soil-rock* fill should be placed without at least one field density test being performed within that interval. In addition, a minimum of one field density test should be performed for every 2,000 cubic yards of *soil* or *soil-rock* fill placed and compacted.

8.2 The Consultant should perform a sufficient distribution of field density tests of the compacted *soil* or *soil-rock* fill to provide a basis for expressing an opinion whether the fill material is compacted as specified. Density tests shall be performed in the compacted materials below any disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof is below that specified, the particular layer or areas represented by the test shall be reworked until the specified density has been achieved.

8.3 During placement of *rock* fill, the Consultant should observe that the minimum number of passes have been obtained per the criteria discussed in Section 6.3.3. The Consultant should request the excavation of observation pits and may perform plate bearing tests on the placed *rock* fills. The observation pits will be excavated to provide a basis for expressing an opinion as to whether the *rock* fill is properly seated and sufficient moisture has been applied to the material. When observations indicate that a layer of *rock* fill or any portion thereof is below that specified, the affected layer or area shall be reworked until the *rock* fill has been adequately seated and sufficient moisture applied.

8.4 A settlement monitoring program designed by the Consultant may be conducted in areas of *rock* fill placement. The specific design of the monitoring program shall be as recommended in the Conclusions and Recommendations section of the project Geotechnical Report or in the final report of testing and observation services performed during grading.

8.5 We should observe the placement of subdrains, to check that the drainage devices have been placed and constructed in substantial conformance with project specifications.

8.6 Testing procedures shall conform to the following Standards as appropriate:

8.6.1 Soil and Soil-Rock Fills:

8.6.1.1 Field Density Test, ASTM D 1556, *Density of Soil In-Place By the Sand-Cone Method.*

8.6.1.2 Field Density Test, Nuclear Method, ASTM D 6938, *Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).*

8.6.1.3 Laboratory Compaction Test, ASTM D 1557, *Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Pound Hammer and 18-Inch Drop*.

8.6.1.4. Expansion Index Test, ASTM D 4829, *Expansion Index Test*.

9. PROTECTION OF WORK

9.1 During construction, the Contractor shall properly grade all excavated surfaces to provide positive drainage and prevent ponding of water. Drainage of surface water shall be controlled to avoid damage to adjoining properties or to finished work on the site. The Contractor shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control features have been installed. Areas subjected to erosion or sedimentation shall be properly prepared in accordance with the Specifications prior to placing additional fill or structures.

9.2 After completion of grading as observed and tested by the Consultant, no further excavation or filling shall be conducted except in conjunction with the services of the Consultant.

10. CERTIFICATIONS AND FINAL REPORTS

10.1 Upon completion of the work, Contractor shall furnish Owner a certification by the Civil Engineer stating that the lots and/or building pads are graded to within 0.1 foot vertically of elevations shown on the grading plan and that all tops and toes of slopes are within 0.5 foot horizontally of the positions shown on the grading plans. After installation of a section of subdrain, the project Civil Engineer should survey its location and prepare an *as-built* plan of the subdrain location. The project Civil Engineer should verify the proper outlet for the subdrains and the Contractor should ensure that the drain system is free of obstructions.

10.2 The Owner is responsible for furnishing a final as-graded soil and geologic report satisfactory to the appropriate governing or accepting agencies. The as-graded report should be prepared and signed by a California licensed Civil Engineer experienced in geotechnical engineering and by a California Certified Engineering Geologist, indicating that the geotechnical aspects of the grading were performed in substantial conformance with the Specifications or approved changes to the Specifications.

LIST OF REFERENCES

Boore, D. M., and G. M Atkinson (2006), *Boore-Atkinson NGA Ground Motion Relations for the Geometric Mean Horizontal Component of Peak and Spectral Ground Motion Parameters*, Report Number PEER 2007/01, May 2007;

Campbell, K. W., Y. Bozorgnia, *NGA Ground Motion Model for the Geometric Mean Horizontal Component of PGA, PGV, PGD and 5% Damped Linear Elastic Response Spectra for Periods Ranging from 0.01 to 10 s*, Preprint of version submitted for publication in the NGA Special Volume of Earthquake Spectra, Volume 24, Issue 1, pages 139-171, February 2008;

Chiou, Brian S. J. and Robert R. Youngs, Robert R, *A NGA Model for the Average Horizontal Component of Peak Ground Motion and Response Spectra*, preprint for article to be published in NGA Special Edition for Earthquake Spectra, Spring 2008;

Geocon Incorporated, *Update Geotechnical Report, South Otay Mesa Corporate Center, California Terraces Planning Area 61, San Diego, California,* February 29, 2008 (Project No. 07955-42-01);

Kennedy, M. P., and Tan, S. S., (2008), *Geologic Map of the San Diego 30' x 60' Quadrangle, California*, USGS Regional Geologic Map Series, 1:100,000 Scale, Map No. 3;

Risk Engineering, *EZ-FRISK*, 2015;

City of San Diego (2008), *Seismic Safety Study, Geologic Hazards and Faults, Map Sheet 7*;

USGS (2016), *Quaternary Fault and Fold Database of the United States*: U.S. Geological Survey website, http://earthquakes,usgs.gov/hazards/qfaults, accessed May 2, 2017;

USGS (2017), U.S. Seismic Design Maps; USGS Earthquake Hazards Program website, https://earthquake.usgs.gov/designmaps/us/application.php, accessed May 2, 2017;

Unpublished Geotechnical Reports and Information, Geocon Incorporated.

UPDATED GEOLOGIC MAP

OCEANVIEW HILLS – PA 61
SAN DIEGO, CALIFORNIA

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

PARDEE HOMES
SAN DIEGO, CALIFORNIA

JULY 11, 2018
PROJECT NO. 07955-42-02

GEOCON
INCORPORATED

GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. 07955-42-02
July 11, 2018

Pardee Homes
13400 Sabre Springs Parkway, Suite 200
San Diego, California 92128

Attention: Mr. Allen Kashani

Subject: UPDATED GEOLOGIC MAP
OCEANVIEW HILLS – PA 61
SAN DIEGO, CALIFORNIA

Reference: *Update Geotechnical Investigation, Oceanview Hills – PA 61, San Diego, California,* prepared by Geocon Incorporated dated March 15, 2018 (Project No. 07955-42-02).

Dear Mr. Kashani:

In accordance with the request of Civil Sense, Inc., we have prepared this letter to provide an updated geologic map using the latest grading plan. Civil Sense provided an AutoCAD file of the grading plan which was used as the base map to generate the Geologic Map (Figure 1) and the Cross Sections (Figure 2). Based on our review of the grading plan, the recommendations contained in the referenced geotechnical investigation remain applicable to the project.

Should you have any questions regarding this letter, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

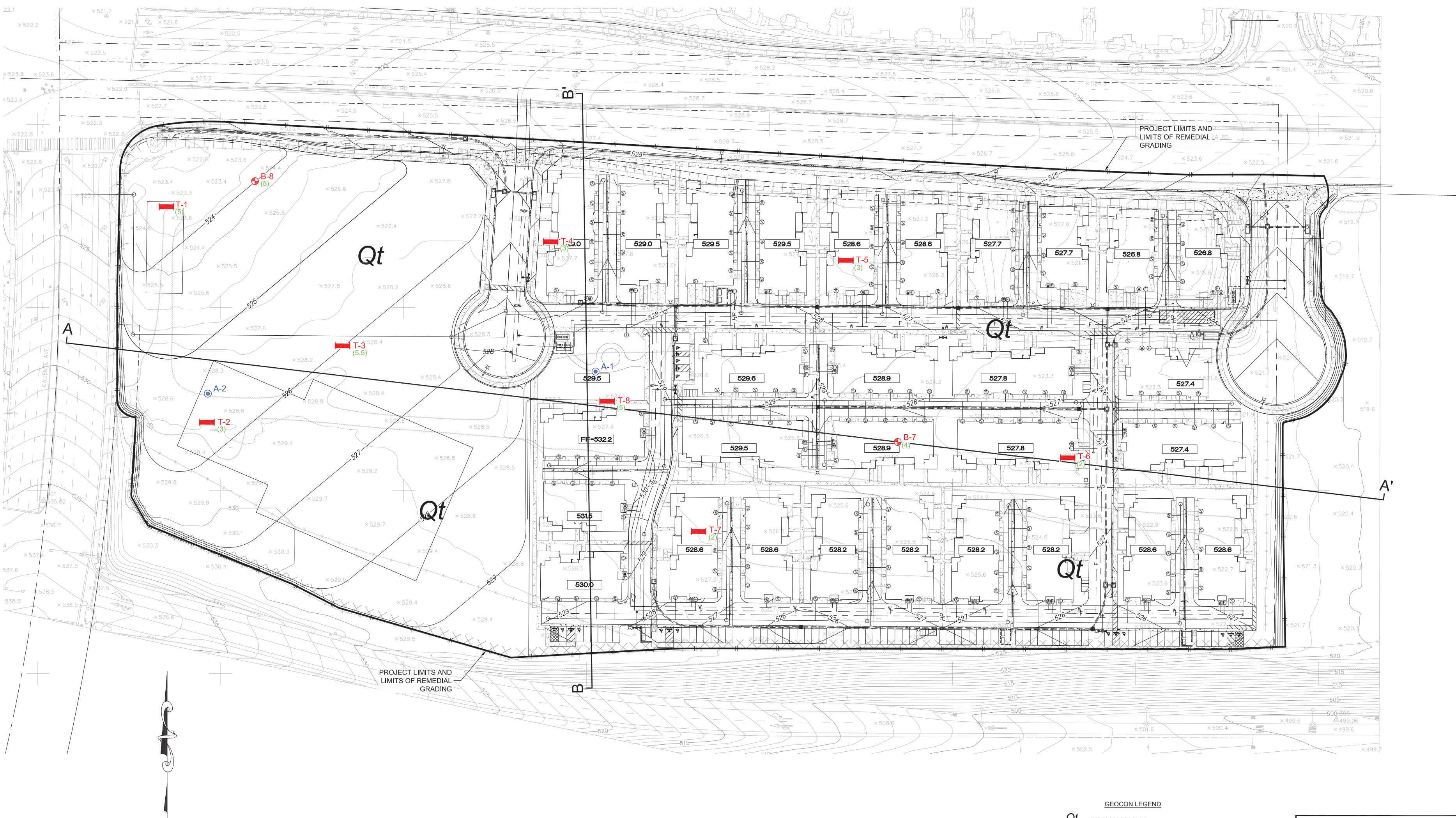
REGISTERED PROFESSIONAL ENGINEER
RODNEY C. MIKESELL
No.2533
GEOTECHNICAL
STATE OF CALIFORNIA

Rodney C. Mikesell
GE 2533

RCM:dmc

(e-mail) Addressee
(3/del) Civil Sense, Inc.
Attention: Ms. Maykia Vang

6960 Flanders Drive ■ San Diego, California 92121-2974 ■ Telephone 858.558.6900 ■ Fax 858.558.6159



GRAPHIC SCALE

0' 25' 50' 75' 100' 150' 200'

SCALE 1"=50' (on 36x24)

GEOCON LEGEND

Qt ....TERRACE DEOPOSITS

T-8 ....APPROX. LOCATION OF TRENCH

A-2 ....APPROX. LOCATION OF INFILTRATION TEST

B-8 ....APPROX. LOCATON OF PREVIOUS BORING (Geocon)

(5.5) ....APPROX. THICKNESS OF SURFICIAL SOIL

B B' ....APPROX. LOCATION OF GEOLOGIC CROSS SECTION

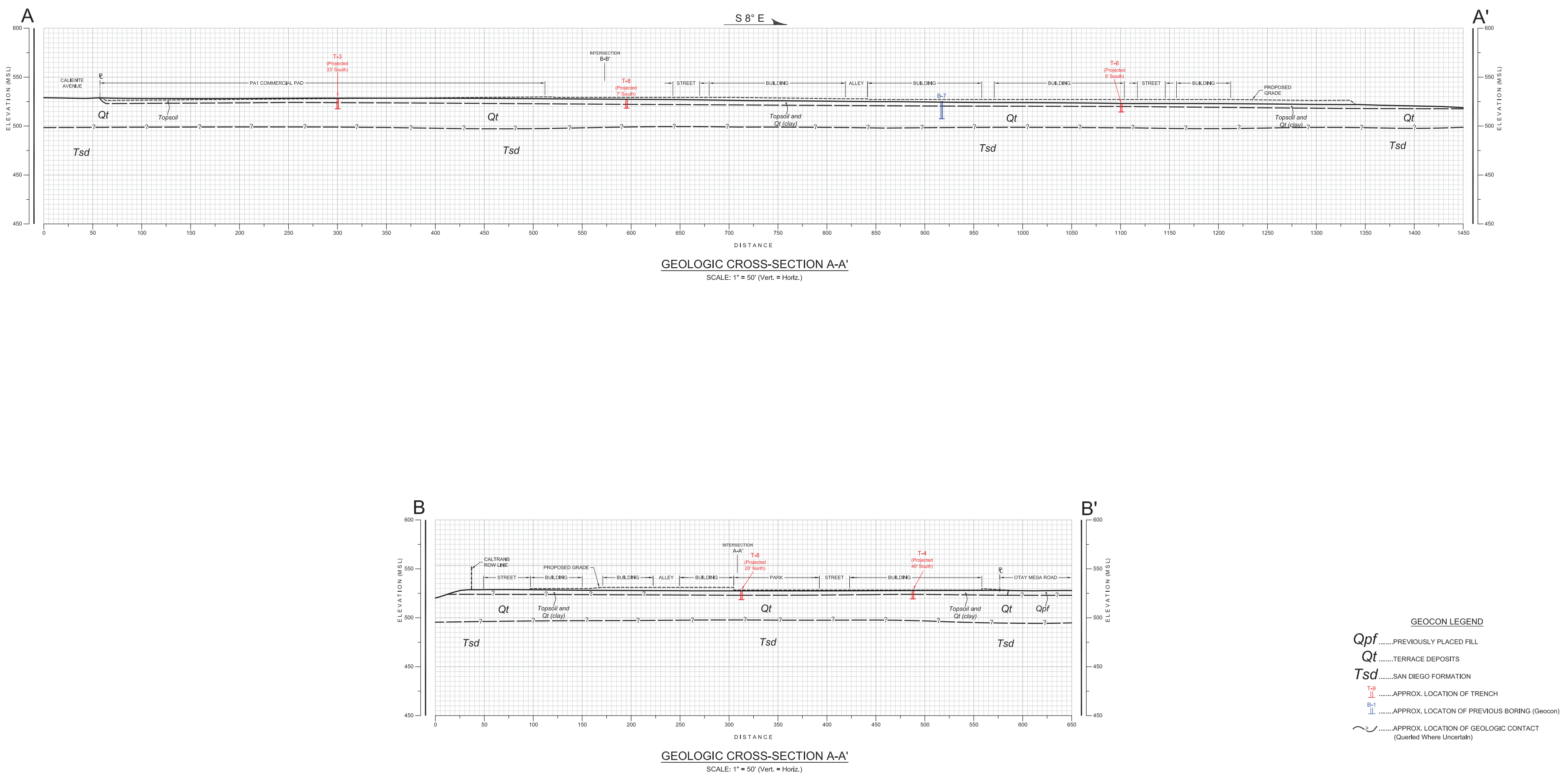
GEOLOGIC MAP

OCEANVIEW HILLS - PA 61
SAN DIEGO, CALIFORNIA

GEOCON INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

SCALE 1" = 50'	DATE 07 - 11 - 2018	
PROJECT NO. 07955 - 42 - 02		FIGURE 1
SHEET 1 OF 1		

Plotted:07/11/2018 12:05PM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\07955-42-02 California Terraces\SHEETS\07955-42-02 Geo Map Update.dwg



GEOLOGIC CROSS SECTION

OCEANVIEW HILLS - PA 61
SAN DIEGO, CALIFORNIA

GEOCON INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

SCALE 1" = 50'	DATE 07 - 11 - 2018
PROJECT NO. 07955 - 42 - 02	FIGURE 2
SHEET 1 OF 1	

Plotted:07/11/2018 11:52AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\07955-42-02 California Terraces\SHEETS\07955-42-02 XSections Update.dwg

DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER

CONSULTING ENGINEERS

SEWER SERVICE ANALYSIS FOR THE CALIFORNIA TERRACES PLANNING AREA 61 PROJECT IN THE CITY OF SAN DIEGO

October 19, 2018

2234 FARADAY AVENUE • CARLSBAD, CA • (760) 438-4422

SEWER SERVICE ANALYSIS
FOR THE CALIFORNIA TERRACES
PLANNING AREA 61 PROJECT
IN THE CITY OF SAN DIEGO

October 19, 2018

REGISTERED PROFESSIONAL ENGINEER
STEVEN J. HENDERSON
C 87620
EXP. 09/30/19
CIVIL
STATE OF CALIFORNIA

10-19-2018

Prepared by:
Dexter Wilson Engineering, Inc.
2234 Faraday Avenue
Carlsbad, CA 92008
(760) 438-4422

Job No. 648-032

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DEXTER WILSON ENGINEERING, INC.

DEXTER S. WILSON, P.E.
ANDREW M. OVEN, P.E.
STEPHEN M. NIELSEN, P.E.
NATALIE J. FRASCHETTI, P.E.
STEVEN J. HENDERSON, P.E.

October 19, 2018 648-032

Pardee Homes
13400 Sabre Springs Parkway, Suite 200
San Diego, CA 92128

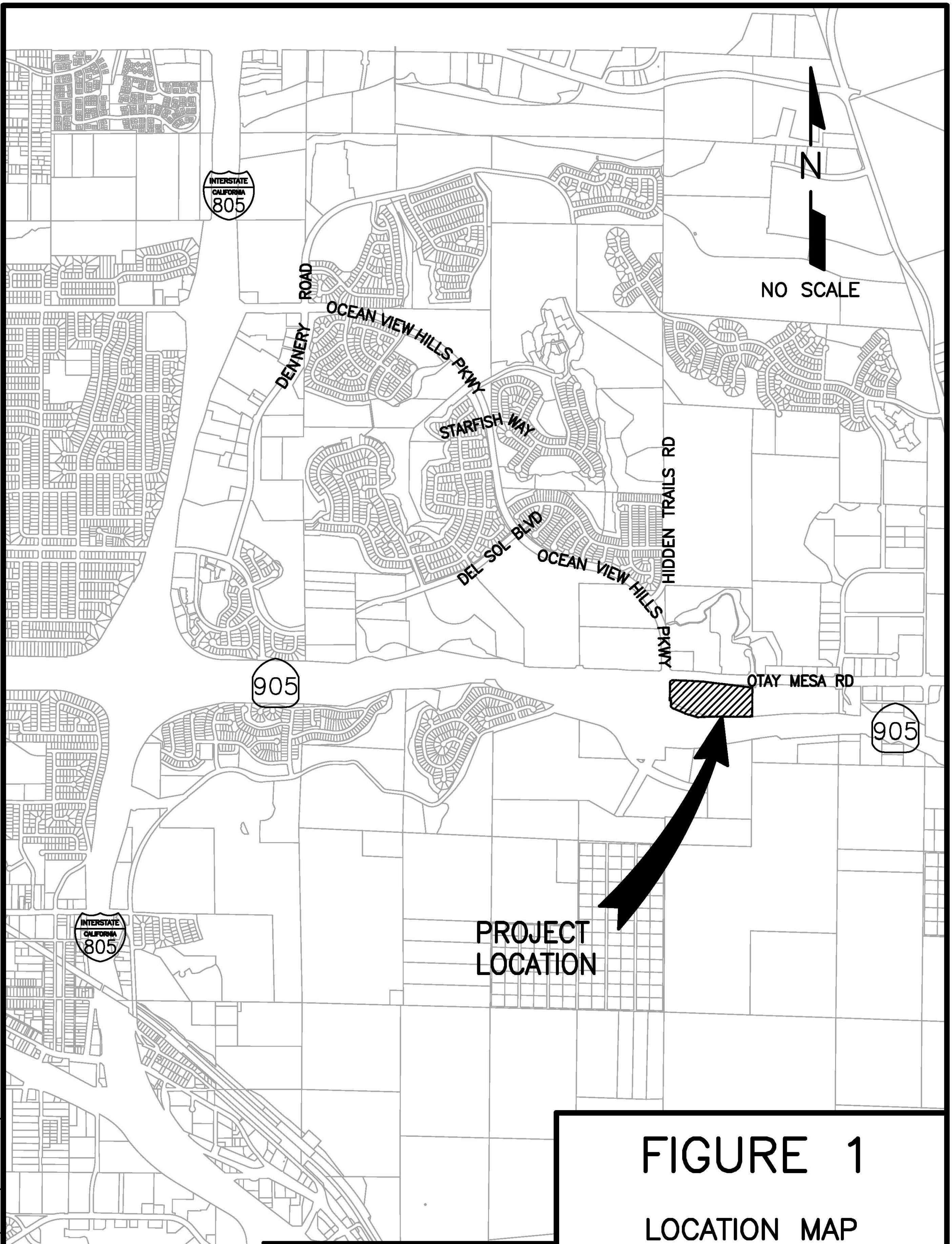
Attention: Allen Kashani, Director of Project Management

Subject: Sewer Service Analysis for the California Terraces Planning Area 61 Project in the City of San Diego

Introduction

This report provides a sewer study for the California Terraces Planning Area 61 (PA61) project in the City of San Diego. The project proposes up to 45,000 SF of commercial uses within Lot 1 totaling 195,584 SF (4.49 AC) and multi-family residential units including affordable units and a private recreation park all within Lot 2 totaling 400,752 SF (9.20 AC). The residential development permits a density of 15 to 29 units per acre within the RM-2-5 zone and would allow Lot 2 to construct up to a maximum of 267 multi-family residential units. The 13.7 gross acres project site is located at the southeast corner of Otay Mesa Road and Caliente Ave and within the Otay Mesa Community Plan Area.

Topography of the buildable portion of the site drains from east to west. The site will be designed to connect to the existing gravity sewer line at the west end of the project in Caliente Avenue. Figure 1 provides a location map for the project and a conceptual site plan is attached as Appendix A.



\ARTIC\DWG\648032\PA61_FIGURE-1_VM.DWG 04-11-18 14:39:44 LAYOUT: LAYOUT1

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CONSULTING ENGINEERS
(760) 438-4422

FIGURE 1

LOCATION MAP

PA61

Purpose of Study

The purpose of this study is to determine if the existing public gravity sewer system and proposed private gravity sewer system are both able to provide adequate capacity for the PA61 project. This report will address if any offsite (public) sewer system improvements are needed for the development of the project so that the offsite sewer system will be in conformance with the City of San Diego sewer system design standards.

The onsite sewer facilities for the PA61 project are proposed to be private. These facilities will be designed in accordance with the City's sewer system design standards as well.

Study Area

In general the study area for this sewer report is the sewer sub-basin comprising of the tributary area surrounding Ocean View Hills Parkway to the north and west of the PA61 project. This sub-basin system collects the wastewater flow from the California Terraces development in the City. The gravity sewer in Ocean View Hills Parkway (10-inch to 18-inch diameter) is a trunk sewer line that conveys wastewater to the connection with the 27-inch diameter Otay Valley Trunk Sewer near the I-805 crossing with the Otay River.

Wastewater from the PA61 project will flow through and connect to the existing 10-inch portion of the Ocean View Hills Parkway and Caliente Avenue gravity sewer line. At Sea Fire Point the gravity sewer line increases in diameter to 15-inch before increasing in diameter again at Dennery Road to 18-inch. These existing public sewer facilities can be seen on Figure 2.

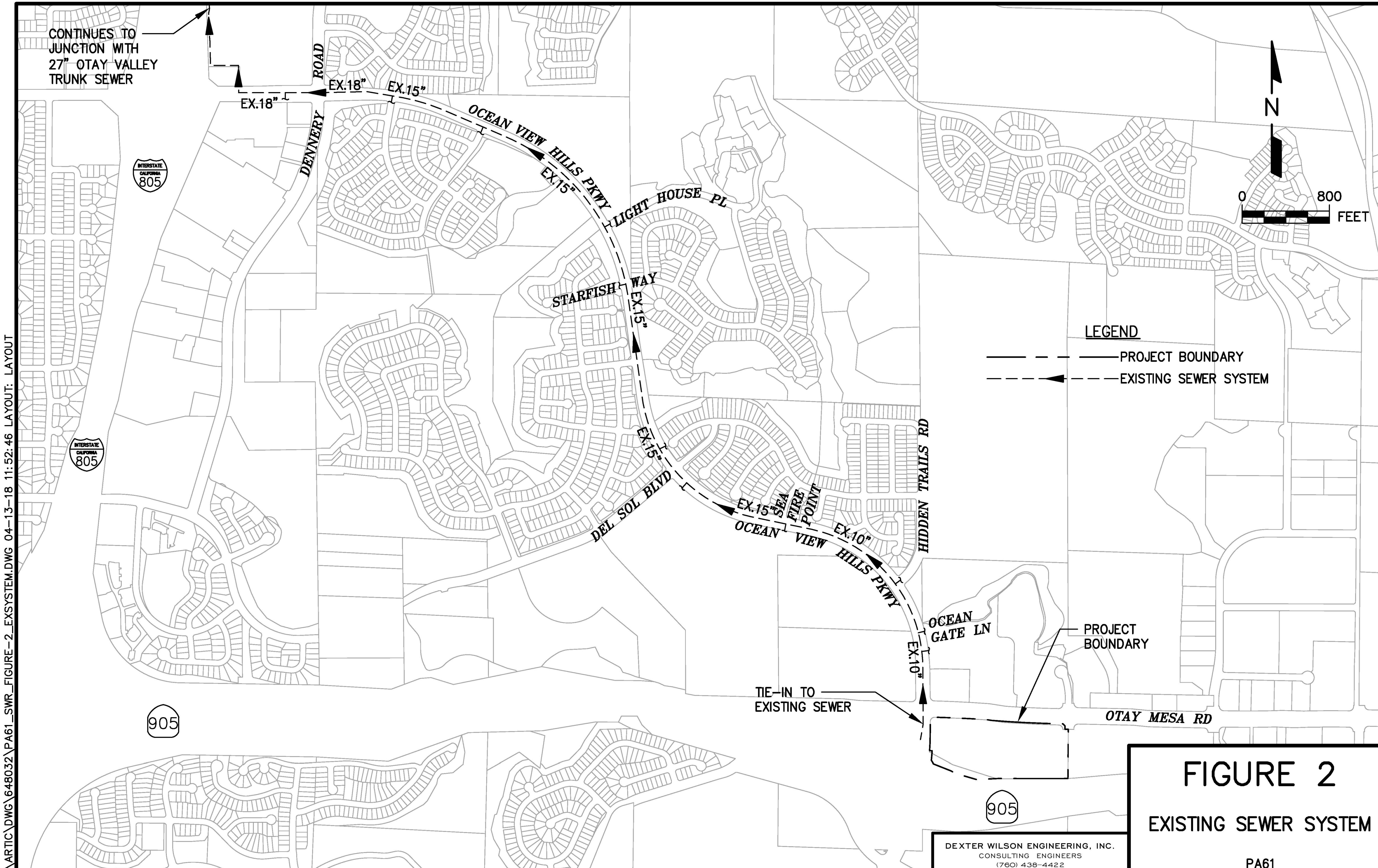

FIGURE 2

EXISTING SEWER SYSTEM

PA61

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\\ARTIC\DWG\648032\PA61_SWR_FIGURE-2_EXSYSTEM.DWG 04-13-18 11:52:46 LAYOUT: LAYOUT

City of San Diego Sewer Design Criteria

Sewer system analyses criteria are based on the Sewer Design Guide, Revised May 2015, City of San Diego Public Utilities Department. This guideline is used for analysis and sizing of new gravity sewer lines and for analysis of existing gravity sewer lines. A summary of the design criteria from the Sewer Design Guide is presented in Table 1 below.

TABLE 1
CITY OF SAN DIEGO PUBLIC UTILITIES DEPARTMENT
SEWER SYSTEM DESIGN CRITERIA

Criterion	Design Requirement	Design Guide Reference
Sewage Flow Generation	80 gallons per capita	1.3.2.2
Dry Weather Peaking Factor	Figure 1-1 based on population	1.3.2.2
Wet Weather Peaking Factor	Basin specific – determined by City	1.3.2.2
Gravity Flow Hydraulic Formula	Manning's Equation	1.3.3.1
Manning's 'n'	0.013	1.3.3.1
Desirable Gravity Flow Velocity	3 fps to 5 fps	1.3.3.1
Minimum Gravity Flow Velocity	2 fps	1.3.3.1
Where 2 fps is not achievable	Set min. slope at 1%	1.3.3.1
Maximum Gravity Flow Velocity	10 fps	1.3.3.1
Maximum Depth of Flow at Peak Wet Weather		
For 15" Pipe and Smaller	d/D = 0.50	1.3.3.3
For 18" and Larger	d/D = 0.75	1.3.3.3
Minimum Acceptable Gravity Sewer Main Size		
For Residential Areas	8" diameter	1.3.3.4
For Commercial, Industrial, and High-Rise Bldgs.	10" diameter	1.3.3.4
Net Acreage	= 0.80 x Gross Acres	Table 1-1

PA61 Project Sewer Generation

The sewer generation for the PA61 project was developed in accordance with the City of San Diego Design Guidelines and Standards. Per a City plan check comment, the sewer generation for the multi-family residential units will be equal to the single-family EDU sewer generation factor of 280 gpd per EDU. The PA61 project proposes up to 267 residential units over 9.20 net acres equaling 29.0 units per acre.

Table 2 presents the projected sewer generation for the PA61 project.

TABLE 2
PA61 PROJECT
SEWER GENERATION

Land Use	Quantity	Generation Factor	Average Sewer Generation, gpd
Multi-Family Residential (29 DUs/net acre)	267 Units	280 gpd/DU	74,760
Commercial	4.49 Acres	3,500 gpd/acre	15,715
TOTAL			**90,475 = 62.8 gpm**

From the City of San Diego's Sewer Design Guide, Figure 1-1, the peak dry weather flow to average flow ratio is approximately 2.47 based on the formula presented in the figure, resulting in an estimated peak dry weather flow of 223,473 gpd (155.2 gpm).

Appendix B presents the backup data for determining the peaking factors. For estimating the peak flows, average flow was based on the project's average wastewater generation presented in Table 2.

PA61 Offsite Sewer System Analysis

The offsite analysis completed for the PA61 project is to calculate the new flows through the existing gravity sewer line in Caliente Avenue and Ocean View Hills Parkway from the project connection to the junction with the 10-inch stub serving the existing wastewater flow from the Greenfield Village Apartments near Ocean Gate Lane. This offsite sewer calculation/analysis is presented in Appendix C for the 10-inch gravity sewer line.

Analysis of Existing 10-inch Sewer. The computer spreadsheet output for the offsite sewer analysis for the existing 10-inch sewer line is presented in Appendix C. The sewer line and manhole numbering is shown on the As-Built drawings and Exhibit A for this existing sewer provided in Appendix C. As shown in the spreadsheet calculation in Appendix C, the sewer flow from the PA61 project meets all City design criteria, including a minimum velocity of two feet per second (fps), in the existing 10-inch gravity sewer line with and/or without an assigned peak wet weather factor.

Currently there is no flow into this gravity sewer line. There previously was flow from the Princess Park development into this gravity sewer line via a private force main. Once the 42-inch Otay Mesa Trunk Sewer line was completed in Old Otay Mesa Road this force main was abandoned. Therefore, once completed, the PA61 project will be the only development flowing into this stretch of the 10-inch gravity sewer line. The remaining portion of the 10-inch gravity sewer line has an increased slope and flow from other existing development which is described in more detail in the sub-section below.

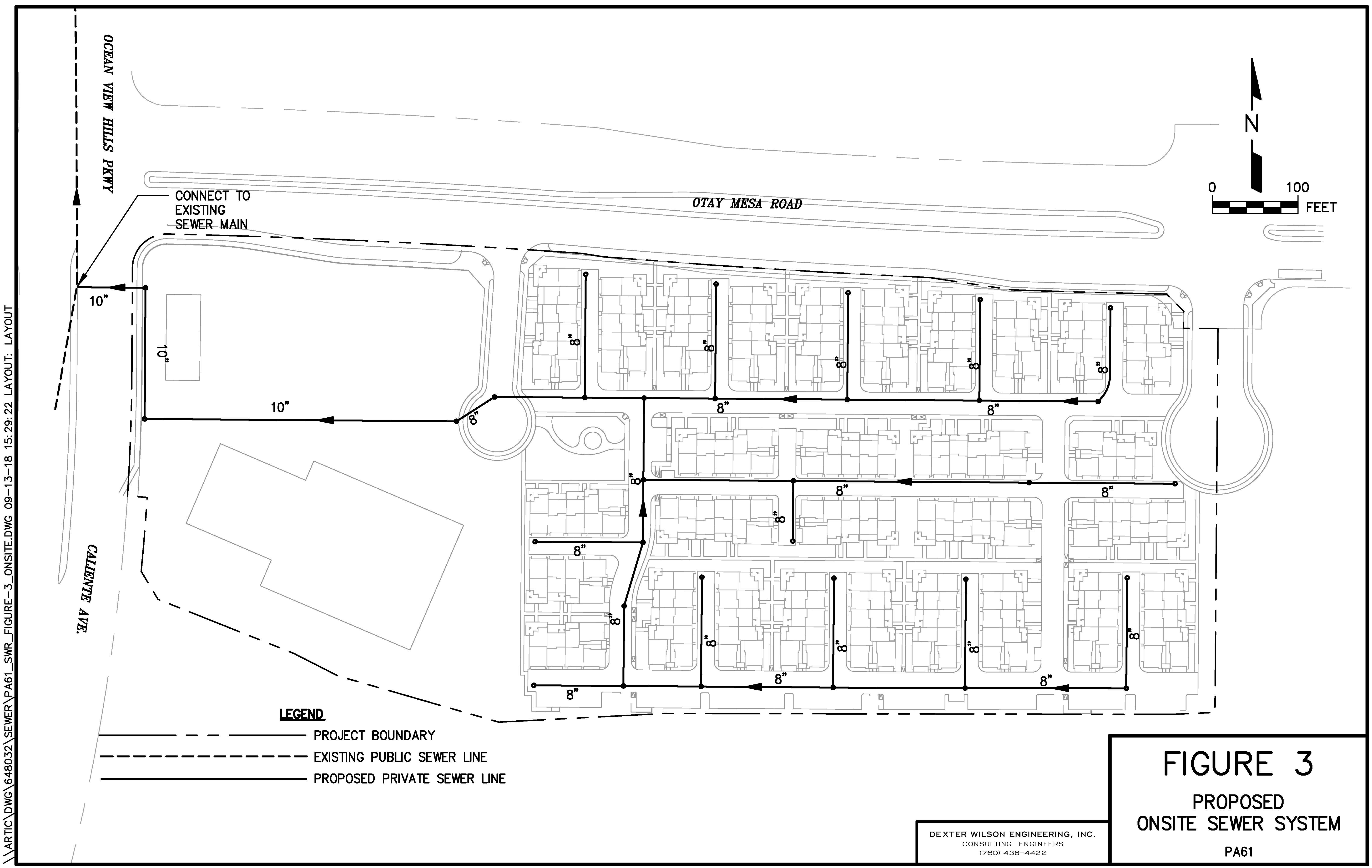
The maximum depth-to-diameter (d/D) ratio in this sewer line for project flows is 0.45 d/D at a velocity of 2.74 fps.

Analysis of Existing 15-inch and 18-inch Sewers. The increase in flow in the existing 15-inch and 18-inch offsite sewer segments in Ocean View Hills Parkway due to the additional PA61 flow is not significant. Appendix D presents an exhibit illustrating an approved California Terraces Sewer Basin EDU count. This exhibit allocates 199 EDUs for PA61. Although the project is estimated to generate up to 323 EDUs of wastewater, the subtraction of areas (Princess Park development, San Ysidro High School, etc.) that previously were tributary (via a sewer lift station) to Ocean View Hills Parkway gives sufficient allotment for the extra 124 EDUs in PA61.

PA61 Onsite Sewer System Analysis

In addition to the offsite analysis, an onsite sewer analysis was completed utilizing the proposed manhole inverts throughout the project. The private onsite gravity sewer system was designed according to the City's Sewer Design Guide. All segments where velocities of 2 fps could not be achieved, there is a minimum slope of one percent. The onsite analysis results are presented in Appendix C. Exhibit A presents the manhole and pipe diagram for the proposed onsite sewer system.

The sewer modeling results show the depth ratios and velocities in the proposed onsite gravity sewer lines are in compliance with City design criteria. Figure 3 illustrates the proposed onsite sewer system



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(760) 438-4422

FIGURE 3

PROPOSED ONSITE SEWER SYSTEM

PA61

Conclusions and Recommendations

The following conclusions and recommendations are summarized based on the sewer system analysis prepared for the proposed PA61 project.

1. The PA61 project consisting of up to 267 multi-family dwelling units and 4.49 acres of commercial land use will gravity sewer to the existing Ocean View Hills trunk sewer system.

2. Finished grade elevations on the project allow it to gravity flow its wastewater to an existing 10-inch diameter gravity sewer line located in Caliente Avenue adjacent to the project.

3. The development of the PA61 project is projected to result in average sewage flow of 90,475 gpd.

4. No offsite gravity sewer improvements are needed to provide sewer service to the proposed project.

5. The sewer system analysis conducted indicates that the existing public gravity sewer lines downstream of the project site can accommodate the wastewater flows for the PA61 project.

6. The proposed private onsite gravity sewer system is designed according to City of San Diego Sewer Design Guide and complies with all design criteria (depth, velocity, minimum slope, etc.). Figure 3 illustrates the proposed onsite sewer system.

If you have any questions regarding the information or conclusions and recommendations presented in this report, please do not hesitate to contact the undersigned.

Dexter Wilson Engineering, Inc.

Steven J. Henderson, P.E.

SH:AO:sg

Attachments

APPENDIX A

PA61 UTILITY SITE PLAN

STORM DRAIN

NOT TO SCALE

PUBLIC RIGHT OF WAY DATA			
NO.	DELTA OR BRG.	RADIUS(ft)	LENGTH(ft)
1	50°28'44"	10.00	8.81
2	176°03'50"	45.00	138.28
3	104°53'37"	45.00	82.38
4	50°28'43"	10.00	8.81
5	N44°15'05"W	------	25.29
6	N00°26'43"E	------	79.98
7	40°20'49"	40.00	28.17
8	130°19'32"	65.00	147.85

LEGEND

- VTM BOUNDARY
- PROPOSED PRIVATE WATER MAIN (SIZE PER PLAN) CITY OF SAN DIEGO SDW-110, SDW-148, SDW-157
- PROPOSED PRIVATE FIRE MAIN (SIZE PER PLAN) PER NFPA PAMPHLET 24 (2016 EDITION)
- PROPOSED PRIVATE WATER SERVICE CALIFORNIA PLUMBING CODE
- PROPOSED PRIVATE FIRE SERVICE PER NFPA PAMPHLET 24 (2016 EDITION)
- PROPOSED FIRE REDUCE PRESSURE DETECTOR ASSEMBLY CITY OF SAN DIEGO SDW-120
- PROPOSED DUAL WATER METERS AND BACK FLOW DEVICE CITY OF SAN DIEGO SDW-119
- PROPOSED PRIVATE SEWER AND SEWER MANHOLE (SIZE PER PLAN) CALIFORNIA PLUMBING CODE
- PROPOSED SEWER FLOW (SLOPE PER PLAN)
- PROPOSED PRIVATE SEWER LATERAL CALIFORNIA PLUMBING CODE
- PROPOSED PRIVATE IRRIGATION SERVICE, METER, AND BACKFLOW PREVENTION DEVICE.
- PROPOSED STORM DRAIN (PRIVATE UNLESS OTHERWISE NOTED) CITY OF SAN DIEGO D-61 AND SDD-110
- PROPOSE STORM DRAIN GRATED INLET (TYPE-I) (PRIVATE UNLESS OTHERWISE NOTED) CITY OF SAN DIEGO SDD-114, D-15, AND D-29
- PROPOSED STORM DRAIN CURB INET (TYPE-B) (PRIVATE UNLESS OTHERWISE NOTED) CITY OF SAN DIEGO SDD-114 AND SDD-116
- PROPOSED STORM DRAIN CLEAN OUT (TYPE A-4) (PRIVATE UNLESS OTHERWISE NOTED) CITY OF SAN DIEGO SDD-114 AND D-09
- PROPOSED FIRE HYDRANT CITY OF SAN DIEGO SDW-104, SDW-148, AND SDW-151
- 1 BUILDING NUMBER
- 528.6 PAD ELEVATION
- 530 PROPOSED CONTOURS
- PROPOSED RETAINING WALL
- PROPOSED DAYLIGHT LINE / LIMIT OF WORK
- PROPOSED STREET LIGHT 130w LED PER CALTRANS TYPE 16 POLE
- 1.0% SURFACE FLOW DIRECTION AND SLOPE GRADIENT

NOTE: ALL SEWER, WATER, AND STORM DRAIN UTILITIES ARE PRIVATE UNLESS OTHERWISE NOTED.

MINIMUM TREE SEPARATION DISTANCE

IMPROVEMENT	MIN. DISTANCE TO STREET TREE
TRAFFIC SIGNAL, STOP SIGN	20 FEET
UNDERGROUND UTILITY LINES (EXCEPT SEWER)	5 FEET
SEWER LINES	10 FEET
ABOVE GROUND UTILITY STRUCTURES (TRANSFORMERS, HYDRANTS, UTILITY POLES, ETC)	10 FEET
DRIVEWAYS	10 FEET *
INTERSECTIONS (INTERSECTING CURB LINES OF TWO STREETS)	25 FEET

* 5 FEET ON RESIDENTIAL LOCAL STREETS WITH A DESIGN SPEED OF 25MPH OR SLOWER

UTILITY TABLE

UTILITY	OVERHEAD/UNDERGROUND
GAS	UNDERGROUND
ELECTRIC	UNDERGROUND
TELEPHONE (AT&T)	UNDERGROUND
CABLE TELEVISION (COX)	UNDERGROUND
SEWER	UNDERGROUND
STORM DRAIN	UNDERGROUND
FIRE	UNDERGROUND
WATER	UNDERGROUND

NOTE: THE SUBDIVIDER SHALL ENSURE THAT ALL ONSITE UTILITIES SERVING THE SUBDIVISION SHALL BE UNDERGROUNDED WITH ALL OF THE APPROPRIATE PERMITS.

UTILITY NOTES

1. NO TREES OR SHRUBS EXCEEDING THREE FEET IN HEIGHT AT MATURITY SHALL BE INSTALLED WITHIN TEN FEET OF ANY SEWER AND FIVE FEET OF ANY WATER FACILITIES.
2. MINIMUM 10 FOOT SEPARATION FROM SEWER MAINS TO WATER MAINS. 10 FOOT SEPARATION TO BE MEASURED FROM OUTSIDE EDGE OF PIPE TO OUTSIDE EDGE OF PIPE.
3. ALL WATER SERVICES TO THE SITE, INCLUDING DOMESTIC, IRRIGATION AND FIRE, WILL REQUIRE PRIVATE, ABOVE GROUND BACK FLOW PREVENTION DEVICES (BFPDS). BFPDS ARE TYPICALLY LOCATED ON PRIVATE PROPERTY, IN LINE WITH THE SERVICE AND IMMEDIATELY ADJACENT TO THE RIGHT-OF-WAY. THE PUBLIC UTILITIES DEPARTMENT WILL NOT PERMIT THE REQUIRED BFPDS TO BE LOCATED BELOW GRADE OR WITHIN THE STRUCTURE.
4. IF A 3" OR LARGER METER IS REQUIRED FOR THIS PROJECT, THE OWNER/PERMITTEE SHALL CONSTRUCT THE NEW METER AND PRIVATE BACKFLOW DEVICE ON SITE, ABOVE GROUND, WITHIN AN ADEQUATELY SIZED WATER EASEMENT, IN A MANNER SATISFACTORY TO THE PUBLIC UTILITIES DIRECTOR AND THE CITY ENGINEER.
5. PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS, THE OWNER/PERMITTEE SHALL OBTAIN AN ENCROACHMENT MAINTENANCE REMOVAL AGREEMENT, FROM THE CITY ENGINEER, FOR THE PRIVATE SEWER LATERAL IN THE STREET A RIGHT-OF-WAY.

PREPARED BY:

CIVIL SENSE INC
13475 Danielson Street, Suite 150 | Poway, CA 92064
Office: 858-842-4353

0 20 40 80 120
(IN FEET)
1 inch = 40 ft.

HENRY H. PENG
R.C.E. 63686

9/21/18
DATE

REGISTERED PROFESSIONAL ENGINEER
HENRY H. PENG
No. 63686
Exp. 09-30-20
CIVIL
STATE OF CALIFORNIA

GRADING NOTES / BMP NOTES

1. BMP MAINTENANCE – PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL ENTER INTO A MAINTENANCE AGREEMENT FOR THE ONGOING PERMANENT BMP MAINTENANCE, SATISFACTORY TO THE CITY ENGINEER.
2. CONSTRUCTION BMP – PRIOR TO ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION1 (GRADING REGULATIONS) OR SAN DIEGO MUNICIPAL CODE, INTO THE CONSTRUCTION PLANS OR SPECIFICATIONS.

NAME: CIVIL SENSE, INC.
ADDRESS: 13475 DANIELON STREET, SUITE 150
POWAY, CA 92128
PHONE: 858-843-4253

PROJECT ADDRESS:
SE CORNER OF OTAY MESA
ROAD AND CALIENTE AVENUE

PROJECT NAME:
CALIFORNIA TERRACES - PA61
VTM, SDP, MPDP, NDP, CPA, REZONE
AND STREET VACATION

SHEET TITLE:
GRADING AND UTILITY PLAN

REVISION 12:	
REVISION 11:	
REVISION 10:	
REVISION 9:	
REVISION 8:	
REVISION 7:	
REVISION 6:	
REVISION 5:	
REVISION 4:	
REVISION 3:	10/31/18
REVISION 2:	09/19/18
REVISION 1:	07/13/18
ORIGINAL DATE:	04/16/18

SHEET 5 OF 13

DEP #

APPENDIX B

CITY OF SAN DIEGO SEWER DESIGN CRITERIA

street alignments) and all potential points of entry of sewage from surrounding lands.

1.3.1.3 **Depth of Mains**

The planning study shall clearly identify all existing and/or proposed facilities which will exceed standard depths for sewer mains as defined in Subsection 2.2.1.5. In cases where proposed sewers will exceed 15 feet in depth, a request for design deviation (ATTACHMENT 2) must be submitted to the Water and Sewer Development Review Senior Civil Engineer with the Sewer Planning Study. A design deviation will only be approved in exceptional cases and when adequate justification is provided. Mains more than 20 feet deep shall also require approval from the Wastewater Collection Division Senior Civil Engineer.

1.3.1.4 **Existing Studies**

The City of San Diego maintains an extensive library of sewer planning studies which were prepared for lands throughout the City. These studies are available for review at the Water and Sewer Development Section, Public Utilities Department. All studies are catalogued by subdivision or trunk sewer name. Logs of sewer flow study analyses for recently monitored trunk sewers and a map of sewers which meet the Regional Water Quality Control Board (RWQCB) criteria for being critical or sub-critical may also be viewed. In addition, information regarding proposed CIP projects within the vicinity of a given project may be requested. In many cases, an addendum or reference to one of the existing planning studies may be acceptable in lieu of an independent study. Concurrent with the preparation of planning studies for sewers proposed to connect to existing canyon sewer mains, a study of flow redirection per Council Policy 400-13 and a cost-benefit analysis per Council Policy 400-14 shall be prepared (Refer to ATTACHMENT 1). An existing analysis of redirection of flows and a cost-benefit analysis, as required by Council Policies 400-13 and 400-14 respectively, may be available for reference for various existing canyon sewers.

1.3.2 **Flow Estimation**

1.3.2.1 **Land Use**

Present or future allowable land use, whichever results in higher equivalent population, shall be used to generate potential sewage flows.

1.3.2.2 **Flow Determination**

Flow definitions and calculation procedures are listed below. All calculations shall be tabulated for each sewer main section (manhole to manhole) in the format shown on Figure 1-2.

Equivalent Population: The equivalent population shall be calculated from zoning information (Ref. Section 1.6). For major new facilities such as high rise apartment buildings, flow rates (assuming one lateral) shall be checked based on the most current, adopted edition of the Uniform Plumbing Code. The most conservative flow rate shall govern.

Daily Per Capita Sewer Flow: The sewer flow for the equivalent population shall be 80 gallons per capita per day (gpcd).

Average Dry Weather Flow (ADWF): Equivalent populations shall be used to calculate the average dry weather flow. The average dry weather flow for each sewer main reach (manhole to manhole) shall be determined by multiplying the total accumulated equivalent population contributing to that reach by 80 gallons per capita per day:

Average Dry Weather Flow = (80 gpcpd) x (Equivalent Population)

Peaking Factor for Dry Weather Flow (PFDWF): The peaking factor is the ratio of peak dry weather flow to average dry weather flow. It is dependent upon the equivalent population within a tributary area. The tributary area is the area upstream of, and including, the current reach for the total flow in each reach of pipe. Figure 1-1, consisting of the table prepared by Holmes and Narver in 1960, shall be used to determine peaking factors for each tributary area. In no instance shall the dry weather flow peaking factor be less than 1.5.

Peak Dry Weather Flow (PDWF): The peak dry weather flow for each sewer main reach shall be determined by multiplying the average dry weather flow by the appropriate peaking factor (Note that peak dry weather flows are not algebraically cumulative as routed through the sewer system, i.e. the peak dry weather flow at any point shall be based on the equivalent population in the basin to that point (Ref. Figure 1-2).

Peak Dry Weather Flow = (Average Dry Weather Flow) x (Dry Weather Flow Peaking Factor)

Peaking Factor for Wet Weather Flow (PFWWF): The peaking factor for wet weather flow is the ratio of peak wet weather flow to peak dry weather flow. It is basin-specific and shall be based on essential information available at the time of the planning study. Information such as historical rainfall/sewage flow data, land use, soil data, pipe/manhole age, materials and conditions, groundwater elevations (post development), inflow and infiltration (I/I) studies, size, slope and densities of the drainage basin, etc., should be utilized in the wet weather analysis to estimate the peaking factor for wet weather. Upward adjustments shall be made in areas with expected high inflow and infiltration (i.e. high ground water or in areas with lush landscaping schemes). Flow meters are installed throughout the City's sewer system. Flow data collected from these meters are available upon request. The objective of this analysis is to quantify the magnitude of peak wet weather flow with a 10-year return period on a statistical basis.

The Senior Civil Engineer overseeing the preparation of the planning study shall coordinate with the City Sewer Modeling Group for approval of the peaking factors to be used for design.

Peak Wet Weather Flow (PWWF): The peak wet weather flow (or design flow) for a gravity sewer main reach shall be determined by multiplying the peak dry weather flow (ref. Figure 1-2) by the appropriate wet weather peaking factor. The peak wet weather flow is the design flow for a gravity sewer main. It is determined at any point in the system based on the associated upstream average dry weather flow in the basis to that point times the peaking factor for wet weather.

Peak Wet Weather Flow = (Peak Dry Weather Flow) x (Wet Weather Peaking Factor)

1.3.3 Pipe Sizing Criteria

1.3.3.1 Hydraulic Requirements

Manning's formula for open-channel flows shall be used to calculate flows in gravity sewer mains. Manning's coefficient of roughness "n" shall be assumed to be 0.013 for all types of sewer pipe. Sewer grades shall be designed for velocities of 3 to 5 feet per second (fps) where possible. This is extremely important in areas where peak flow will not be achieved for many years. The minimum allowable velocity is 2 fps at calculated peak dry weather flow, excluding infiltration. Sewer mains that do not sustain 2 fps at peak flows shall be designed to have a minimum slope of 1 percent. Additional slope may be required by the Senior Civil Engineer where fill of varied depth is placed below the pipe in order to provide adequate slope after expected settlement occurs. The maximum allowable velocity shall be 10 fps and shall be avoided by adjusting slopes, by increasing the pipe diameter, or by utilizing a vertical curve transition to lower velocities per subsections 2.2.4 and 2.2.9.4. If the Senior Civil Engineer approves a velocity greater than 10 fps, the pipe shall be upgraded to SDR 18 PVC (standard dimension ratio polyvinyl chloride), concrete-encased VC (vitrified clay), or PVC sheet-lined reinforced concrete pipe.

TABLE 1-1
CITY OF SAN DIEGO SEWER DESIGN GUIDE
DENSITY CONVERSIONS

Zone	Maximum Density (DU/Net Ac)	Population per DU	Equivalent Population (Pop/Net Ac)
AR-1-1, RE-1-1	0.1	3.5	0.4
RE-1-2	0.2	3.5	0.7
AR-1-2, RE-1-3	1	3.5	3.5
RS-1-1, RS-1-8	1	3.5	3.5
RS-1-2, RS-1-9	2	3.5	7.0
RS-1-3, RS-1-10	3	3.5	10.5
RS-1-4, RS-1-11	4	3.5	14.0
RS-1-5, RS-1-12	5	3.5	17.5
RS-1-6, RS-1-13	7	3.5	24.5
RS-1-7, RS-1-14	9	3.5	31.5
RX-1-1	11	3.4	37.4
RT-1-1	12	3.3	39.6
RX-1-2, RT-1-2, RU-1-1	14	3.2	44.8
RT-1-3, RM-1-2	17	3.1	52.7
RT-1-4	20	3.0	60.0
RM-1-3	22	3.0	66.0
RM-2-4	25	3.0	75.0
RM-2-5	29	3.0	87.0
RM-2-6	35	2.8	98.0
RM-3-7, RM-5-12	43	2.6	111.8
RM-3-8	54	2.4	129.6
RM-3-9	73	2.2	160.6
RM-4-10	109	1.8	196.2
RM-4-11	218	1.5	327.0

TABLE 1-1
CITY OF SAN DIEGO SEWER DESIGN GUIDE
DENSITY CONVERSIONS (Continued)

Zone	Maximum Density (DU / Net Ac)	Population Per DU	Equivalent Population (Pop/Net Ac)
Schools/Public	8.9	3.5	31.2
Offices	10.9	3.5	38.2*
Commercial/Hotels	12.5	3.5	43.7*
Industrial	17.9	3.5	62.5*
Hospital	42.9	3.5	150.0*

Figures with asterisk (*) represent equivalent population per floor of the building.

<u>Definitions:</u>
DU = Dwelling Units
Ac = Acreage
Pop = Population

Net Acreage is the developable lot area excluding areas that are dedicated as public streets in acres. Gross Area is the entire area in acres of the drainage basin, including lots, streets, etc.

For undeveloped areas, assume Net Acreage = 0.8 x Gross Area in Acres

For developed areas, calculate actual Net Acreage.

Tabulated figures are for general case. <u>The tabulated figures shall not be used if more accurate figures are available.</u>

Population is based on actual equivalent dwelling units (EDU) or the maximum estimate obtained from zoning.

Conversion of Fixture Units to Equivalent Dwelling Units (EDU): The Water Meter Data Card, maintained by the Development Services Department, contains a table of plumbing fixtures that should be used for determining the equivalent dwelling units (EDU's) for the purpose of estimating the rate of wastewater generation in residential, commercial, or industrial areas. Currently, the basis for conversion is: 20 fixtures = 1 EDU and 1 EDU = 280 gallons of wastewater per day.

In high rise building areas, flow rates shall be based on the most current, adopted edition of the applicable Plumbing Code, assuming one lateral per area. The most conservative flow rate shall govern.

PUBLIC UTILITIES DEPARTMENT

PEAKING FACTOR FOR SEWER FLOWS
(Dry Weather)

Ratio of Peak to Average Flow*
Versus Tributary Population

Population	Ratio of Peak to Average Flow	Population	Ratio of Peak to Average Flow
200	4.00	4,800	2.01
500	3.00	5,000	2.00
800	2.75	5,200	1.99
900	2.60	5,500	1.97
1,000	2.50	6,000	1.95
1,100	2.47	6,200	1.94
1,200	2.45	6,400	1.93
1,300	2.43	6,900	1.91
1,400	2.40	7,300	1.90
1,500	2.38	7,500	1.89
1,600	2.36	8,100	1.87
1,700	2.34	8,400	1.86
1,750	2.33	9,100	1.84
1,800	2.32	9,600	1.83
1,850	2.31	10,000	1.82
1,900	2.30	11,500	1.80
2,000	2.29	13,000	1.78
2,150	2.27	14,500	1.76
2,225	2.25	15,000	1.75
2,300	2.24	16,000	1.74
2,375	2.23	16,700	1.73
2,425	2.22	17,400	1.72
2,500	2.21	18,000	1.71
2,600	2.20	18,900	1.70
2,625	2.19	19,800	1.69
2,675	2.18	21,500	1.68
2,775	2.17	22,600	1.67
2,850	2.16	25,000	1.65
3,000	2.14	26,500	1.64
3,100	2.13	28,000	1.63
3,200	2.12	32,000	1.61
3,500	2.10	36,000	1.59
3,600	2.09	38,000	1.58
3,700	2.08	42,000	1.57
3,800	2.07	49,000	1.55
3,900	2.06	54,000	1.54
4,000	2.05	60,000	1.53
4,200	2.04	70,000	1.52
4,400	2.03	90,000	1.51
4,600	2.02	100,000+	1.50

***Based on formula:** **Peak Factor = 6.2945 x $(pop)^{-0.1342}$**
(Holmes & Narver, 1960)

FIGURE 1-1

Review Information

Cycle Type:	11 Submitted (Multi-Discipline)	**Submitted:**	07/13/2018	Deemed Complete on 07/13/2018
Reviewing Discipline:	PUD-Water & Sewer Dev	**Cycle Distributed:**	07/13/2018	
Reviewer:	**Itkin, Irina**	**Assigned:**	07/16/2018	
	(619) 446-5422	**Started:**	07/30/2018	
	iitkin@sandiego.gov	**Review Due:**	08/15/2018	
Hours of Review:	8.00	**Completed:**	08/08/2018	**COMPLETED ON TIME**
Next Review Method:	Submitted (Multi-Discipline)	**Closed:**	08/17/2018	

. The review due date was changed to 08/15/2018 from 08/07/2018 per agreement with customer.
. The reviewer has indicated they want to review this project again. Reason chosen by the reviewer: Partial Response to Cmnts/Regs.
. We request a 2nd complete submittal for PUD-Water & Sewer Dev on this project as: Submitted (Multi-Discipline).
. The reviewer has requested more documents be submitted.
. Your project still has 20 outstanding review issues with PUD-Water & Sewer Dev (17 of which are new issues).
. Last month PUD-Water & Sewer Dev performed 160 reviews, 93.8% were on-time, and 72.8% were on projects at less than < 3 complete submittals.

1st Review Comments:

Cleared?	Issue Num	Issue Text
☐	10	The Developer is required to install all facilities, as required by the accepted water and sewer studies, necessary to serve this development. (From Cycle 5)
☐	11	The project proposes to connect to the existing 24" SCRW water transmission main at three locations. We have sent the plans for operational review as they may have a concern about connecting to the existing 24" SCRW and have not allowed direct connections to the transmission main in the past. If Operations does not approve the connection a parallel line would be required. The existing 16" parallel line should be extended in Otay Mesa Road from the intersection of Emerald Crest and Otay Mesa Road to the 20" PVC at the intersection of Otay Mesa Road and Caliente Road. (From Cycle 5)
☐	13	If the intent is to provide irrigation meter for the park, please show the meter and back flow preventer for the park. (From Cycle 5)
☐	14	Please show a water easement for the master meter only off public Street "A". Also show a master meter, back flow preventer and a water easement for the master meter off public Street "B". Note that the backflow preventer off public Street "B" cannot be located in the public right of way. (From Cycle 5)

2nd review Comments:

Cleared?	Issue Num	Issue Text
☐	32	The connections to the existing 24" SCRW transmission pipeline are not recommended due to it's poor condition reported by the Water Operation. (New Issue)
☐	33	Please redesign the water main to serve the proposed development. (New Issue)
☐	34	Connect the proposed 16" PVC water pipeline to the existing 12" PVC Water main on the east side of Ocean View Hills Pkwy to the intersection of the Caliente Avenue and Otay Mesa Road. (New Issue)
☐	35	Continue the proposed 16" water main in Otay Mesa Road south of the existing 24" SCRW transmission line to the point of connection to the existing 12" stub out from 24" SCRW transmission line. (New Issue)
☐	36	Revise the water study to comply with the above items. (New Issue)
☐	37	Provide the cross-sections for the proposed street to show the horizontal separation between proposed wet utilities. (New Issue)
☐	39	Provide EMRA for all proposed sewer mains and laterals in the public right-of-way and easement. (New Issue)

sewer study comments:

Cleared?	Issue Num	Issue Text
☐	40	We have reviewed the subject sewer study dated July 12, 2018. The Water and Sewer Development Review Section has the following comments: (New Issue)

Cleared?	Issue Num	Issue Text
☐	41	Please provide the sewer exhibit with the proposed sewer mains and proposed manholes numbers. (New Issue)
☐	42	a.Show and label all existing sewer mains include size, material and drawing number. b.Show the direction of flow. c.Clearly label the proposed sewer as private or public. d.Provide the depth of the proposed manholes. (New Issue)
☐	43	Provide the Manhole to Manhole Calculations Table for all proposed sewer reaches. Please use peaking wet weather factor equal 1. (New Issue)
☐	44	The proposed flow should be calculated in accordance with the Current Sewer Design Guide Section 1.8. Currently the basis conversion 1 EDU - 280gallon per day (not 240 gallon per day you use). (New Issue)
☐	45	All proposed sewer mains onsite should be label as private. In accordance with California Plumbing Code the minimum design slope for the sewer mains should be 1%. Please redesign sewer reaches which does not meet the above requirements. (New Issue)
☐	46	Clearly label the point of connection to the existing sewer main. The proposed development connects to existing 10" sewer main in Ocean View Hills Parkway. Please evaluate the existing 10" sewer main in Ocean View Hills Parkway until flow from your project is 10% of the total flow of the existing main. (New Issue)
☐	47	Include items 37 and 38 in the sewer study exhibit. (New Issue)
☐	48	Please provide two bound copies and PDF of the revised sewer study stamped and signed by a California registered Civil Engineer. (New Issue)

Existing peak wet weather sewer flows to SPS 23T are currently 800 gallons per minute (1.2 million gallons per day (mgd)), as reported by MWWD. Future flows to the pump station are based on projected development as noted in Section 1. Industrial development is likely to occur based on one of the three scenarios presented in the 2006 ERA report. The sewer generation rates for each of the scenarios were calculated and are presented in Table 4. Of the three scenarios, the Medium Scenario with high tech industrial land uses is likely to use the most water and therefore have the largest sewer generation rate. However, based on discussions with City Planning and Economic Development staff, it is most likely that the High Scenario, with low water use, warehouse type buildings similar to current development on the mesa, will occur.

Table 4
Projected City Industrial Sewer Flows through 2030

Scenario	Assumed Absorption through 2030 (Net Acres)	Recommended Average Generation Rate (gpd/net-acre)	Estimated 2030 Average Sewage Generation	Estimated 2030 Peak Sewage Generation [4]
Low	762	1,000[1]	0.76 mgd	1.5 mgd
Medium	958	1,500[2]	1.44 mgd	2.8 mgd
High	1,269	865[3]	0.95 mgd	2.1 mgd

[1] Based on 65% return to sewer from average of OWD billing with outliers removed
[2] Based on 65% return to sewer from average plus 1 std deviation of OWD billing with outliers removed
[3] Based on 75% return to sewer from average of OWD raw billing data
[4] Peaking factor = 1.9 based on City of San Diego MWWD design guidelines

Using the High Scenario, the existing and projected 2030 tributary flows to SPS 23T, including County flows, are estimated to total 5.0 mgd as shown in Table 5. The High Scenario was assumed because it has the largest number of developed acres with an average sewer generation rate similar to the generation rates seen on Otay Mesa to date.

Table 5
Estimated Peak Flows to SPS 23T in 2030

Source of Sewer Flows	Estimated Peak Wet - Weather Sewer Flow
Existing Flow to SPS 23T	1.2 mgd
East Otay Mesa (County) Peak Flows to SPS 23T [1]	1.7 mgd
Subtotal	**2.9 mgd**
High Scenario – Industrial Development	2.1 mgd
Total	**5.0 mgd**

[1] County sewer flows to SPS 23T are estimated to be an average of 1.8 mgd at buildout, based on the East Otay Mesa Sewer Master Plan, November 2006. Assumed 50 percent buildout of County property in 2030 and 1.9 peaking factor. (1.8 mgd x 0.5 x 1.9 = 1.7 mgd)

APPENDIX C

ONSITE SEWER ANALYSIS AND OFFSITE SEWER ANALYSIS IN THE EXISTING 10-INCH LINE IN CALIENTE AVENUE AND OCEAN VIEW HILLS PARKWAY AND AS-BUILT DRAWINGS

DATE: 10/19/2018

SEWER STUDY SUMMARY

FOR: PA61 City of San Diego; Proposed Flows in Caliente Avenue and Ocean View Hills Parkway (w/ PWWF) SHT 1 OF 1

JOB NUMBER: 648-032 BY: Dexter Wilson Engineering REFER TO PLAN SHEET: NA

FROM	TO	AVG. DRY WEATHER FLOW (gpd)	PDWF PEAKING FACTOR	PDWF (gpd)	PWWF PEAKING FACTOR*	PWWF (gpd)	COMBINED PEAK FLOW (DESIGN FLOW) M.G.D.	COMBINED PEAK FLOW (DESIGN FLOW) C.F.S.	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)
M.H. 1	M.H. 58	90,475	2.45	221,676	1.90	421,184	0.421	0.652	10	0.50	0.194834	0.37500	0.45	0.3428	2.74
M.H. 58	M.H. 57	90,475	2.45	221,676	1.90	421,184	0.421	0.652	10	0.50	0.194834	0.37500	0.45	0.3428	2.74
M.H. 57	M.H. 56	90,475	2.45	221,676	1.90	421,184	0.421	0.652	10	0.50	0.194834	0.37500	0.45	0.3428	2.74

FOR: PA61 City of San Diego; Proposed Flows in Caliente Avenue and Ocean View Hills Parkway (wo/ PWWF) SHT 1 OF 1

JOB NUMBER: 648-032 BY: Dexter Wilson Engineering REFER TO PLAN SHEET: NA

FROM	TO	AVG. DRY WEATHER FLOW (gpd)	PDWF PEAKING FACTOR	PDWF (gpd)	PWWF PEAKING FACTOR*	PWWF (gpd)	COMBINED PEAK FLOW (DESIGN FLOW) M.G.D.	COMBINED PEAK FLOW (DESIGN FLOW) C.F.S.	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)
M.H. 1	M.H. 58	90,475	2.45	221,676	1.00	221,676	0.222	0.343	10	0.50	0.102544	0.26667	0.32	0.2167	2.28
M.H. 58	M.H. 57	90,475	2.45	221,676	1.00	221,676	0.222	0.343	10	0.50	0.102544	0.26667	0.32	0.2167	2.28
M.H. 57	M.H. 56	90,475	2.45	221,676	1.00	221,676	0.222	0.343	10	0.50	0.102544	0.26667	0.32	0.2167	2.28

Min Slope
0.50

Max dn/D
0.45

*Source: Otay Mesa Trunk Sewer Master Plan (see Appendix B)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

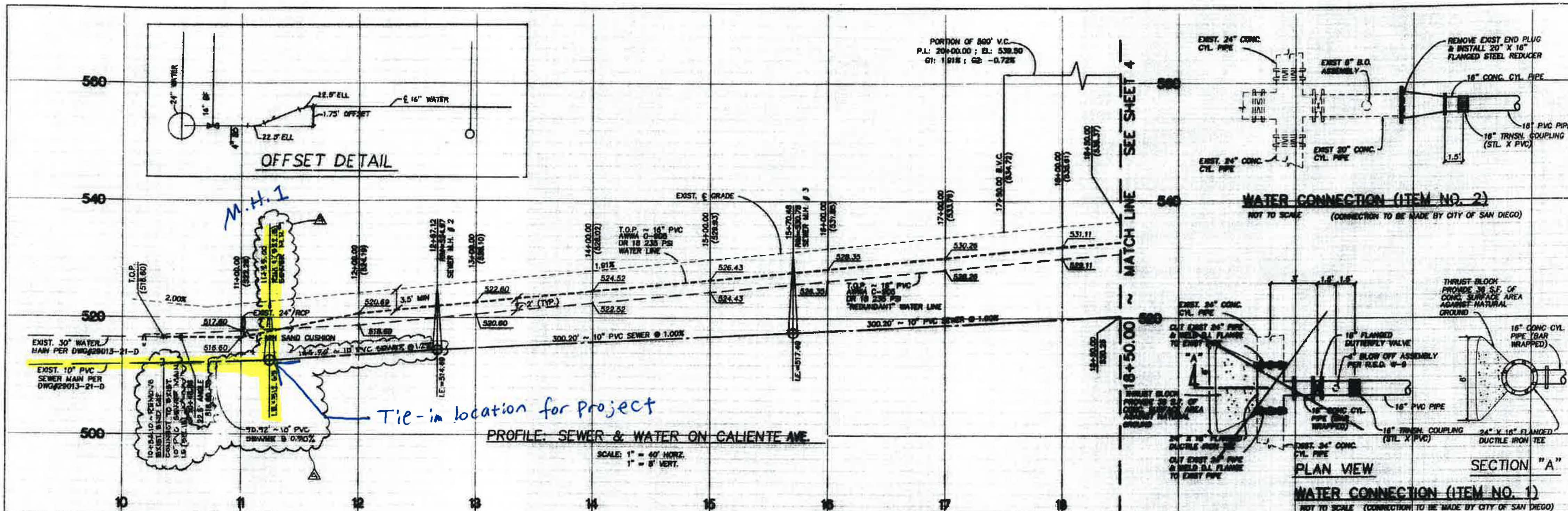
SEWER STUDY SUMMARY

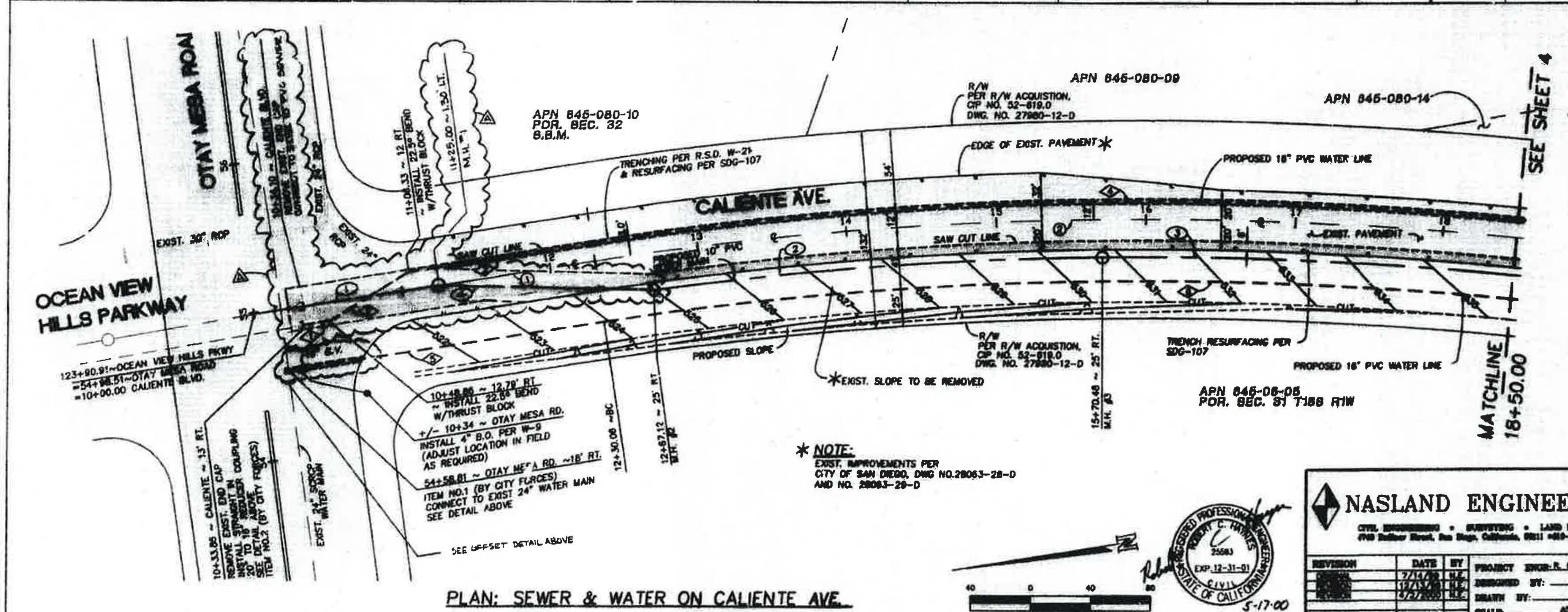
DATE: 10/19/2018 FOR: PA61 Sewer Study (Proposed Flows; Onsite) SHT 1 OF 1

JOB NUMBER: 648-032 BY: Dexter Wilson Engineering, Inc. REFER TO PLAN SHEET: Exhibit A

FROM MH #	TO MH #	IN-LINE EDUs	AVG. DRY WEATHER FLOW (gpd)	PDWF PEAKING FACTOR	PDWF (gpd)	PEAK FLOW (DESIGN FLOW) M.G.D.	PEAK FLOW (DESIGN FLOW) C.F.S.	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)
20	24	5,156	5,156	3.60	18,556	0.019	0.029	8	1.00	0.011005	0.07084	0.106	0.0447	1.44
24	23	1,355	6,511	3.49	22,710	0.023	0.035	8	1.00	0.013468	0.07797	0.117	0.0514	1.54
23	22	5,156	11,667	3.23	37,630	0.038	0.058	8	1.00	0.022317	0.09959	0.149	0.0735	1.78
22	21	5,156	16,823	3.07	51,659	0.052	0.080	8	1.00	0.030637	0.11618	0.174	0.0917	1.96
21	7	5,156	21,979	2.96	65,113	0.065	0.101	8	0.87	0.041401	0.13460	0.202	0.1133	2.00
7	6	47,625	69,604	2.54	176,648	0.177	0.273	8	0.40	0.165647	0.27551	0.413	0.3064	2.01
6	5	5,156	74,760	2.51	187,923	0.188	0.291	8	0.38	0.180797	0.28924	0.434	0.3267	2.00
5	4	0	74,760	2.51	187,923	0.188	0.291	8	0.38	0.180797	0.28924	0.434	0.3267	2.00
4	3	15,715	90,475	2.45	221,676	0.222	0.343	10	0.35	0.122564	0.29263	0.351	0.2461	2.01
3	2	0	90,475	2.45	221,676	0.222	0.343	10	0.35	0.122564	0.29263	0.351	0.2461	2.01
2	1	0	90,475	2.45	221,676	0.222	0.343	10	0.35	0.122564	0.29263	0.351	0.2461	2.01
34	15	5,156	5,156	3.60	18,556	0.019	0.029	8	1.00	0.011005	0.07084	0.106	0.0447	1.44
15	14	0	5,156	3.60	18,556	0.019	0.029	8	1.00	0.011005	0.07084	0.106	0.0447	1.44
14	13	5,156	10,312	3.28	33,815	0.034	0.052	8	1.00	0.020055	0.09457	0.142	0.0681	1.73
13	12	5,156	15,468	3.11	48,036	0.048	0.074	8	1.00	0.028489	0.11213	0.168	0.0872	1.92
12	11	5,156	20,624	2.99	61,623	0.062	0.095	8	0.91	0.038311	0.12952	0.194	0.1073	2.00
11	10	2,578	23,202	2.94	68,238	0.068	0.106	8	0.84	0.044156	0.13898	0.208	0.1187	2.00
10	9	2,578	25,780	2.90	74,756	0.075	0.116	8	0.78	0.050200	0.14815	0.222	0.1300	2.00
9	0	2,578	28,358	2.86	81,186	0.081	0.126	8	0.73	0.056354	0.15702	0.236	0.1411	2.00
8	7	19,267	47,625	2.67	127,182	0.127	0.197	8	0.51	0.105620	0.21647	0.325	0.2211	2.00
28	26	5,156	5,156	3.60	18,556	0.019	0.029	8	1.00	0.011005	0.07084	0.106	0.0447	1.44
26	25	5,156	10,312	3.28	33,815	0.034	0.052	8	1.00	0.020055	0.09457	0.142	0.0681	1.73
25	8	5,156	15,468	3.11	48,036	0.048	0.074	8	1.00	0.028489	0.11213	0.168	0.0872	1.92
150	110	5,156	5,156	3.60	18,556	0.019	0.029	8	5.00	0.004921	0.04833	0.072	0.0255	2.53
152	114	5,156	5,156	3.60	18,556	0.019	0.029	8	5.00	0.004921	0.04833	0.072	0.0255	2.53
154	116	5,156	5,156	3.60	18,556	0.019	0.029	8	5.00	0.004921	0.04833	0.072	0.0255	2.53
156	118	5,156	5,156	3.60	18,556	0.019	0.029	8	3.00	0.006354	0.05456	0.082	0.0304	2.12
158	128	5,156	5,156	3.60	18,556	0.019	0.029	8	7.00	0.004159	0.04462	0.067	0.0227	2.85
160	144	5,156	5,156	3.60	18,556	0.019	0.029	8	5.00	0.004921	0.04833	0.072	0.0255	2.53
162	132	2,578	2,578	3.95	10,182	0.010	0.016	8	1.00	0.006039	0.05333	0.080	0.0294	1.21
164	134	5,156	5,156	3.60	18,556	0.019	0.029	8	2.00	0.007782	0.06011	0.090	0.0351	1.84
166	136	5,156	5,156	3.60	18,556	0.019	0.029	8	2.00	0.007782	0.06011	0.090	0.0351	1.84
168	138	5,156	5,156	3.60	18,556	0.019	0.029	8	1.00	0.011005	0.07084	0.106	0.0447	1.44

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D





EXIST. CENTERLINE DATA				
NO.	BEARING/DELTA	RADIUS	LENGTH	REMARKS
(1)	N00°18'20"E	----	230.08'	CALIENTE BLVD
(2)	D=14°47'10"	2400.00'	619.36'	CALIENTE BLVD

SEWER DATA				
NO.	BEARING/DELTA	RADIUS	LENGTH	REMARKS
(1)	N 0°59'46" W	----		10" PVC
(2)	D=07°14'32"	2375.00'	300.20'	10" PVC
(3)	D=06°38'35"	2375.00'	276.04'	10" PVC
(4)	N 10° 59' 51" E		164.20'	10" PVC

WATER DATA				
NO.	BEARING/DELTA	RADIUS	LENGTH	REMARKS
<1>	N00°31'38"W	----	15.00'	16" PVC DR 18 235 PSI
<2>	N23°01'38"W	----	62.58'	16" PVC DR 18 235 PSI
<3>	N00°18'20"E	----	123.74'	16" PVC DR 18 235 PSI
<4>	D=14°46'53"	2412.00'	622.25'	16" PVC DR 18 235 PSI
<5>	N00°18'20"E	----	166.72'	16" PVC DR 18 235 PSI
<6>	D=14°46'12"	2356.00'	609.48'	16" PVC DR 18 235 PSI

NASLAND ENGINEERING
CIVIL ENGINEERING • SURVEYING • LAND PLANNING

REVISION	DATE	BY
	7/14/99	N.E.
	12/13/99	N.E.
	4/7/2000	N.E.

PROJECT ENGR: R. C. HAYNES
DESIGNED BY: D. BAUGH
DRAWN BY: D. BAUGH
SCALE: AS SHOWN
JOB NO. 195-295.2

ROBERT C. HAYNES 25563 EXP. 12-31-01 CIVIL STATE OF CALIFORNIA
5-17-00

PRIVATE CONTRACT
IMPROVEMENT PLANS FOR:

CALIENTE AVENUE

STA. 10+00.00 TO STA. 18+50.00

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 3 OF 14 SHEETS
5/27/00

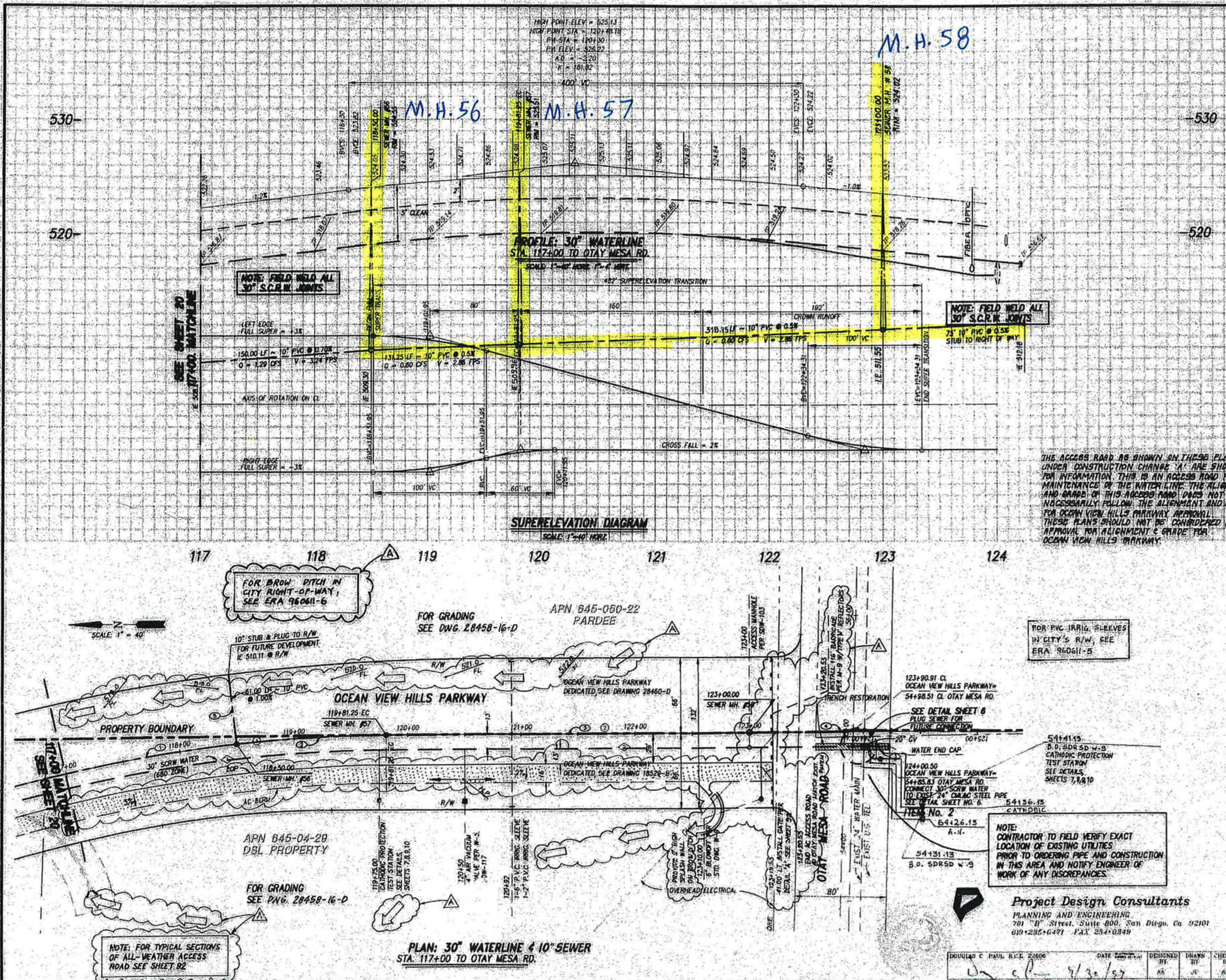
W.O. NO. 990675

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	N.E.			
CHANGE "A"	N.E.			
AS-BUILT				

1786-6271
146-1761
30072-3-D

CHANGE "A" ~ RE-LOCATE SEWER M.H.#1 ~ REVISE PLAN & PROFILE ~ REVISE DATA TABLE

AS BUILT



CENTER LINE DATA				
NO.	DELTA OR BRG	RADIUS	LENGTH	REMARKS
1	12°23'45"	1300.00	281.25'	CL OCEAN VIEW HILLS PKWY
2	N00°30'44"W		409.66'	"

WATER DATA				
NO.	DELTA OR BRG	RADIUS	LENGTH	REMARKS
1	12°23'45"	1287.00	278.44'	30" SCRW CLASS 150
2	N00°30'44"W		419.25'	"
3	N01°19'06"E		22.40'	20" PVC

SEWER DATA				
NO.	DELTA OR BRG	RADIUS	LENGTH	REMARKS
1	6°36'53"	1300.00	150.00'	10" PVC
2	5°47'05"	1300.00	131.25'	"
3	N00°30'44"W		318.75'	"
4	N00°30'44"W		125.00'	"
5	N83°05'13"E		61.00'	"

PRIVATE CONTRACT

IMPROVEMENT PLANS FOR:

10" SEWER AND 30" WATERLINE

IN OCEAN VIEW HILLS PARKWAY
CALIFORNIA TERRACES NORTH PHASE UNIT 1

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 21 OF 92 SHEETS

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	PDC			
CHANGE	PDC			
AS-BLT	P.D.C.		9/01/04	

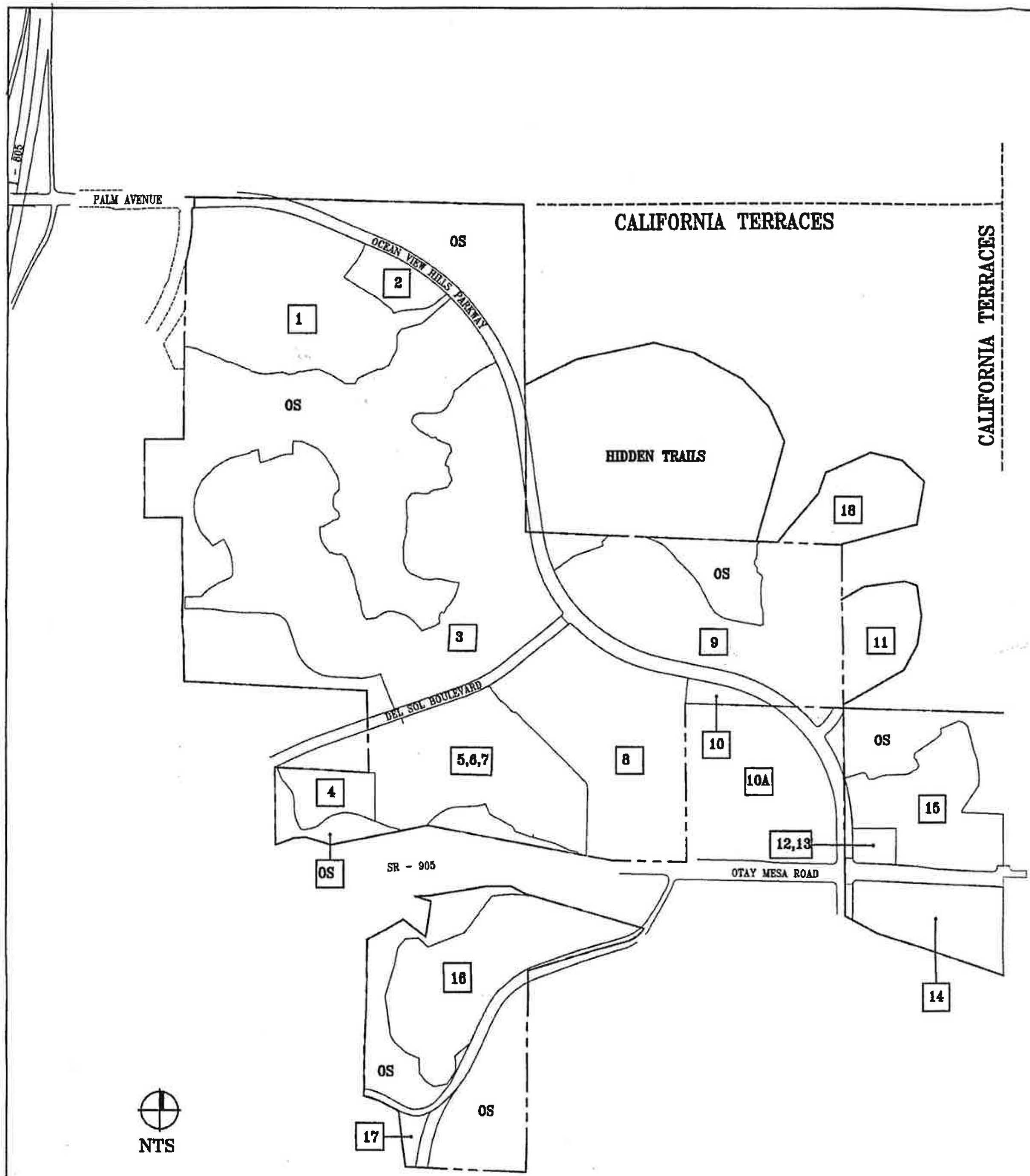
CONTRACTOR PARDEE CONST. DATE STARTED 9/1/97
INSPECTOR RICK SKINNER DATE COMPLETED 01/30/04

29013-21-D

CHANGE – ADD ALL WEATHER ACCESS ROAD APP ERA NOTE

APPENDIX D

CALIFORNIA TERRACES SEWER BASIN EXHIBIT
(APPROVED EDU COUNT)



CALIFORNIA TERRACES SEWER BASIN
APPROVED SEWER REPORT TM 86-1032

No.	EDU'S BUILT OR PLANNED	EDU'S APPROVED PER CALIFORNIA TERRACES SEWER REPORT TM 86-1032
1	235	192
2	44	89
3	452	562
4	192	192
5,6,7	129	129
8	1578	1539
9	289	279
10	26	26
10A	304	304
11	372	372
12,13	31	31
14	199	199
15	644	760
16	179*	182
17	40*	40
18	300	300
HIDDEN TRAILS	474	750
SAN YSIDRO HIGH SCHOOL	25	
TOTAL EDU'S IN SEWER BASIN	5294	5946

* AREAS 16 AND 17 CURRENTLY SEWER TO THE SOUTH AND ARE NO LONGER IN THE CALIFORNIA TERRACES SEWER BASIN. THEREFORE THEY ARE NOT INCLUDED IN THE TOTAL EDU'S BUILT OR PLANNED AND ARE JUST FOR REFERENCE.

REGISTERED PROFESSIONAL ENGINEER
CURTIS J. TURNER
No. 59285
Exp. 6/30/09
CIVIL
STATE OF CALIFORNIA

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Environmental | Engineering | Survey
701 B Street, Suite 800
San Diego, CA 92101
619.235.6471 Tel
619.234.0349 Fax

CURTIS J. TURNER, R.C.E. 59285	DATE	REGISTRATION EXPIRES 06-30-09	DESIGNED BY:	PM REVIEW:	SURVEY REVIEW:
Curtis J Turner	10-23-08		GP	CT	

EXHIBIT A
GRAVITY SEWER MANHOLE AND PIPE DIAGRAM
PA61

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

\\ARTIC\DWG\648032\SEWER\PA61_SWR_EXHIBITA_ONSITE_CMH.DWG 10-18-18 09:38:11 LAYOUT: LAYOUT

California Terraces PA 61 (Mixed-Use)
City of San Diego (PTS 605191)
Southeast corner of Otay Mesa Rd and Caliente Ave
April 12, 2018
Fifth Revision January 14, 2019

Transportation Impact Analysis

Prepared for:

Pardee Homes
13400 Sabre Springs Pkwy #200
San Diego, CA 92128

REGISTERED PROFESSIONAL ENGINEER
JUSTIN P. RASAS
NO. TR 2135
EXP. 3/31/2020
TRAFFIC
STATE OF CALIFORNIA

SEALED ON 1/17/2019

Prepared by Justin Rasas (TR 2135) a principal with:

LOS Engineering, Inc.
11622 El Camino Real, Suite 100, San Diego, CA 92130
Phone 619-890-1253

Job #1727

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Executive Summary
California Terraces PA 61 Mixed-Use Project

The proposed California Terraces PA 61 is a mixed-use project with 171 to 267 multi-family units, up to 45,000 sf of commercial/retail space, and a 0.19 acre private park located on the southeast corner of Otay Mesa Road and Caliente Avenue in the Otay Mesa community of San Diego, California. The project is anticipated to open in year 2020. The site is currently vacant. The project requires a Community Plan Amendment (CPA) to re-designate the approximately 14-acre site from Community Commercial – Residential Prohibited (CC-2-3) to Community Commercial – Residential Permitted Rezone for the eastern portion of the property from CC-1-3 to RM-2-5, and to reclassify Caliente Avenue from Otay Mesa Road to SR-905 WB Ramp from a six-lane Prime to a five-lane Prime. The following discretionary approvals are required as part of the project:

1) Vesting Tentative Map
2) Site Development Permit
3) Master Planned Development Permit
4) Neighborhood Development Permit
5) Community Plan Amendment Land Use and Roadway Classification
6) Street Vacation and Rezone

The project's expected traffic generation was calculated using trip rates from the City of San Diego *Trip Generation Manual*, May 2003. Two trip generation rates were applied: a driveway rate for project access points and the intersection of Caliente Avenue/Otay Mesa Road and a cumulative rate (accounts for primary and diverted trips) that was applied for all other analyzed locations. The project driveway volumes (with 267 MF units, 45,000 sf commercial, and 0.19 acre park) were calculated at 6,816 ADT with 336 AM peak hour trips (152 inbound and 184 outbound) and 717 PM peak hour trips (387 inbound and 330 outbound). The cumulative traffic volumes were calculated at 4,716 ADT with 252 AM peak hour trips (101 inbound and 151 outbound) and 486 PM peak hour trips (271 inbound and 215 outbound).

As part of this transportation impact study, six scenarios were analyzed, which included Existing, Existing with Project, Near-term Year 2020 without Project, Near-term Year 2020 with Project (Opening Day), Horizon Year 2062 without Project, and Horizon Year 2062 with Project Conditions. Operational findings and project impacts by scenario are summarized below:

1) Under existing conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersection of Caliente Avenue at Airway Road (LOS F AM). The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

2) Under existing with project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersections of:
   i. Caliente Avenue at SR-905 WB Ramp (LOS E PM),
   ii. Caliente Avenue at Airway Road (LOS F AM), and
   iii. Otay Mesa Road at Emerald Crest Ct (LOS F PM).

The project is calculated to have direct impacts at all three of the above intersections. The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

The intersection of Caliente Ave/SR-905 WB Ramp is identified in the Otay Mesa Community Plan Update (CPU) Final EIR as a significant and unmitigated impact at community buildout resulting in the adoption of overriding considerations. Under Existing Plus Project Conditions, the applicant is proposing mitigation to reduce the direct impact at this intersection to below significance through restriping the southbound approach of two through and one through-right turn lane (3 total approach lanes) to one through, one through-right, and one right turn lane (3 total approach lanes). The proposed restriping is an interim improvement until the City Public Facilities Financing Plan (PFFP) OM T-11.1 is completed (currently scheduled for 2026), which will add an additional southbound right turn lane from Caliente Ave to SR-905 WB Ramp resulting in 4 total approach lanes. The interim mitigation would reduce the significant impact at this intersection to less than significant. Prior to issuance of the first building permit, owner/permittee shall restripe the southbound approach to include a through lane, a through-right turn lane, and right turn lane satisfactory to the City Engineer and Caltrans.

The intersection of Caliente Ave/Airway Rd is also identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout resulting in the adoption of overriding considerations. The project proposes mitigation for reduction of this significant impact through the installation of signal at this intersection. It is noted that this intersection is also identified to be signalized as part of the Candlelight VTM Mitigation Monitoring and Reporting Program (MMRP) and Southview. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.

The intersection of Otay Mesa Rd/Emerald Crest Court/Street B with full turning movements allowed requires a traffic signal to reduce the direct impact to below a level of significance. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational. The signal could be completed by either the adjacent Handler commercial project or by Garden Communities as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007 and secured by a $162,000 bond. The signal will be installed prior to the project's first occupancy in order to mitigate this project's direct impact.

Project features include the construction of a full width raised median along the project frontage on Caliente Avenue, removal of the existing K-rail and replacement with a full width raised median along the project frontage on Otay Mesa Road, construction of two public cul-de-sac streets, construction of a 6-foot non-contiguous sidewalk along Otay Mesa Road, and replacement of the sidewalk along Caliente Ave with a 6-foot non-contiguous sidewalk along the project frontage.

3) Under Near Term 2020 (opening day) without project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersections of:
   i. Caliente Avenue at SR-905 WB Ramp (LOS E PM), and
   ii. Caliente Avenue at Airway Road (LOS F AM and PM).

   The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

4) Under Near Term 2020 (opening day) with project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersections of:
   i. Caliente Avenue at SR-905 WB Ramp (LOS E PM),
   ii. Caliente Avenue at Airway Road (LOS F AM), and
   iii. Otay Mesa Road at Emerald Crest Ct (LOS F PM).

   <u>The project is calculated to have direct impacts at all three of the above intersections</u>. The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

   The intersection of Caliente Ave/SR-905 WB Ramp is identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout resulting in the adoption of overriding considerations. Under the Near Term, the applicant is proposing mitigation to reduce the direct impact at this intersection to below significance through restriping the southbound approach of two through and one through-right turn lane (3 total approach lanes) to one through, one through-right, and one right turn lane (3 total approach lanes). The proposed restriping is an interim improvement until the City Public Facilities Financing Plan (PFFP) OM T-11.1 is completed (currently scheduled for 2026), which will add an additional southbound right turn lane from Caliente Ave to SR-905 WB Ramp resulting in 4 total approach lanes. The interim mitigation would reduce the significant impact at this intersection to less than significant. Prior to issuance of the first building permit, owner/permittee shall restripe the southbound approach to include a through lane, a through-right turn lane, and right turn lane satisfactory to the City Engineer and Caltrans.

   The intersection of Caliente Ave/Airway Rd is also identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout resulting in the adoption of overriding considerations. The project proposes mitigation for reduction of this significant impact through the installation of signal at this intersection. It is noted that this intersection is also identified to be signalized as part of the Candlelight VTM Mitigation Monitoring and Reporting Program (MMRP) and Southview. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.

   The intersection of Otay Mesa Rd/Emerald Crest Court/Street B with full turning movements allowed requires a traffic signal to reduce the project's direct impact to below a level of significance. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational. The signal could be completed by either the adjacent Handler commercial project or by Garden Communities as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007 and secured by a

$162,000 bond. The signal will be installed prior to the project's first occupancy in order to mitigate this project's direct impact.

5) Under Horizon Year 2062 without project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for:
   i. Intersection of Caliente Avenue at SR-905 WB Ramp (LOS F PM),
   ii. Intersection of Caliente Avenue at Airway Road (LOS F AM & PM),
   iii. Segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp (LOS F),
   iv. Segment of Caliente Ave between SR-905 WB Ramp and SR-905 EB Ramp (LOS E),
   v. Segment of Caliente Ave between SR-905 EB Ramp and Airway Rd (LOS E), and
   vi. SR-905 between Caliente Ave and Britannia Blvd (LOS E AM EB & PM WB).

   The metered freeway on-ramps were calculated to operate with significant delays (WB AM 10 minutes & WB PM 47.5 minutes, which exceeds acceptable operations. The receiving WB segment of SR-905 between I-805 and Caliente Ave is calculated to operate at acceptable LOS B AM and LOS D PM) or no delay (EB AM & PM). Please note that the reported WB on-ramp delay is excessive and the calculation may be beyond the range of reliability; however, the standard of practice calculation was used.

6) Under Horizon Year 2062 with project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for:
   i. Intersection of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave (LOS E PM),
   ii. Intersection of Caliente Avenue/SR-905 WB Ramp (LOS F PM),
   iii. Segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp (LOS F),
   iv. Segment of Caliente Ave between SR-905 WB Ramp and SR-905 EB Ramp (LOS E),
   v. Segment of Caliente Ave between SR-905 EB Ramp and Airway Rd (LOS E), and
   vi. SR-905 between Caliente Ave and Britannia Blvd (LOS E AM EB & PM WB).

   The metered freeway on-ramp at SB SR-905/Caliente Avenue WB was calculated to operate with significant delays (11.9 minutes AM and 50.2 minutes PM); however, the project did not result in a significant impact to the metered on-ramps because the downstream freeway operations are expected to be at LOS D or better. The Otay Mesa CPU EIR also documented delays in excess of 15 minutes at the Caliente Avenue WB on-ramp in conjunction with downstream freeway operations of unacceptable LOS E or F conditions based on an analysis from 2012 that used traffic counts and forecasting data in SANDAG Series 11. The reported WB on-ramp delay is excessive and may be beyond the range of reliability; however, the standard of practice calculation was used.

   <u>The project is calculated to have five cumulative (horizon year) impacts at</u>
   1) Intersection of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave (LOS E PM),
   2) Intersection of Caliente Avenue/SR-905 WB Ramp (LOS F PM),
   3) Intersection of Caliente Avenue at Airway Road (LOS F AM & PM),
   4) Intersection of Otay Mesa Road at Emerald Crest Court (LOS F PM), and
   5) Segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp (LOS F).

   The two other segments of Caliente Avenue with unacceptable LOS (SR-905 WB Ramp to SR-905 EB Ramp and SR-905 EB Ramp to Airway Rd) do not have cumulative impacts because the project traffic does not exceed the City of San Diego traffic impact significance thresholds.

The intersection of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave is identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout. This impact was found to remain significant and unmitigated and a Statement of Overriding Considerations was adopted by the City. The applicant is proposing mitigation to reduce the significant impact at this intersection to below significance through bonding for the restriping of the westbound approach from four approach lanes (left, left, through, right) to five approach lanes (left, left, left, through-right, right) satisfactory to the City Engineer. However, if not implemented in the Horizon Year, then the impact would not be mitigated consistent with the Otay Mesa CPU EIR Overriding Considerations.

The intersection of Caliente Ave/SR-905 WB Ramp is identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout. This impact was found to remain significant and unmitigated and a Statement of Overriding Considerations was adopted by the City. The applicant is proposing mitigation to reduce the significant impact at this intersection to below significance. Prior to issuance of the first building permit, owner/permittee shall make a fair share contribution of 8.8% toward PFFP OM T-11.1 that includes the construction of an additional southbound right turn lane satisfactory to the City Engineer. However, if the PFFP is not fully funded by Horizon Year, then the impact would not be mitigated consistent with the Otay Mesa CPU EIR.

The intersection of Caliente Ave/Airway Rd is also identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout. The project proposes mitigation for reduction of its direct and cumulative impact through the installation of signal at this intersection. This intersection is also identified to be signalized as part of the Candlelight VTM MMRP and Southview. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.

The intersection of Otay Mesa Rd/Emerald Crest Court/Street B with full turning movements allowed requires a traffic signal to reduce the project's direct and cumulative impact to below a level of significance. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational. The signal could be completed by either the adjacent Handler commercial project or by Garden Communities as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007 and secured by a $162,000 bond.

The cumulative segment impact on Caliente Avenue would be reduced to below a level of significance through the project's construction of a raised median along the project frontage. Prior to issuance of the first building permit, owner/permittee shall construct a full width raised median on Caliente Avenue from Otay Mesa Rd to SR-905 WB Ramp, satisfactory to the City Engineer.

In addition to the proposed mitigation measures noted above, the applicant proposes the following project features:

1) Construct Street A to full width (public cul-de-sac extending south from Otay Mesa Rd) located approximately 500 feet east of Caliente Avenue (centerline to centerline) with right-in/right-out only access and a right turn deceleration lane on Otay Mesa Road (deceleration lane required to allow access from a primary arterial).

2) Construct Street B to full width (public cul-de-sac extending south from Otay Mesa Rd) located along the eastern project boundary that will align with Emerald Crest Court completing a fourth leg to this existing t-intersection along with a right turn deceleration lane on Otay Mesa Road. Project will remove the existing K-Rail and replace with concrete raised median along with signal installation (as mitigation identified previously).

3) Remove the existing K-Rail with fence on Otay Mesa Road from Caliente Avenue and Emerald Crest Ct and replace with concrete raised median.

4) Construct a full width raised median on Caliente Avenue from Otay Mesa Road to SR-905 WB Ramp.

5) Construct a 6-foot non-contiguous sidewalk along the project frontage on Otay Mesa Road. Replace the existing sidewalk along the project frontage on Caliente Ave with a 6-ft non-contiguous sidewalk that will connect with the existing sidewalk at the Caltrans' ROW.

1.0 Introduction

The proposed California Terraces PA 61 is a mixed-use project with 171 to 267 multi-family units, up to 45,000 sf of commercial/retail space, and a 0.19 acre park located on the southeast corner of Otay Mesa Road and Caliente Avenue in the Otay Mesa community of San Diego, California. The site is currently vacant, graded, and has a perimeter chain link fence. The site is bounded by Otay Mesa Road to the north, Caliente Avenue to the west, State Route-905 (SR-905) to the south, and neighboring property (Handler Commercial Property) to the east. Two points of access are proposed with the project. A right-in/right-out point of access on Otay Mesa Road toward the western end of the project and a full signalized shared access at Otay Mesa Road/Emerald Crest Court. Each of the two access points will have a south leg proposed as a public cul-de-sac as part of this project with a deceleration lane on Otay Mesa Road. The location of the project is shown in **Figure 1** with a preliminary site plan (with 171 units and 45,000 sf commercial) shown in **Figure 2**.

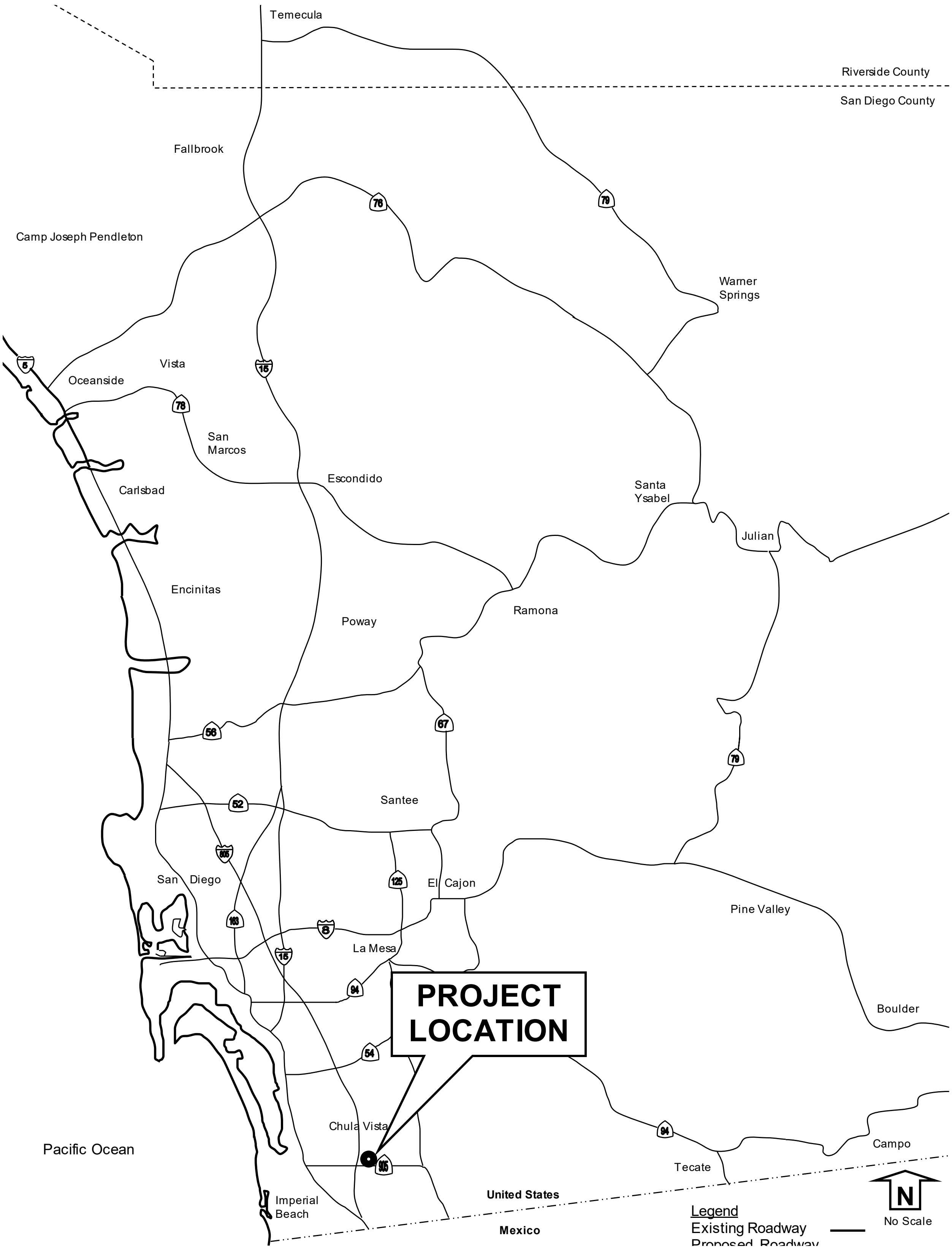
The project requires a Community Plan Amendment (CPA) to re-designate the approximately 14-acre site from Community Commercial – Residential Prohibited to Community Commercial – Residential Permitted Rezone of the eastern portion of the property from CC-1-3 to RM-2-5, and to reclassify Caliente Avenue from Otay Mesa Road to SR-905 WB Ramp from a six-lane Prime to a five-lane Prime. The following discretionary approvals are required as part of the project:

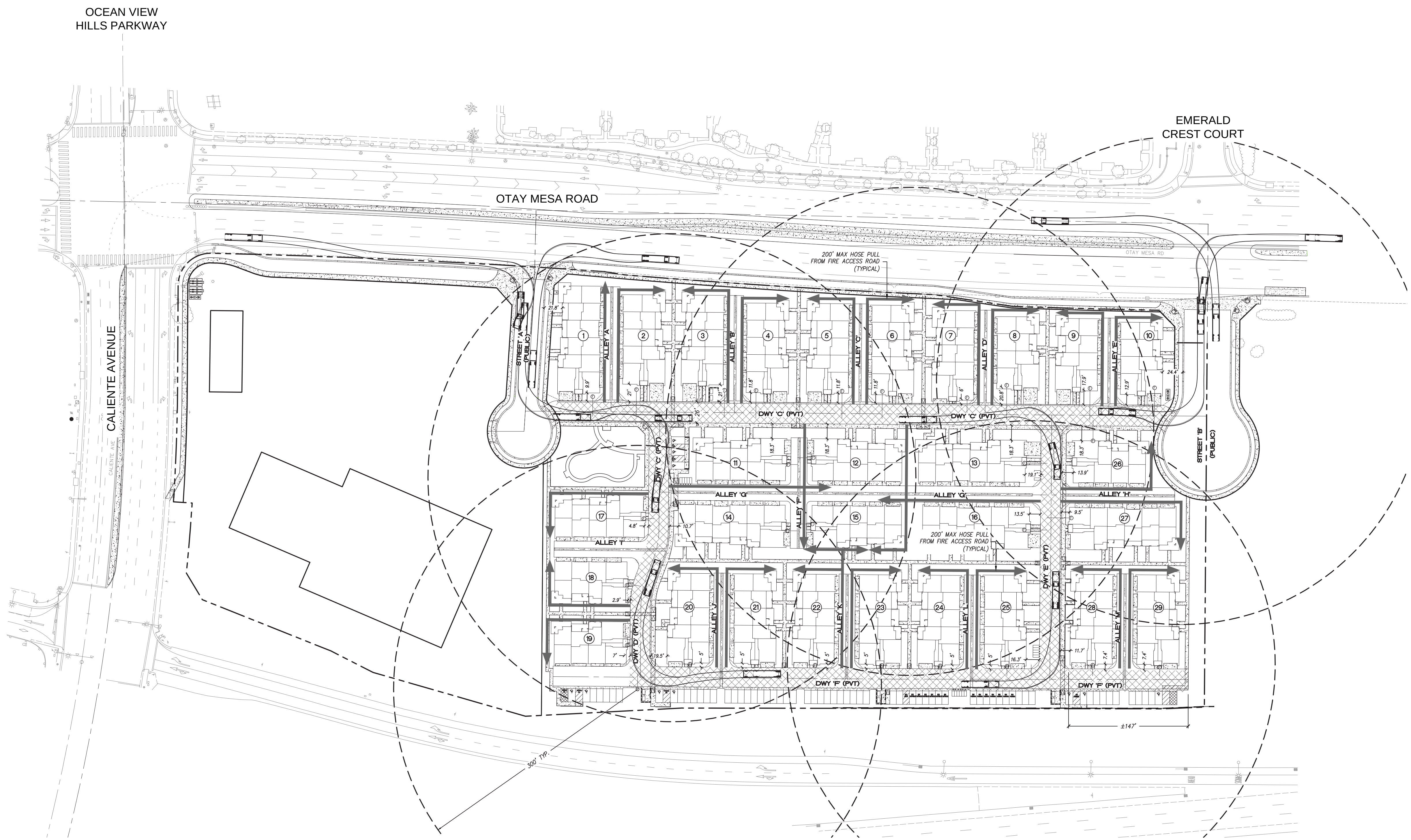
1) Vesting Tentative Map
2) Site Development Permit
3) Master Planned Development Permit
4) Neighborhood Development Permit
5) Community Plan Amendment Land Use and Roadway Classification
6) Street Vacation and Rezone

This report describes the existing roadway network in the vicinity of the project site and includes a review of the existing and proposed conditions for weekday peak AM and PM periods and daily traffic conditions when the project is completed. The Near-Term with Project (Opening Day) is anticipated to be 2020. A horizon year of 2062 represents the anticipated community buildout per the Otay Mesa Community Plan Update EIR. The format of this study includes the following chapters:

- 1.0 Introduction
- 2.0 Study Methodology
- 3.0 Existing Conditions
- 4.0 Project Description
- 5.0 Existing with Project Conditions
- 6.0 Near-Term Year 2020 without Project Conditions
- 7.0 Near-Term Year 2020 with Project (Opening Day) Conditions
- 8.0 Horizon Year 2062 without Project Conditions
- 9.0 Horizon Year 2062 with Project Conditions
- 10.0 Project Impacts and Mitigation Summary
- 11.0 Parking
- 12.0 Transportation Demand Management
- 13.0 On-Site Vehicular and Pedestrian Circulation
- 14.0 Conclusions

Figure 1: Project Location





LEGEND:

(dashed circle)	FIRE HYDRANT SERVICE RADIUS
(hatched band)	PROPOSED FIRE ACCESS ROADWAY. NO PARKING ALLOWED. "FIRE LANE – NO PARKING" SIGNS TO BE INSTALLED AT 150' INTERVALS.
(curve)	FIRE TRUCK TURN
(symbol)	PROPOSED FIRE HYDRANT
(arrow)	200' MAX HOSE PULL TO ALL PORTIONS OF THE EXTERIOR OF BUILDINGS PER POLICY A-14-1

FIRE NOTES:

1. FIRE APPARATUS ACCESS ROADS AND WATER SUPPLIES FOR FIRE PROTECTION, SHALL BE INSTALLED AND MADE SERVICEABLE PRIOR TO AND DURING TIME OF CONSTRUCTION CFC 501.4.
2. CFC 507.5.5 – CLEAR SPACE AROUND HYDRANTS – A 3 FOOT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF FIRE HYDRANTS, EXCEPT AS OTHERWISE REQUIRED OR APPROVED.
3. SAN DIEGO MUNICIPAL CODE SECTION 55.0507 ITEM (C) HYDRANT LOCATIONS SHALL BE IDENTIFIED BY THE INSTALLATION OF REFLECTIVE BLUE COLORED MARKERS. SUCH MARKERS SHALL BE AFFIXED TO THE ROADWAY SURFACE, APPROXIMATELY CENTERED BETWEEN CURBS, AND AT A RIGHT ANGLE TO THE HYDRANT.
4. CFC 507.5.6 – PHYSICAL PROTECTION – IF ADDITIONAL HYDRANTS ARE REQUIRED AND WHERE FIRE HYDRANTS ARE SUBJECT TO IMPACT BY A MOTOR VEHICLE, GUARD POSTS OR OTHER APPROVED MEANS SHALL COMPLY WITH SECTION CC 312.
5. VEGETATION SHALL BE SELECTED AND MAINTAINED IN SUCH A MANNER AS TO ALLOW IMMEDIATE ACCESS TO ALL HYDRANTS, VALVES, FIRE DEPARTMENT CONNECTIONS, PULL STATIONS, EXTINGUISHERS, SPRINKLER RISERS, ALARM CONTROL PANELS, RESCUE WINDOWS, AND OTHER DEVICES OR AREAS USED FOR FIREFIGHTING PURPOSES. VEGETATION OR BUILDING FEATURES SHALL NOT OBSTRUCT ADDRESS NUMBERS OR INHIBIT THE FUNCTIONING OR ALARM BELLS, HORNS OR STROBES.
6. ALL BUILDINGS AND SITES UNDERGOING CONSTRUCTION, ALTERATION, OR DEMOLITION SHALL COMPLY WITH THE REQUIREMENTS OF CHAPTER 33 OF THE CFC.
7. CFC 105.4.4 – CONSTRUCTION DOCUMENTS APPROVED BY THE FIRE CODE OFFICIAL ARE APPROVED WITH THE INTENT THAT SUCH CONSTRUCTION DOCUMENTS COMPLY IN ALL RESPECTS WITH THE CFC. REVIEW AND APPROVAL BY THE FIRE CODE OFFICIAL SHALL NOT RELIEVE THE APPLICANT OF THE RESPONSIBILITY OF COMPLIANCE WITH THIS CODE.
8. FIRE APPARATUS ACCESS ROADS SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS AND SHALL BE SURFACED SO AS TO PROVIDE ALL WEATHER DRIVING CAPABILITIES. CFC 503.2.3.
9. NO ON STREET PARKING ALLOWED ON ALL PRIVATE DRIVEWAYS AND PRIVATE ALLEYS.
10. THE REQUIRED WIDTH OF ACCESS ROADWAYS SHALL NOT BE OBSTRUCTED IN ANY MANNER, INCLUDING THE PARKING OF VEHICLES. WHERE NO SPACE IS PROVIDED FOR PARKING ALONG ACCESS ROADWAYS, THEY SHALL BE KEPT CLEAR BY THE POSTING OF SIGNS OR THE PAINTING OF CURBS PER POLICY A-14-1.

0 25 50 100 150
(IN FEET)
1 inch = 50 ft.

PREPARED BY:

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9/21/18
HENRY H. PENG — DATE
R.C.E. 63686

REGISTERED PROFESSIONAL ENGINEER
HENRY H. PENG
No. 63686
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NAME: CIVIL SENSE, INC.
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PROJECT ADDRESS:
SE CORNER OF OTAY MESA ROAD AND CALIENTE AVENUE

PROJECT NAME:
CALIFORNIA TERRACES - PA61
VTM, SDP, MPDP, NDP, CPA, REZONE AND STREET VACATION

SHEET TITLE:
FIRE PLAN

REVISION 12:	
REVISION 11:	
REVISION 10:	
REVISION 9:	
REVISION 8:	
REVISION 7:	
REVISION 6:	
REVISION 5:	
REVISION 4:	
REVISION 3:	
REVISION 2:	09/19/18
REVISION 1:	07/13/18
ORIGINAL DATE:	04/16/18

SHEET 9 OF 13

DEP #

Figure 2

2.0 Study Methodology

The parameters by which this transportation impact analysis was prepared included the determination of what transportation facilities are to be analyzed, the scenarios to be analyzed and the methods required for analysis. The criteria for each of these parameters are included herein.

2.1 Study Area Criteria

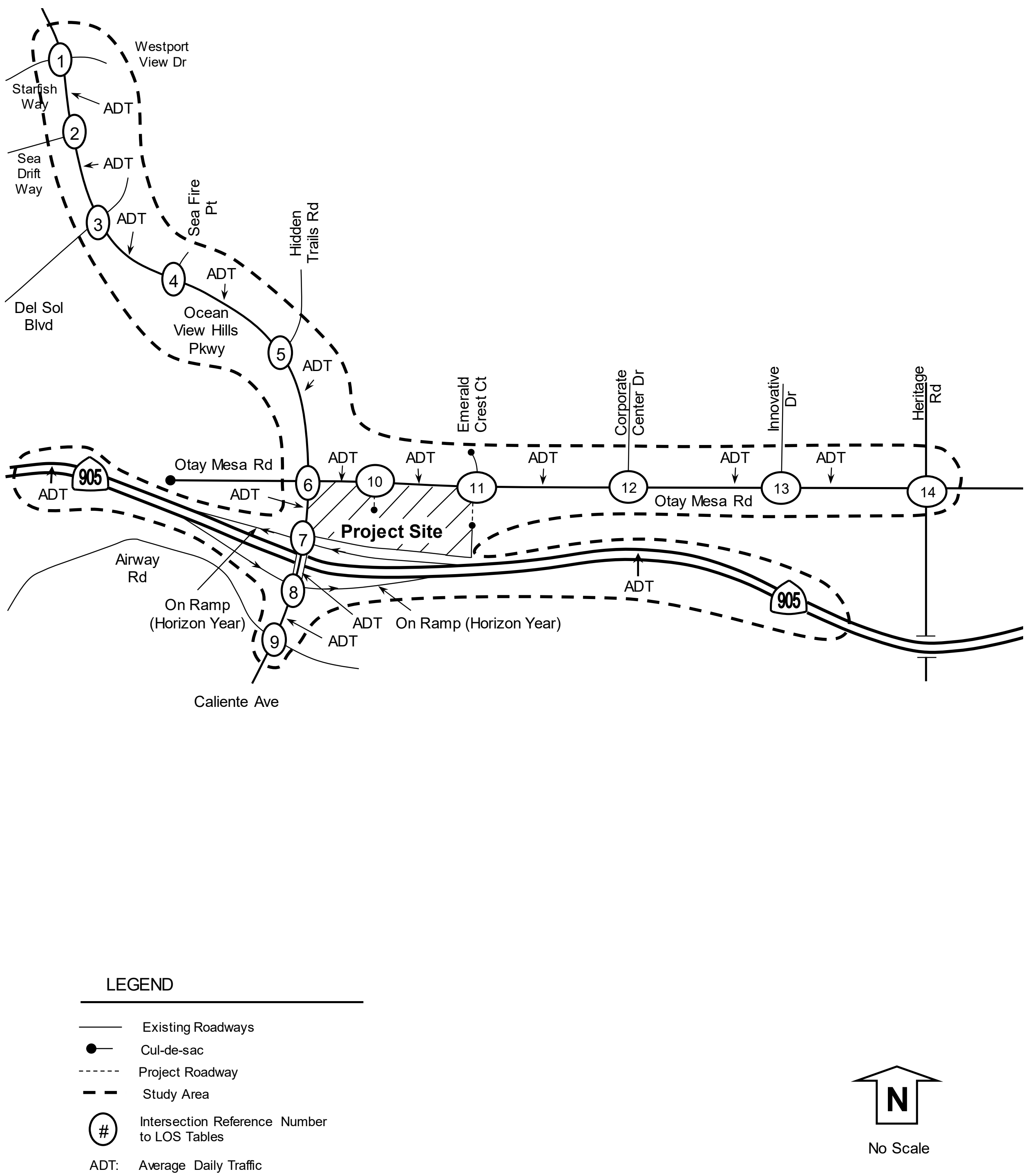
The project study area was determined by the limits or extent of where 50 directional peak hour project trips would use streets and intersections, where 150 directional peak hour trips would use freeway segment, and where 20 directional peak hour trips would use metered freeway on-ramps, which are based on City of San Diego *Traffic Impact Study Manual*, July 1998. Study intersection, roadways, and freeway segments are shown on **Figure 3.** Based on the above limits of directional trips, the study area included the following intersections:

1) Ocean View Hills Pkwy/Starfish Way/Westport View Dr (signalized)
2) Ocean View Hills Pkwy/Sea Drift Way (unsignalized)
3) Ocean View Hills Pkwy/Del Sol Blvd/Breakers Way (signalized)
4) Ocean View Hills Pkwy/Sea Fire Pt (signalized)
5) Ocean View Hills Pkwy/Hidden Trails Rd (signalized)
6) Ocean View Hills Pkwy/Otay Mesa Rd/Caliente Ave (signalized)
7) Caliente Ave/SR-905 WB Ramp (signalized)
8) Caliente Ave/SR-905 EB Ramp (signalized)
9) Caliente Ave/Airway Rd (un-signalized)
10) Otay Mesa Road / Project Driveway *(Does Not Exist)*
11) Otay Mesa Rd/Emerald Crest Ct (un-signalized)
12) Otay Mesa Rd/Corporate Center Rd (signalized)
13) Otay Mesa Rd/Innovative Dr (unsignalized)
14) Otay Mesa Rd/Heritage Rd (signalized)

The study area included the following street segments:

1) Caliente Ave from Otay Mesa Rd to SR-905 WB Ramp
2) Caliente Ave from SR-905 WB Ramp to SR-905 EB Ramp
3) Caliente Ave from SR-905 EB Ramp to Airway Rd
4) Ocean View Hills Pkwy from Starfish Way/Westport View Dr to Sea Drift Way
5) Ocean View Hills Pkwy from Sea Drift Way to Del Sol Blvd/Breakers Way
6) Ocean View Hills Pkwy from Del Sol Blvd/Breakers Way to Sea Fire Pt
7) Ocean View Hills Pkwy from Sea Fire Pt to Hidden Trails Rd
8) Ocean View Hills Pkwy from Hidden Trails Rd to Otay Mesa Rd/Caliente Ave
9) Otay Mesa Rd from Ocean View Hills Pkwy/Caliente Ave to Project Driveway
10) Otay Mesa Road from Project Driveway to Emerald Crest Ct
11) Otay Mesa Rd from Emerald Crest Ct to Corporate Center Dr
12) Otay Mesa Rd from Corporate Center Dr to Innovative Dr
13) Otay Mesa Rd from Innovative Dr to Heritage Rd

Figure 3: Study Area



The study area included the following freeway segments:

1) SR-905 from Interstate 805 to Caliente Ave
2) SR-905 from Caliente Ave to Britannia Boulevard

The State Route 905 eastbound and westbound on-ramps at Caliente Avenue were analyzed in the horizon year.

2.2 Scenarios

For this project, the following scenarios were analyzed:

1) Existing Conditions
2) Existing with Project Conditions
3) Near-Term Year 2020 without Project Conditions
4) Near-Term Year 2020 with Project (Opening Day) Conditions
5) Horizon Year 2062 without Project Conditions
6) Horizon Year 2062 with Project Conditions

2.3 Traffic Analysis

The traffic analyses prepared for this study were based on the *2000 and 2010 Highway Capacity Manual* (HCM) operations analysis using Level of Service (LOS) evaluation criteria. The operating conditions of the study intersections, street segments, and freeway segments were measured using the HCM LOS designations, which ranges from A through F. LOS A represents the best operating condition and LOS F denotes the worst operating condition. This traffic study was prepared using the City of San Diego criteria with a completed traffic study checklist included in **Appendix A**. Metered freeway on-ramps were evaluated using City of San Diego criteria of vehicle delay and queue length. The individual LOS criteria for each roadway component are described below.

2.3.1 Intersections

The study intersections were analyzed based on the **operational analysis** outlined in the 2010 HCM. This process defines LOS in terms of **average control delay** per vehicle, which is measured in seconds. LOS at the intersections were calculated using the computer software program Synchro 10 (Trafficware Corporation). The HCM LOS for the range of delay by seconds for un-signalized and signalized intersections is described in **Table 1**.

TABLE 1: INTERSECTION LEVEL OF SERVICE DEFINITIONS (HCM 2010)

Level of Service	Un-Signalized (TWSC and AWSC) Control Delay (seconds/vehicle)	Signalized Control Delay (seconds/vehicle)
A	0-10	$\leq$ 10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80

TWSC: Two Way Stop Control. AWSC: All Way Stop Control. Source: Highway Capacity Manual 2010 (exhibit 19-1 for two way stop control, exhibit 20-2 for all way stop control, and exhibit 18-4 for signalized intersections). For unsignalized intersections, the control delay is the worst movement delay in seconds/vehicle.

Please note that the HCM 2010 computation algorithm does not support turning movement with shared and exclusive lanes, therefore, the intersections of Caliente Avenue at Airway Road and Otay Mesa Road at Corporate Center Road were analyzed using HCM 2000 LOS. The 2000 HCM LOS for un-signalized and signalized intersections is described in **Table 2**.

TABLE 2: INTERSECTION LEVEL OF SERVICE (HCM 2000)

Level of Service	Un-Signalized Average Control Delay (seconds/vehicle)	Signalized Average Control Delay (seconds/vehicle)
A	0-10	0-10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80

Source: Highway Capacity Manual 2000. For unsignalized intersections, the control delay is the worst movement delay in seconds/vehicle.

2.3.2 Street Segments

The street segments were analyzed based on the functional classification of the roadway using the City of San Diego *Average Daily Vehicle Trips* capacity lookup table (**Appendix B**). The roadway segment capacity and LOS standards used to analyze street segments are summarized in **Table 3**.

TABLE 3: STREET SEGMENT DAILY CAPACITY AND LOS (CITY OF SAN DIEGO)

Circulation Element Road Classification	LOS A	LOS B	LOS C	LOS D	LOS E
Expressway – 6 Lanes	<30,000	<42,000	<60,000	<70,000	<80,000
Prime Arterial – 6 Lanes	<25,000	<35,000	<50,000	<55,000	<60,000
Major Arterial – 6 Lanes	<20,000	<28,000	<40,000	<45,000	<50,000
Major Arterial – 5 Lanes*	<17,500	<24,500	<35,000	<40,000	<45,000
Major Arterial – 4 Lanes	<15,000	<21,000	<30,000	<35,000	<40,000
Collector – 5 Lanes**	<12,500	<17,500	<25,000	<30,000	<35,000
Collector – 4 Lanes	<10,000	<14,000	<20,000	<25,000	<30,000
Collector (no Center Ln) – 4 Lanes Collector (with TWLTL) – 2 Lanes	<5,000	<7,000	<10,000	<13,000	<15,000
Collector – 2 Lanes (no fronting property)	<4,000	<5,500	<7,500	<9,000	<10,000
Collector – 2 Lanes (commercial-industrial fronting)	<2,500	<3,500	<5,000	<6,500	<8,000
Collector – 2 Lanes (multi-family)	<2,500	<3,500	<5,000	<6,500	<8,000
Sub-Collector – 2 Lanes (multi-family)			<2,200		

Source: City of San Diego *Traffic Impact Study Manual* July 1998, page 8. **5 lane Collector capacity calculated as average between 4 lane Major and 4 lane Collector to be consistent with proportionality applied to other 5 lane capacities.

2.3.3 Freeway Segments

The freeway segments were analyzed based on a multilane highway LOS criteria using a Volume to Capacity (V/C) ratio as outlined in the 2000 HCM. The accepted methodology by Caltrans for the analysis of freeway sections is to use the most current edition of the HCM as noted on page 5 of Caltrans' *Guide for the Preparation of Traffic Impact Studies,* December 2002, which also documents a maximum service flow rate of 2,350 passenger cars per hour per lane. The freeway LOS operations are based on the Caltrans' *2002 Guide for the Preparation of Traffic Impact Studies* (Dec 2002) V/C ratios as summarized below in **Table 4**. Excerpts from the Caltrans guide showing Freeway LOS and maximum service flow rate are included in **Appendix C**.

TABLE 4: FREEWAY LEVEL OF SERVICE

Measure of Effectiveness	LOS A	LOS B	LOS C	LOS D	LOS E
Volume/Capacity Ratio	0.30	0.50	0.71	0.89	1.00

Source: Caltrans' Guide for the Preparation of Traffic Impact Studies.

2.3.4 Metered Freeway On-Ramps

Caltrans was contacted to request on-ramp meter rates at Caliente Avenue/SR-905. Caltrans replied that they are currently not metered; therefore, an on-ramp analysis is not provided for existing and near-term conditions. For horizon year conditions, a ramp meter analysis was prepared using the horizon year rate used in the Otay Mesa Community Plan Update EIR. A significant impact occurs if the queue is greater than 15 minutes and the downstream vehicular LOS is E or F. Caltrans correspondence and CPU EIR ramp meter rate are included in **Appendix D**.

2.4 Significance Criteria

A project is considered to have caused a significant impact if the new project traffic has degraded an acceptable LOS to an unacceptable LOS (i.e. E or F) or has decreased the operations on the surrounding roadways by the City of San Diego defined thresholds as shown in **Table 5**.

TABLE 5: CITY OF SAN DIEGO TRAFFIC IMPACT SIGNIFICANCE THRESHOLDS

Level of Service with Project	Allowable Increase Due to Project Impacts[1]				
	Freeways	Roadway Segments		Intersections	Ramp Metering
	V/C	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
E[2]	0.01	0.02	1.0	2.0	2.0[3]
F[2]	0.005	0.01	0.5	1.0	1.0[3]

Source: City of San Diego. Notes: [1] If a proposed project's traffic impact exceeds the values shown in the table, then the impacts are deemed "significant." The project applicant shall identify "feasible mitigations" to achieve LOS D or better. [2] The acceptable Level of Service (LOS) standard for roadways and intersections in San Diego is LOS D. However, for undeveloped locations, the goal is to achieve a LOS C. [3] The impact is only considered significant if the total delay exceeds 15 minutes AND freeway is operating at LOS E/F. Delay measured in seconds. V/C = Volume to Capacity Ratio (capacity at LOS E should be used). Speed = Arterial speed measured in miles per hour for CMP analyses.

If a significant impact is calculated due to the addition of project traffic, then a feasible mitigation is required to return the facility to the pre-project condition or better, else the impact may be considered significant and unmitigated.

2.5 Congestion Management Program Criteria

The San Diego Association of Governments (SANDAG) has the following statement on their website regarding the Congestion Management Program (CMP):

> "In October 2009, the San Diego region elected to be exempt from the State CMP and, since this decision, SANDAG has been abiding by 23 CFR 450.320 to ensure the region's continued compliance with the federal congestion management process."

3.0 Existing Conditions

This section describes the study area street system, peak hour intersection volumes, daily roadway volumes, and existing LOS.

3.1 Existing Street System

In the vicinity of the project, the following roadways and State Route were analyzed as part of this study.

Caliente Avenue from Otay Mesa Road to Airway Road is classified as a *6-Lane Prime* in the City of San Diego *Otay Mesa Community Plan Update*, March 2014 (excerpts included in **Appendix E**). Caliente Avenue from Otay Mesa Road to SR-905 WB Ramp is currently constructed as a five (5) lane undivided roadway (three southbound and two northbound lanes), with Class II bike lanes in each direction, and on-street parking prohibited on both side of the roadway. There is a transition in the directionality of the five (5) lanes on the bridge over SR-905 between the WB Ramp and EB Ramp. Caliente Avenue on the bridge has three (3) southbound lanes to which one lane becomes a trap lane for southbound left turns onto eastbound SR-905. This results in two (2) southbound lanes across the SR-905 EB Ramp intersection. In the northbound direction, the three (3) lanes on the bridge approach the SR-905 WB Ramp intersection with a designated left-turn lane and three through lanes. The northbound vehicles are received by four (4) lanes with a designated left turn lane, two through lanes, and a designated right turn lane at the intersection of Otay Mesa Road/Ocean View Hills/Caliente Avenue. Thus, there are two (2) northbound lanes between SR-905 WB Ramp and Otay Mesa Road. From SR-905 WB Ramp to Airway Road, Caliente Avenue is constructed as a five (5) lane undivided roadway with three (3) northbound lanes and two (2) southbound lanes, bike lanes in each direction, and on-street parking prohibited on both sides of the roadway. A posted speed limit was not observed on these segments. Contiguous sidewalks are present on both sides of the street.

Ocean View Hills Parkway from Starfish Way/Westport View Drive to Del Sol Boulevard/Breakers Way is classified as a *4-Lane Major* in the City of San Diego *Otay Mesa Community Plan Update*, March 2014, constructed as a four (4) lane divided roadway, posted at 45 Miles per Hour (MPH) with Class II bike lanes on each side of the roadway, and on-street parking prohibited on both side of the roadway. From Del Sol Boulevard/Breakers Way to Otay Mesa Road, Ocean View Hills Parkway is classified as a *6-Lane Major* in the City of San Diego *Otay Mesa Community Plan Update*, constructed as a six (6) lane divided roadway, posted at 45 MPH in the southbound direction and 40 MPH in the northbound direction with bike lanes on each side of the roadway, and on-street parking prohibited on both sides of the roadway. Non-contiguous sidewalk is present on both sides of the street.

Otay Mesa Road from Caliente Avenue to Heritage Road is classified as a *6-Lane Prime* in the City of San Diego *Otay Mesa Community Plan Update*, March 2014. This segment of roadway is constructed as a six (6) lane divided roadway with three lanes in each direction. The posted speed limit is 50 MPH. The south side of Otay Mesa Road has a break-down/shoulder lane. The north side of Otay Mesa Road was observed to have vehicles parking in the shoulder lane. Class III bike route signs were observed on Otay Mesa Road in the project vicinity. West of Caliente Avenue, Otay Mesa Road extends westerly for approximately 1,300 feet and then terminates in a cul-de-sac. Non-contiguous sidewalk is present on the north side of Otay Mesa Road from Oceanview Hills Parkway to approximately 650 feet east of Emerald Crest Court with contiguous sidewalk from Corporate Center Drive to Innovative Drive and non-contiguous sidewalk from Innovative Drive easterly for approximately 750 feet. There are no sidewalks between the sections described above on the north side and no sidewalks on the southside of Otay Mesa Road between Oceanview Hills Parkway and Heritage Road.

State Route 905 (SR-905) from Interstate 805 to Britannia Boulevard is classified as a *Freeway* in the City of San Diego *Otay Mesa Community Plan Update*, March 2014. SR-905 from I-805 to Caliente Avenue is currently built as an eight (8) lane divided freeway (4 lanes each direction). From Caliente Avenue to Britannia Boulevard, SR-905 is constructed as a six (6) lane divided freeway (3 lanes each direction). A posted speed limit of 65 MPH was observed on the westbound side of the freeway.

3.2 Multi-Modal Transportation

This section describes the existing multi-modal transportation elements near the project site.

3.2.1 Transit

Metropolitan Transit System (MTS) provides bus service as Route 905a and 905b along the project frontage on Otay Mesa Road and Caliente Avenue. The Route 905 bus stop on the EB off-ramp at SR-905/Caliente Ave is located approximately 2,200 feet from the center of the residential project using a path of sidewalks and crosswalks. The Route 905 bus stop on the WB off-ramp at SR-905/Caliente Ave is located approximately 1,700 feet from the center of the residential project using a path of sidewalks and crosswalks. The Route 905 bus stop on the north side of Otay Mesa Road east of Corporate Center Drive is located approximately 2,500 feet from the center of the residential project using a path of sidewalks and crosswalks.

Route 905a has Monday through Friday service starting around 5:00 AM and ending around 9:00 PM while 905b has Monday through Friday service starting around 8:00 AM and ending around 6:00 PM. Route 905b starts with approximately 20-minute headways and then alternates 20-minute headways with Route 905b during the schedule of Route 905b. Weekend service is provided for Route 905 starting around 5:00 AM with approximately 20-minute headways until approximately 3:00 PM and then 1-hour headways until approximately 7:00 PM. Route 950 is an express service that follows SR-905 and does not exit at Caliente Avenue. Route 950 has Monday through Friday service from around 4:30 AM to approximately 9:30 PM. A route map and specific service times with frequency are outlined in the bus schedule that is included in **Appendix F**. The applicant has coordinated with MTS and determined that MTS desires a future bus stop on the southeast corner of Otay Mesa Road at Street B/Emerald Crest Court. Since this future bus stop location is not along the project frontage, the applicant would not provide bus stop improvements on another parcel.

3.2.2 Bicycle

Existing Bicycle Lanes and Routes

Class II bike lanes were observed on Caliente Avenue and along Ocean View Hills Parkway in the project vicinity. Class III bike route signs were observed on Otay Mesa Road in the project vicinity (according to City staff, this bike route along Otay Mesa Road is proposed to be upgraded to Class II).

Proposed Bicycle Lanes and Routes

The City of San Diego *Bicycle Master Plan*, December 2013 shows a Class III bike route along Otay Mesa Road and Class II bike lanes along Ocean View Hills Parkway. The *Otay Mesa Community Plan Update* shows Class II bike lanes on Otay Mesa Road and Class II bike lanes along Ocean View Hills Parkway and on Caliente Avenue. The *Otay Mesa Community Plan Update* also shows near-by proposed bike lanes such as a Class I bicycle route planned along the south side of Airway Road. Excerpts from the City of San Diego *Bicycle Master Plan Update* and the *Otay Mesa Community Plan Update* are included in **Appendix G**.

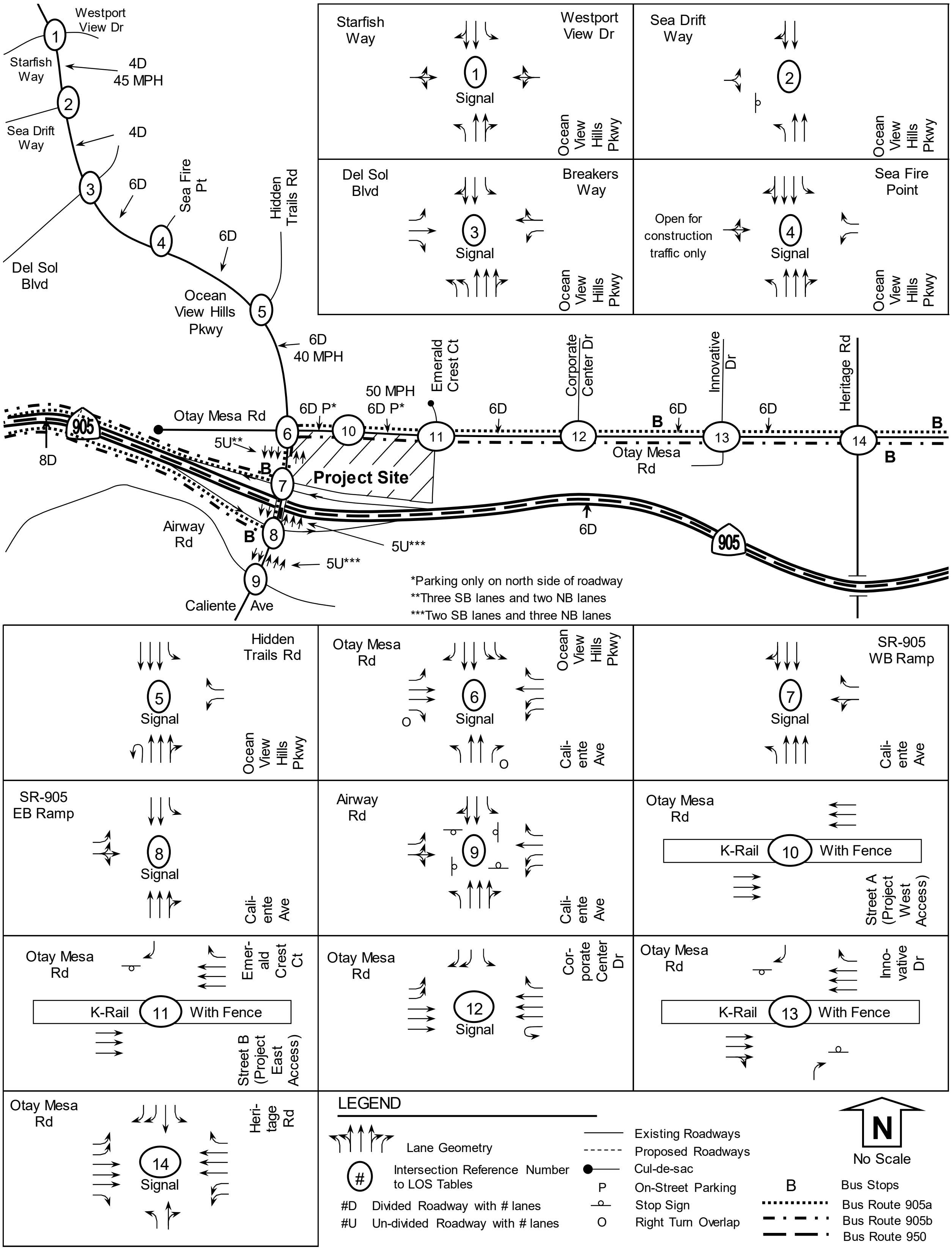
3.2.3 Pedestrian

There are currently 6-foot contiguous sidewalks along both side of Caliente Avenue adjacent to the project site. There are no sidewalks along the south side of Otay Mesa Road along the project frontage. The project will construct a 6-ft non-contiguous sidewalk along the project frontage on Otay Mesa Road and a 6-ft non-contiguous sidewalk along Caliente Avenue, especially since the project will contain residential units and students will likely walk to school along the internal drives and perimeter streets.

3.2.4 Existing Conditions Map

The existing roadway conditions along with the bus route and bus stops are shown in **Figure 4**. Copies of the City of San Diego community plan roadway classification and land use excerpts are included in Appendix E.

Figure 4: Existing Conditions



3.3 Existing Traffic Volumes and LOS Analyses

Existing counts were collected between 7:00 AM and 9:00 AM for the AM commuter period and from 4:00 PM to 6:00 PM for the PM commuter period on Wednesday, January 18, 2018 (unless noted below). Street segment counts were also taken on that day. The intersections included:

1) Ocean View Hills Pkwy/Starfish Way-Westport View Drive
2) Ocean View Hills Pkwy/Sea Drift Way
3) Ocean View Hills Pkwy/Del Sol Blvd-Breakers Way
4) Ocean View Hills Pkwy/Sea Fire Point
5) Ocean View Hills Pkwy/Hidden Trails Rd
6) Ocean View Hills Pkwy/Otay Mesa Rd
7) Caliente Ave/SR-905 WB Ramp
8) Caliente Ave/SR-905 EB Ramp
9) Caliente Ave/Airway Road
10) *Otay Mesa Road/Project Driveway (DNE – not analyzed under Existing Conditions)*
11) Otay Mesa Road/Emerald Crest Ct
12) Otay Mesa Road/Corporate Center Dr
13) Otay Mesa Road/Innovative Dr (Tuesday, September 11, 2018)
14) Otay Mesa Road/Heritage Rd

Existing street segments daily volumes were collected on Wednesday, January 18, 2018 (unless noted below) for the following locations:

1) Ocean View Hills Pkwy between Starfish Way and Sea Drift Way
2) Ocean View Hills Pkwy between Sea Drift Way and Del Sol Blvd
3) Ocean View Hills Pkwy between Del Sol Blvd and Sea Fire Pt
4) Ocean View Hills Pkwy between Sea Fire Pt and Hidden Trails Rd
5) Ocean View Hills Pkwy between Hidden Trails Rd and Otay Mesa Rd
6) Caliente Ave between Otay Mead Rd and SR-905 WB Ramp
7) Caliente Ave between SR-905 WB Ramp and SR-905 EB Ramp
8) Caliente Ave between SR-905 EB Ramp and Airway Rd
9) Otay Mesa Road between Ocean View Hills Pkwy and Emerald Crest (please note there is no median break at Emerald Crest Ct)
10) Otay Mesa Road between Emerald Crest Ct and Corporate Center Dr (please note there is no median break at Emerald Crest Ct)
11) Otay Mesa Road between Corporate Center Dr and Innovative Dr
12) Otay Mesa Road between Innovative Dr and Heritage Rd (Tuesday, Sept 11, 2018)

Counts for the following freeway segments were obtained from Caltrans (2016 data):

1) SR-905 from I-8 to Caliente Avenue
2) SR-905 from Caliente Avenue to Heritage Road

The State Route 905 eastbound and westbound on-ramps at Caliente Avenue are currently not metered.

The existing AM, PM, and ADT volumes are shown on **Figure 5**, with count data included in **Appendix H**. LOS for existing conditions are shown in **Tables 6 through 8**. Existing peak hour intersection LOS calculations are included in **Appendix I**.

Figure 5: Existing Volumes

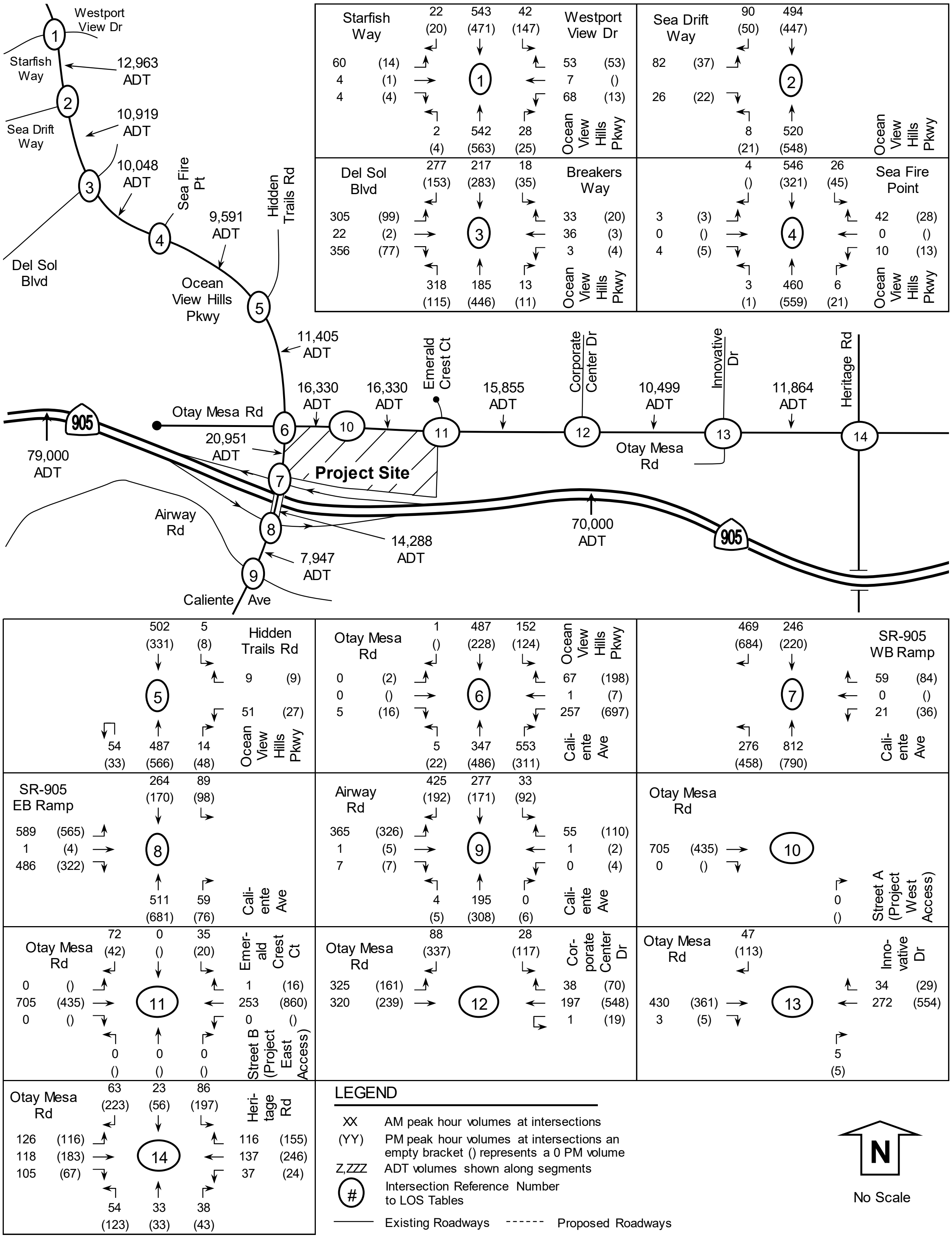


TABLE 6: EXISTING INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis)[1]	Movement	Study Period	Existing Delay[2]	Existing LOS[3]
1) Ocean View Hills Pkwy	All	AM	15.9	B
at Starfish/Westport (S)	All	PM	16.1	B
2) Ocean View Hills Pkwy	EB LR	AM	16.6	C
at Sea Drift Wy (U)	NB L	AM	8.9	A
	EB LR	PM	14.4	B
	NB L	PM	8.8	A
3) Ocean View Hills Pkwy	All	AM	34.6	C
at Del Sol/Breakers (S)	All	PM	17.5	C
4) Ocean View Hills Pkwy	All	AM	9.0	A
at Sea Fire Pt (S)	All	PM	9.8	A
5) Ocean View Hills Pkwy	All	AM	4.6	A
at Hidden Trails Rd (S)	All	PM	4.5	A
6) Ocean View Hills Pkwy	All	AM	21.9	C
at Caliente/Otay Mesa (S)	All	PM	27.4	C
7) Caliente Ave at	All	AM	15.4	B
SR-905 WB Ramp (S)	All	PM	53.6	D
8) Caliente Ave at	All	AM	33.7	C
SR-905 EB Ramp (S)	All	PM	31.4	C
9) Caliente Ave at	All	AM	**124.8**	**F**
Airway Rd (U)	All	PM	27.4	D
10) Otay Mesa Rd at	NB R	AM	DNE	NA
Project West Access (U)	NB R	PM	DNE	NA
11) Otay Mesa Rd at	SB R	AM	10.4	B
Emerald Crest Ct (U)	SB R	PM	13.7	B
12) Otay Mesa Rd at	All	AM	24.5	C
Corporate Center Rd (S)	All	PM	21.6	C
13) Otay Mesa Rd at	NB R	AM	10.6	B
Innovative Dr (U)	SB R	AM	10.2	B
	NB R	PM	10.3	B
	SB R	PM	12.7	B
14) Otay Mesa Rd at	All	AM	29.6	C
Heritage Rd (S)	All	PM	33.3	C

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. DNE: Does Not Exist. NA: Not Applicable. Bold indicated unacceptable LOS. Note: Intersections 11 and 13 are right-in, right-out only.

TABLE 7: EXISTING SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Segment	Classification: Ultimate and (Functional)	LOS E Capacity	Existing Daily Volume	Existing V/C	Existing LOS
Caliente Avenue					
Otay Mesa Rd to SR-905 WB Ramp	6P (5C)	35,000	20,951	0.599	C
SR-905 EB Ramp to SR-905 EB Ramp	6P (5C)	35,000	14,288	0.408	B
SR-905 EB Ramp to Airway Rd	6P (5C)	35,000	7,947	0.227	A
Ocean View Hills Parkway					
Starfish Way/Westport View to Sea Drift Way	4M (4M)	40,000	12,963	0.324	A
Sea Drift Way to Del Sol Blvd	4M (4M)	40,000	10,919	0.273	A
Del Sol Blvd to Sea Fire Pt	6M (6M)	50,000	10,048	0.201	A
Sea Fire Pt to Hidden Trails Rd	6M (6M)	50,000	9,591	0.192	A
Hidden Trails Rd to Otay Mesa Rd	6M (6M)	50,000	11,405	0.228	A
Otay Mesa Road					
Ocean View Hills Pkwy to Proj. W. Access	6P (6P)	60,000	16,330	0.272	A
Proj. W. Access to Emerald Crest Ct	6P (6P)	60,000	16,330	0.272	A
Emerald Crest Ct to Corporate Center Dr	6P (6P)	60,000	15,855	0.264	A
Corporate Center Dr to Innovative Dr	6P (6P)	60,000	10,499	0.175	A
Innovative Dr to Heritage Rd	6P (6P)	60,000	11,864	0.198	A

Notes: 6P=6 lane Prime, 6M = 6 lane Major, 5C=5 lane Collector, 4M=4 lane Major. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

TABLE 8: EXISTING STATE ROUTE VOLUMES AND LEVEL OF SERVICE

State Route	SR-905				SR-905			
Segment	I-805 to Caliente Ave				Caliente Ave to Britannia Blvd			
Existing Year 2016 ADT	79,000				70,000			
Peak Hour	A M		P M		A M		P M	
Direction	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	4	4	4	4	3	3	3	3
Capacity (1)	9,400	9,400	9,400	9,400	7,050	7,050	7,050	7,050
K Factor (2)	0.0761	0.0761	0.0902	0.0902	0.0761	0.0761	0.0902	0.0902
D Factor (3)	0.6624	0.3376	0.4124	0.5876	0.6624	0.3376	0.4124	0.5876
Truck Factor (4)	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811
Peak Hour Volume	4,520	2,304	3,335	4,752	4,005	2,041	2,955	4,211
Volume to Capacity	0.481	0.245	0.355	0.506	0.568	0.290	0.419	0.597
Existing LOS	B	A	B	C	C	A	B	C

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) K factor from Caltrans, which is the percentage of AADT in both directions. (3) D factor from Caltrans, which when multiplied by K and ADT will provide peak hour volume. (4) Truck factor from Caltrans. Excel rounding may result in ±1 above.

Under existing conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersection of Caliente Avenue at Airway Road (LOS F AM). The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

HCM 2010 software does not permit more than three approach lanes for analysis under all-way stop conditions; therefore, the analysis had a reduction in the number of approach lanes. The software decreases the northbound and westbound movement approach lanes from 4 approach lanes to 3 approach lanes each, although the southbound movements were failing.

4.0 Project Description

The proposed California Terraces PA 61 is a mixed-use project with 171 to 267 multi-family units, up to 45,000 sf of commercial/retail space, and a 0.19 acre private park. The site of approximately 14 acres is currently vacant. The project is anticipated to open in 2020. The City of San Diego *Otay Mesa Community Plan* identifies the site as Community Commercial (Appendix E). The project requires a CPA to redesignate the site from Community Commercial – Residential Prohibited to Community Commercial – Residential Permitted and to rezone the eastern portion of the property from CC-1-3 to RM-2-5. The following discretionary approvals are required as part of the project:

1) Vesting Tentative Map
2) Site Development Permit
3) Master Planned Development Permit
4) Neighborhood Development Permit
5) Community Plan Amendment Land Use and Roadway Classification
6) Street Vacation and Rezone

4.1 Project Site Access

Two new public cul-de-sac streets are proposed as part of the project (Street A and Street B). Project access will be from driveways on these cul-de-sac streets. A right-in/right-out only point of access is proposed on Otay Mesa Road approximately 500 feet east of Caliente Avenue (centerline to centerline, Street A) and a full signalized shared access at Otay Mesa Road/Emerald Crest Court/ Street B. The intersection of Otay Mesa Road /Emerald Crest Court will be signalized by the first applicant to obtain building permits between this project and the adjacent Handler commercial project, unless it is completed beforehand as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007. Additionally, Pardee and Handler have letters of permission for offsite grading/improvements from each other (included in **Appendix J**) to allow the first in line to proceed with the full construction of Street B (southerly extension of Emerald Crest Ct); however, Pardee agrees to the conditions of approval that requires the construction of Street B if Pardee precedes the adjacent Handler commercial project. Each of the two access points will have a dedicated right turn deceleration lane along Otay Mesa Road.

Street B will also serve the adjacent and easterly parcel currently being processed as the Handler Commercial improvement plans. Coordination is on-going with the Handler Commercial applicant. The California MUTCD Figure 4C-103 (Average Traffic Estimate Form) signal warrant analysis is satisfied with the addition of project traffic for a traffic signal at the intersection of Otay Mesa Road/Street B/Emerald Crest Court. The traffic signal warrant is also included in Appendix J.

4.2 Project Trip Generation

The trip generation for the project was calculated using trip rates from the City of San Diego *Trip Generation Manual*, May 2003 (excerpt included in **Appendix K**). Two trip generation rates were applied: a driveway rate for project access points and intersection of Otay Mesa Road/ Caliente Avenue/Ocean View Hills Parkway and a cumulative rate that was applied for all other analyzed roadways.

A Series 13, year 2050 SANDAG Select Zone Assignment for the project land uses documented an internal capture rate of 2.8% that was applied to the trip generation. The SANDAG internal capture rate is included in **Appendix L**. The residential density is greater than 20 units per acres (267 du/9.2 acres = 29.0 du/acre).

The project driveway volumes were calculated at 6,816 ADT with 336 AM peak hour trips (152 inbound and 184 outbound) and 717 PM peak hour trips (387 inbound and 330 outbound). The cumulative traffic volumes were calculated at 4,716 ADT with 252 AM peak hour trips (101 inbound and 151 outbound) and 486 PM peak hour trips (271 inbound and 215 outbound) as shown in **Table 9**.

TABLE 9: PROJECT TRIP GENERATION AS ANALYZED IN THIS TIA (HIGHEST DENSITY RESIDENTIAL WITH 267 UNITS)

Land Use	Daily Rate		Size & Units		ADT	AM %	AM Split		AM IN	AM OUT	PM %	PM Split		PM IN	PM OUT
Driveway Trips															
Neighborhood Shopping Center	120	/KSF	45,000	SF	**5,400**	4%	0.6	0.4	**130**	**86**	11%	0.5	0.5	**297**	**297**
Multi Family (over 20 du/ac)	6	/DU	267	DU	**1,602**	8%	0.2	0.8	**26**	**103**	9%	0.7	0.3	**101**	**43**
Developed Park	50	/Acre	0.19	Acres	**10**	4%	0.5	0.5	**0**	**0**	8%	0.5	0.5	**0**	**0**
SANDAG Traffic Model Internal Capture 2.8%					**-196**				**-4**	**-5**				**-11**	**-10**
External Driveway Trips:					**6,816**				**152**	**184**				**387**	**330**
Cumulative Trips															
Neighborhood Shopping Center	72	/KSF	45,000	SF	**3,240**	4%	0.6	0.4	**78**	**52**	11%	0.5	0.5	**178**	**178**
Multi Family (over 20 du/ac)	6	/DU	267	DU	**1,602**	8%	0.2	0.8	**26**	**103**	9%	0.7	0.3	**101**	**43**
Developed Park	50	/Acre	0.19	Acres	**10**	4%	0.5	0.5	**0**	**0**	8%	0.5	0.5	**0**	**0**
SANDAG Traffic Model Internal Capture 2.8%					**-136**				**-3**	**-4**				**-8**	**-6**
External Cumulative Trips:					**4,716**				**101**	**151**				**271**	**215**

Source: City of San Diego *Trip Generation Manual*, May 2003. SF - Square Feet; ADT-Average Daily Traffic. Totals above ±1 due to Excel rounding.

SF - Square Feet; ADT-Average Daily Traffic; Split-percent inbound and outbound.

If the final project has fewer units, the trip generation will decrease until reaching 183 units at which time the density decreases to less than 20 du/acre (183 du/9.2ac = 19.9 du/acre). At 183 units, the applicable trip generation rate of 8 ADT/du results in 1,464 ADT with 117 AM peak hour trips (23 inbound and 94 outbound) and 146 PM peak hour trips (102 inbound and 44 outbound). When compared to the 183 units at the higher trip rate, 267 units at 6 ADT/du is calculated to generate 1,602 ADT (138 more ADT), 128 AM peak hour trips (11 more peak hour trips), and 144 PM peak hour trips.

If the project is completed at a lower density as shown on the site plan with only 171 dwelling units, then the project driveway volumes were calculated at 6,656 ADT with 320 AM peak hour trips (149 inbound and 171 outbound) and 718 PM peak hour trips (386 inbound and 332 outbound). The cumulative traffic volumes were calculated at 4,535 ADT with 235 AM peak hour trips (98 inbound and 137 outbound) and 484 PM peak hour trips (269 inbound and 215 outbound) as shown in **Table 10**.

TABLE 10: PROJECT TRIP GENERATION NOT ANALYZED (LOWEST DENSITY RESIDENTIAL WITH 171 UNITS)

Land Use	Rate		Size & Units		ADT	AM %	AM Split		AM IN	AM OUT	PM %	PM Split		PM IN	PM OUT
Driveway Trips															
Neighborhood Shopping Center	120	/KSF	45,000	SF	**5,400**	4%	0.6	0.4	**130**	**86**	11%	0.5	0.5	**297**	**297**
Residential - Multi Family	8	/DU	171	DU	**1,368**	8%	0.2	0.8	**22**	**88**	10%	0.7	0.3	**96**	**41**
Developed Park	50	/Acre	0.19	Acres	**10**	4%	0.5	0.5	**0**	**0**	8%	0.5	0.5	**0**	**0**
SANDAG Internal Capture 1.8%					**-122**				**-3**	**-3**				**-7**	**-6**
External Driveway Trips:					**6,656**				**149**	**171**				**386**	**332**
Cumulative Trips															
Neighborhood Shopping Center	72	/KSF	45,000	SF	**3,240**	4%	0.6	0.4	**78**	**52**	11%	0.5	0.5	**178**	**178**
Residential - Multi Family	8	/DU	171	DU	**1,368**	8%	0.2	0.8	**22**	**88**	10%	0.7	0.3	**96**	**41**
Developed Park	50	/Acre	0.19	Acres	**10**	4%	0.5	0.5	**0**	**0**	8%	0.5	0.5	**0**	**0**
SANDAG Internal Capture 1.8%					**-83**				**-2**	**-3**				**-5**	**-4**
External Cumulative Trips:					**4,535**				**98**	**137**				**269**	**215**

Source: City of San Diego *Trip Generation Manual*, May 2003. SF - Square Feet; ADT-Average Daily Traffic. Totals above ±1 due to Excel rounding.

SF - Square Feet; ADT-Average Daily Traffic rounded to nearest 10 for total; Split-percent inbound and outbound.

4.3 Project Distribution and Assignment

Project traffic was distributed to the adjacent roadway network based on coordination with City staff, a review of existing traffic patterns, surrounding land uses, existing and future network changes, and a Series 13 Year 2050 SANDAG Select Zone Assignment (Appendix L). The project distribution is shown in **Figure 6**. The project assignment is shown in **Figure 7** to which driveway trips are applied to intersections #6, #10 and #11 to comply with the City of San Diego *Traffic Impact Study Manual*, July 1998 that states on page 13 "All site access points should be evaluated using the higher driveway rates."

Figure 6: Project Distribution

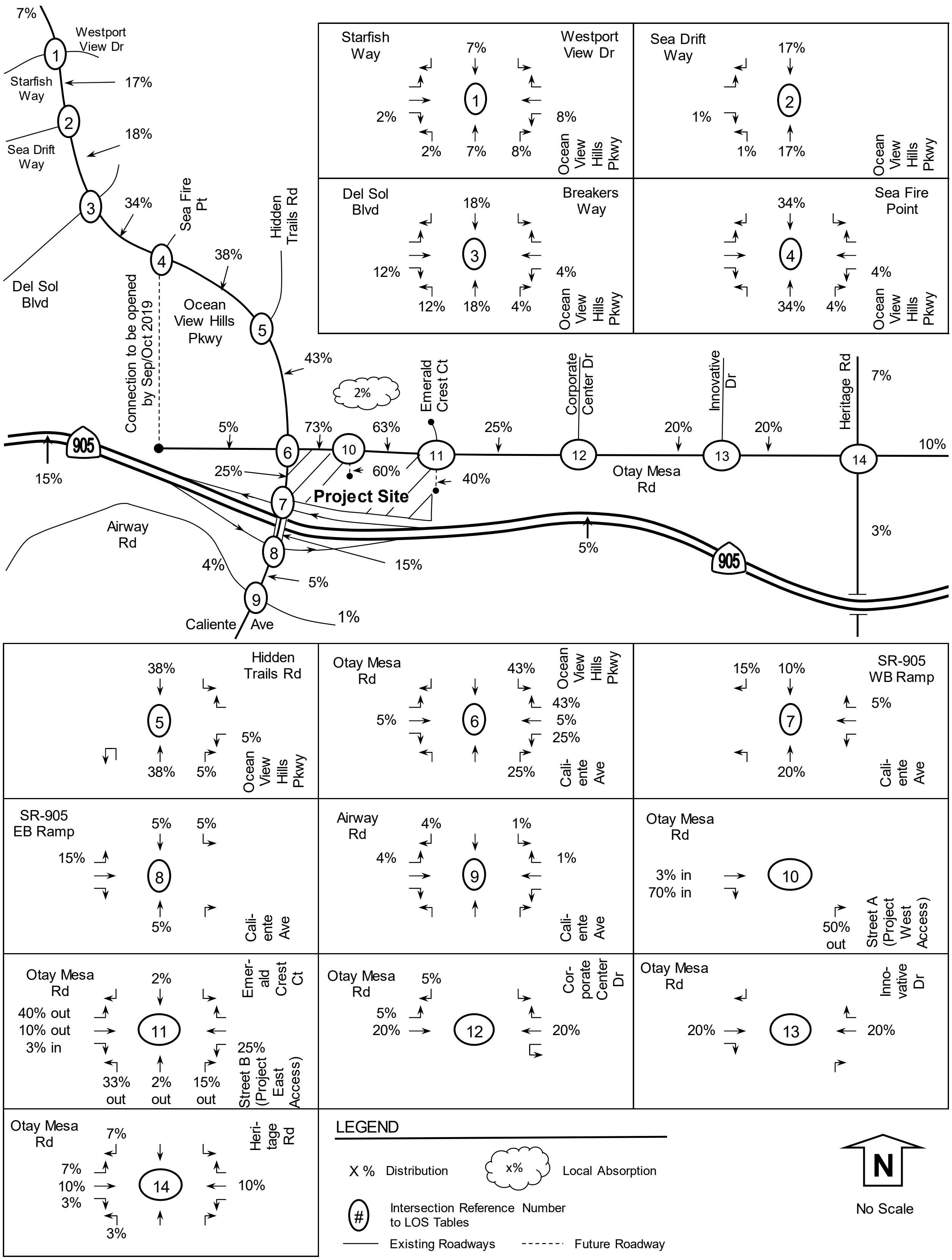
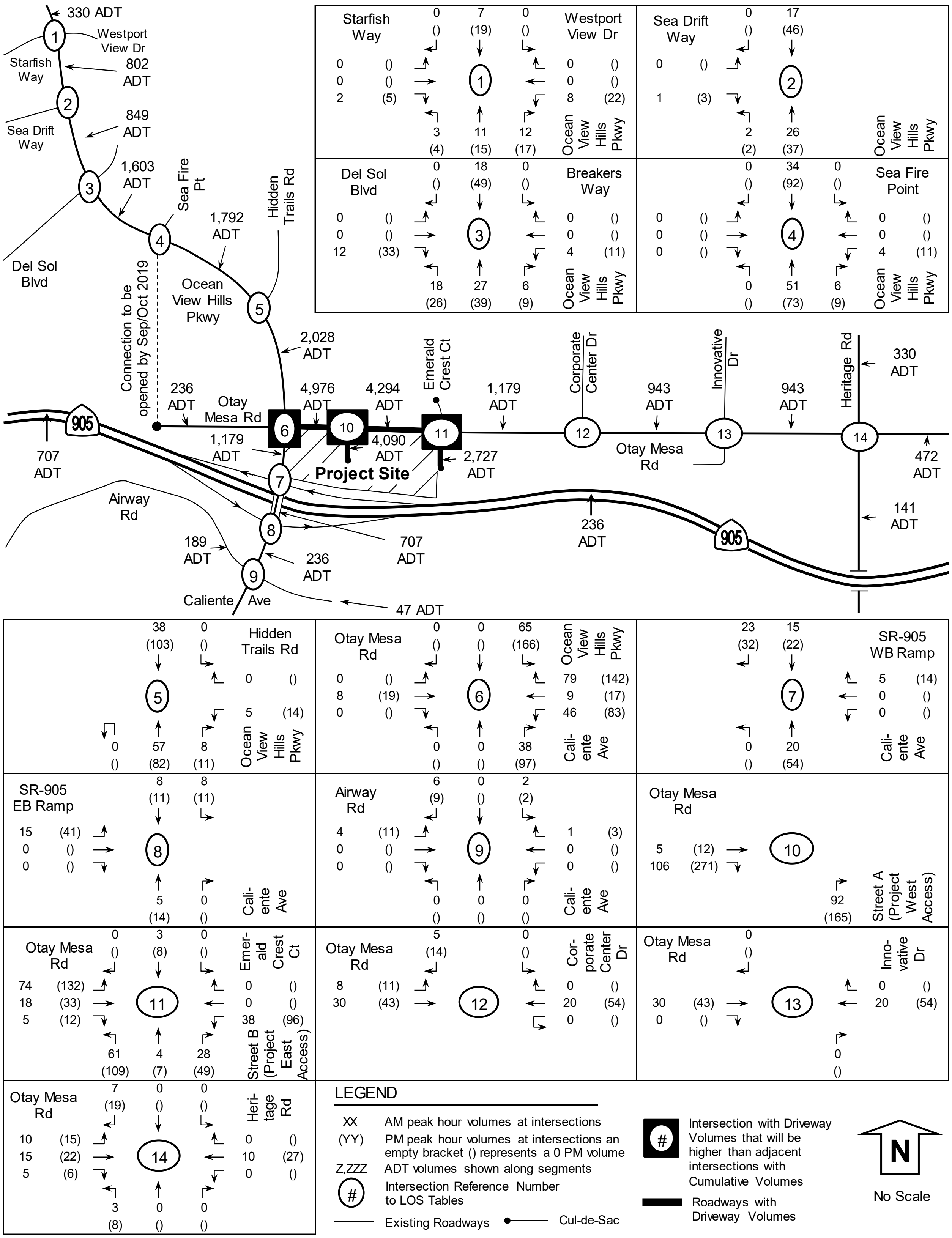


Figure 7: Project Assignment



5.0 Existing with Project Conditions

This scenario documents the addition of project traffic onto existing traffic for AM peak hour, PM peak hour, and daily conditions with volumes shown in **Figure 8**. Also shown on Figure 8 are the new south leg volumes at intersections 10 and 11. The opening year of the project is anticipated to be year 2020 in which the roadway connection on Ocean View Hills Parkway and Otay Mesa Road (shown in Figures 6 and 7) is scheduled to be opened by September or October of 2019. The existing with project roadway conditions are shown in **Figure 9**. The following analyses incorporated the aforementioned improvements by others along with project access improvements as part of the project. LOS operations for existing with project conditions are shown in **Tables 11 through 13**. LOS calculations are included in **Appendix M**.

TABLE 11: EXISTING WITH PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and	Movement	Study	Existing		Existing + Project			
(Analysis)[1]		Period	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	Impact?[5]
1) Ocean View Hills Pkwy	All	AM	15.9	B	16.4	B	0.5	No
at Starfish/Westport (S)	All	PM	16.1	B	17.4	B	1.3	No
2) Ocean View Hills Pkwy	EB LR	AM	16.6	C	17.0	C	0.4	No
at Sea Drift Wy (U)	NB L	AM	8.9	A	9.0	A	0.1	No
	EB LR	PM	14.4	B	15.1	C	0.7	No
	NB L	PM	8.8	A	9.0	A	0.2	No
3) Ocean View Hills Pkwy	All	AM	34.6	C	35.9	D	1.3	No
at Del Sol/Breakers (S)	All	PM	17.5	C	18.5	B	1.0	No
4) Ocean View Hills Pkwy	All	AM	9.0	A	9.0	A	0.0	No
at Sea Fire Pt (S)	All	PM	9.8	A	9.9	A	0.1	No
5) Ocean View Hills Pkwy	All	AM	4.6	A	4.7	A	0.1	No
at Hidden Trails Rd (S)	All	PM	4.5	A	4.8	A	0.3	No
6) Ocean View Hills Pkwy	All	AM	21.9	C	28.8	C	6.9	No
at Caliente/Otay Mesa (S)	All	PM	27.4	C	35.8	D	8.4	No
7) Caliente Ave at	All	AM	15.4	B	17.7	B	2.3	No
SR-905 WB Ramp (S)	All	PM	53.6	D	**61.4**	**E**	**7.8**	**Yes**
8) Caliente Ave at	All	AM	33.7	C	35.5	D	1.8	No
SR-905 EB Ramp (S)	All	PM	31.4	C	34.3	C	2.9	No
9) Caliente Ave at	All	AM	**124.8**	**F**	**129.4**	**F**	**4.6**	**Yes**
Airway Rd (U)	All	PM	27.4	D	29.7	D	2.3	No
10) Otay Mesa Rd at	NB R	AM	DNE	NA	13.5	B	NA	No
Project West Access (U)	NB R	PM	DNE	NA	12.7	B	NA	No
11) Otay Mesa Rd at	SB R	AM	10.4	B	16.7	C	6.3	No
Emerald Court/Street B	SB R	PM	13.7	B	**116.9**	**F**	**103.2**	**Yes**
Project Access (U)	NB R	AM	NA	NA	33.5	D	33.5	No
	NB R	PM	NA	NA	**317.4**	**F**	**317.4**	**Yes**
12) Otay Mesa Rd at	All	AM	24.5	C	24.5	C	0.0	No
Corporate Center Rd (S)	All	PM	21.6	C	22.0	C	0.4	No
13) Otay Mesa Rd at	NB R	AM	10.6	B	10.7	B	0.1	No
Innovative Dr (U)	SB R	AM	10.2	B	10.3	B	0.1	No
	NB R	PM	10.3	B	10.5	B	0.2	No
	SB R	PM	12.7	B	13.1	B	0.4	No
14) Otay Mesa Rd at	All	AM	29.6	C	29.6	C	0.0	No
Heritage Rd (S)	All	PM	33.3	C	33.7	C	0.4	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Impact if project traffic exceeds threshold. DNE: Does not exist. NA: Not Applicable. Bold indicates unacceptable LOS and/or project impact. Note: Intersections 11 and 13 are right-in, right-out only.

Figure 8: Existing with Project Volumes

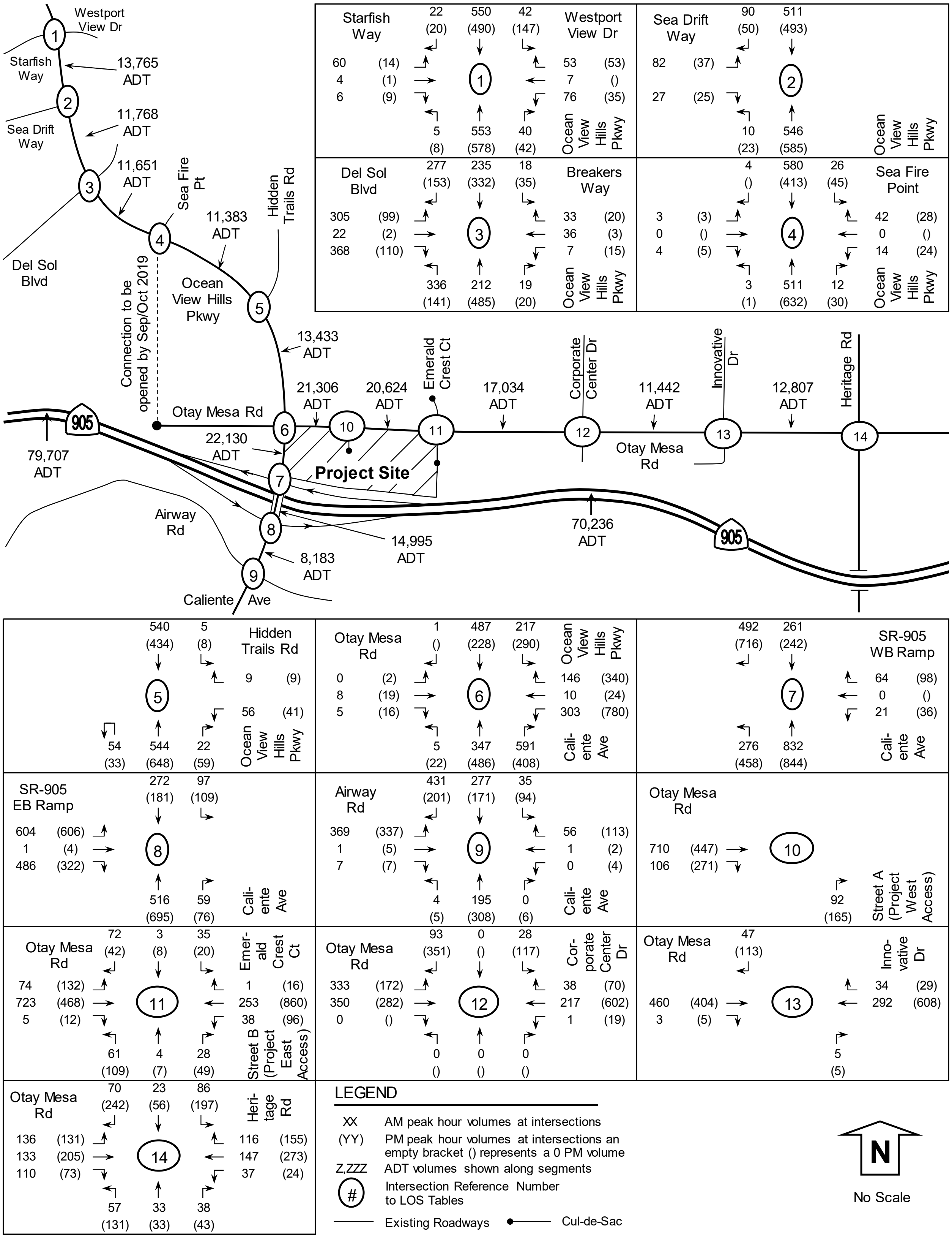


Figure 9: Existing with Project Conditions

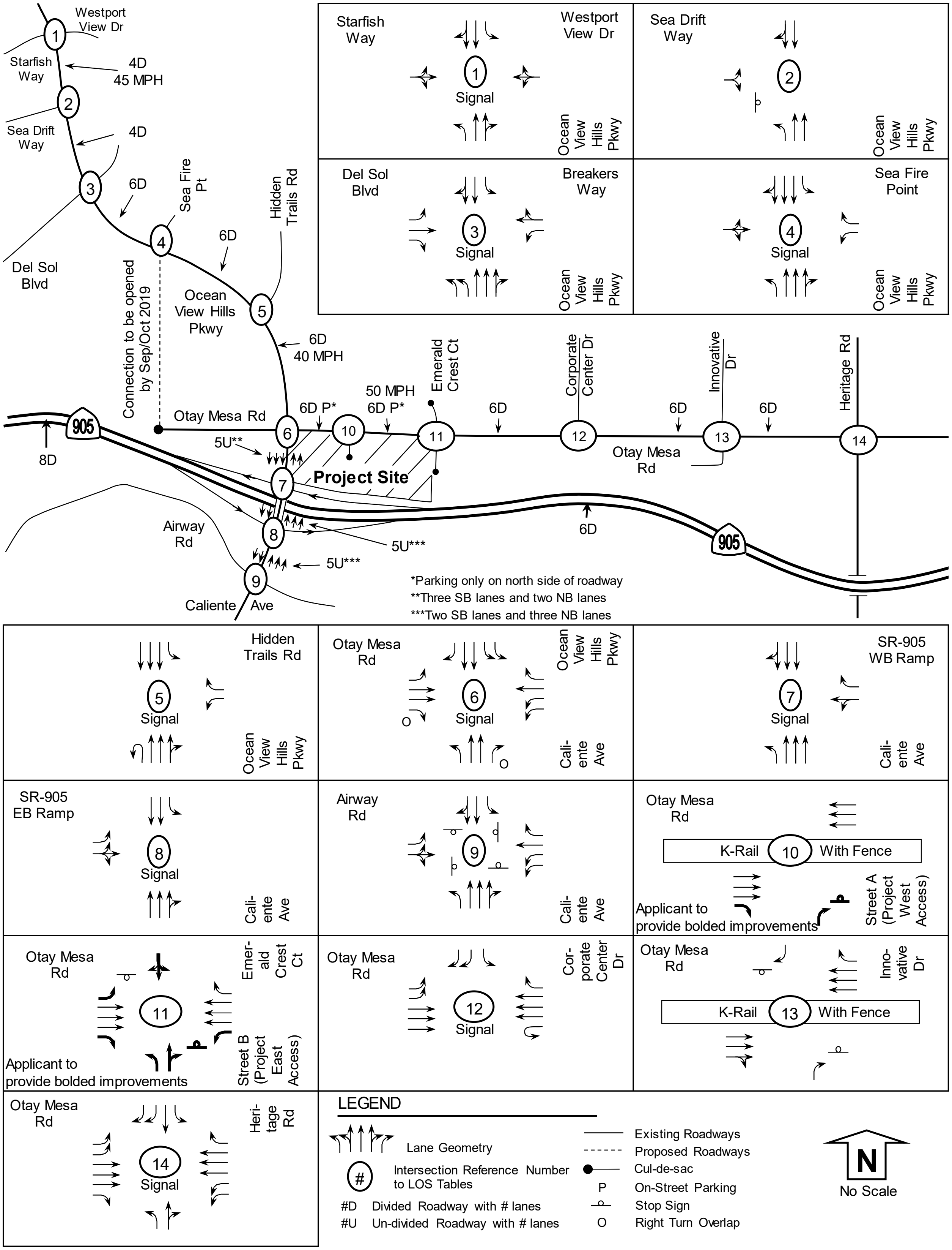


TABLE 12: EXISTING WITH PROJECT SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Segment	Classification: Ultimate and (Functional)	LOS E Capacity	Existing Daily Volume	Existing V/C	Existing LOS	Project Daily Volume	Existing + Project Daily Volume	Existing + Project V/C	Existing + Project LOS	Change in V/C	Project Impact?
Caliente Avenue											
Otay Mesa Rd to SR-905 WB Ramp	6P (5C)	35,000	20,951	0.599	C	1,179	22,130	0.632	C	0.034	No
SR-905 EB Ramp to SR-905 EB Ramp	6P (5C)	35,000	14,288	0.408	B	707	14,995	0.428	B	0.020	No
SR-905 EB Ramp to Airway Rd	6P (5C)	35,000	7,947	0.227	A	236	8,183	0.234	A	0.007	No
Ocean View Hills Parkway											
Starfish Way/Westport View to Sea Drift Way	4M (4M)	40,000	12,963	0.324	A	802	13,765	0.344	A	0.020	No
Sea Drift Way to Del Sol Blvd	4M (4M)	40,000	10,919	0.273	A	849	11,768	0.294	A	0.021	No
Del Sol Blvd to Sea Fire Pt	6M (6M)	50,000	10,048	0.201	A	1,603	11,651	0.233	A	0.032	No
Sea Fire Pt to Hidden Trails Rd	6M (6M)	50,000	9,591	0.192	A	1,792	11,383	0.228	A	0.036	No
Hidden Trails Rd to Otay Mesa Rd	6M (6M)	50,000	11,405	0.228	A	2,028	13,433	0.269	A	0.041	No
Otay Mesa Road											
Ocean View Hills Pkwy to Proj. W. Access	6P (6P)	60,000	16,330	0.272	A	4,976	21,306	0.355	A	0.083	No
Proj. W. Access to Emerald Crest Ct	6P (6P)	60,000	16,330	0.272	A	4,294	20,624	0.344	A	0.072	No
Emerald Crest Ct to Corporate Center Dr	6P (6P)	60,000	15,855	0.264	A	1,179	17,034	0.284	A	0.020	No
Corporate Center Dr to Innovative Dr	6P (6P)	60,000	10,499	0.175	A	943	11,442	0.191	A	0.016	No
Innovative Dr to Heritage Rd	6P (6P)	60,000	11,864	0.198	A	943	12,807	0.213	A	0.016	No

Notes: 6P=6 lane Prime, 6M = 6 lane Major, 5C=5 lane Collector, 4M=4 lane Major. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

TABLE 13: EXISTING WITH PROJECT FREEWAY VOLUMES AND LEVEL OF SERVICE

State Route	SR-905				SR-905			
Segment	I-805 to Caliente Ave				Caliente Ave to Britannia Blvd			
Existing Year 2016 ADT	79,000				70,000			
Peak Hour	A M		P M		A M		P M	
Direction	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	4	4	4	4	3	3	3	3
Capacity (1)	9,400	9,400	9,400	9,400	7,050	7,050	7,050	7,050
K Factor (2)	0.0761	0.0761	0.0902	0.0902	0.0761	0.0761	0.0902	0.0902
D Factor (3)	0.6624	0.3376	0.4124	0.5876	0.6624	0.3376	0.4124	0.5876
Truck Factor (4)	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811
Peak Hour Volume	4,520	2,304	3,335	4,752	4,005	2,041	2,955	4,211
Volume to Capacity	0.481	0.245	0.355	0.506	0.568	0.290	0.419	0.597
Existing LOS	B	A	B	C	C	A	B	C
Project Pk Hr Vol	15	23	41	32	8	5	11	14
E + P Pk Hr Vol	4,535	2,327	3,376	4,784	4,013	2,046	2,966	4,225
Volume to Capacity	0.482	0.248	0.359	0.509	0.569	0.290	0.421	0.599
E + P LOS	B	A	B	C	C	A	B	C
Increase in V/C	0.002	0.002	0.004	0.003	0.001	0.001	0.002	0.002
Significant Impact?	No	No	No	No	No	No	No	No

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) K factor from Caltrans, which is the percentage of AADT in both directions. (3) D factor from Caltrans, which when multiplied by K and ADT will provide peak hour volume. (4) Truck factor from Caltrans. E: Existing, P: Project. Excel rounding may result in ±1 above.

Under existing with project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersections of:

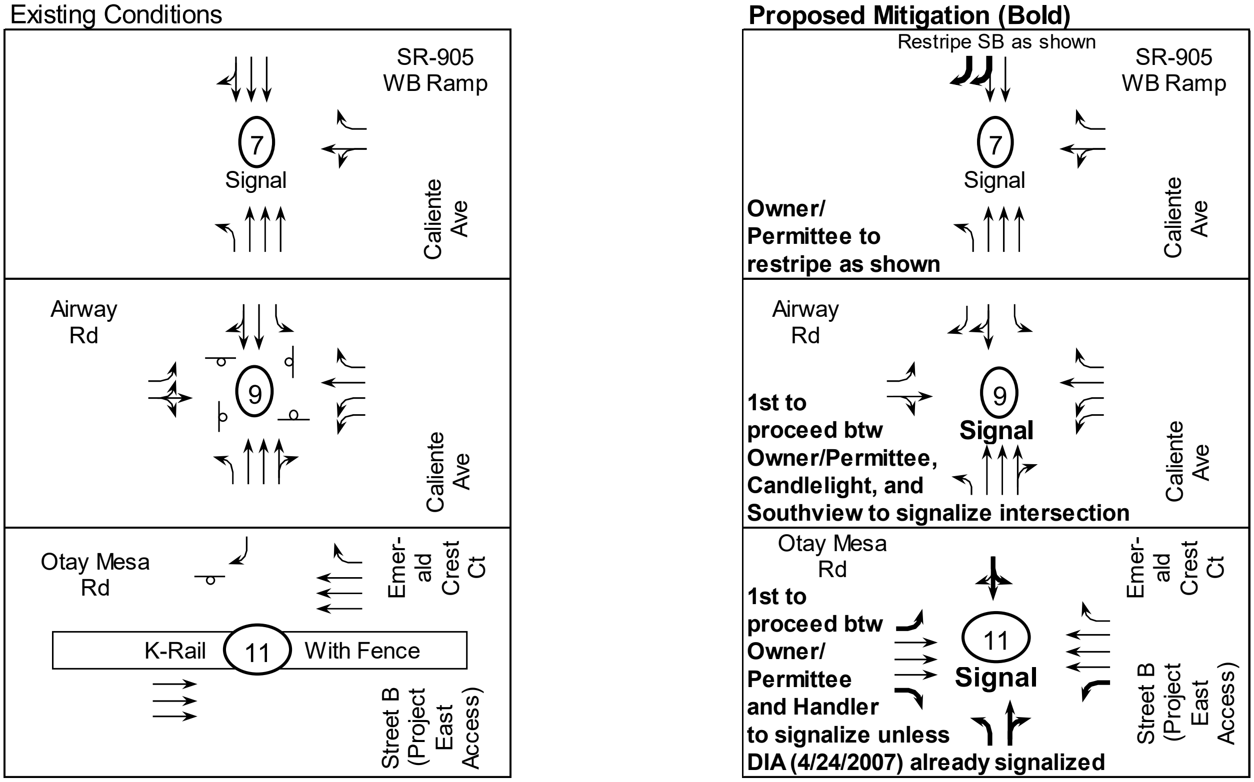
1) Caliente Avenue at SR-905 WB Ramp (LOS E PM),
2) Caliente Avenue at Airway Road (LOS F AM), and
3) Otay Mesa Road at Emerald Crest Ct (LOS F PM).

The project is calculated to have direct impacts at all three of the above intersections. The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

5.1 Existing with Project Proposed Mitigation

Three direct impacts are calculated to occur at the intersections of 1) Caliente Avenue/SR-905 WB Ramp, 2) Caliente Avenue/Airway Road, and 3) Otay Mesa Road/Emerald Crest Court. The applicant is proposing the mitigation measures shown in **Figure 10**.

Figure 10: Existing with Project Proposed Mitigation



The proposed mitigation measures are calculated to improve the intersection operations to below a level of significance as shown in **Table 14.** LOS calculation and concept striping for Caliente Avenue/SR-905 WB Ramp are included in **Appendix N**. Signal warrant calculations for intersection #9 (Caliente Avenue/Airway Road) are included in **Appendix O** while signal warrant calculations for Otay Mesa Road/Emerald Crest Court/Street B are included previously in Appendix J.

TABLE 14: EXISTING WITH PROJECT OPERATIONS WITH PROPOSED MITIGATION

Intersection	Move-ment	Study Period	Existing + Project Delay[2]	Existing + Project LOS[3]	Mitigation	Existing + Project (with Mit.) Delay[2]	LOS[3]	Delta[4]	Sig[5]
7) Caliente Ave at	All	AM	17.7	B	Restripe	16.7	B	-1.0	No
SR-905 WB Ramp (S)	All	PM	**61.4**	**E**	N. Leg	21.8	C	-39.6	No
9) Caliente Ave at	All	AM	**129.4**	**F**	Traffic	39.3	D	-90.1	No
Airway Rd (U)	All	PM	29.7	D	Signal	39.8	D	10.1	No
11) Otay Mesa Rd at	SB	AM	16.7	C		AM	All movements		
Emerald Crest Ct (U)	SB	PM	**116.9**	**F**	Traffic	14.7	B	NA	No
	NB	AM	33.5	D	Signal	PM	All movements		
	NB	PM	**317.4**	**F**		16.4	B	NA	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the change from mitigation. 5) Direct Impact if project traffic exceeds threshold. Bold indicated unacceptable LOS operations. Mit. = Mitigation.

The Otay Mesa Community Plan Update (CPU) Final EIR concluded that a significant impact would result at the intersection of Caliente Ave/SR-905 WB Ramp at community buildout. This impact was found to remain significant and unmitigated and a Statement of Overriding Considerations was adopted by the City. Under Existing Plus Project conditions, the applicant is proposing mitigation to reduce the direct impact at this intersection to below significance. Specifically, a mitigation measure is restriping the southbound approach of two through and one through-right turn lane (3 total approach lanes) to one through, one through-right, and one right turn lane (3 total approach lanes). The proposed restriping is an interim improvement until the City Public Facilities Financing Plan (PFFP) OM T-11.1 is completed (currently scheduled for 2026), which will add an additional southbound right turn lane from Caliente Ave to SR-905 WB Ramp resulting in 4 total approach lanes. The interim mitigation would reduce the significant impact at this intersection to less than significant. It is noted that the interim restriping will result in a temporary reduction (until year 2026 of the scheduled PFFP T-11.1 improvement) in the functional segment capacity of Caliente Avenue from Otay Mesa Road to SR-905 WB Ramp; however, as part of the project the applicant will construct a full raised median along the project frontage on Caliente Avenue to complete street improvements that include a raised median. With or without the Caliente Avenue street improvement (full width raised median), the segment is expected to operate at acceptable LOS as shown in **Table 15**.

TABLE 15: EXISTING WITH PROJECT CALIENTE AVE OPERATIONS

Segment	Classification: Ultimate and (Functional)	LOS E Capacity	Existing Daily Volume	Existing V/C	Existing LOS	Project Daily Volume	Existing + Project Daily Volume	V/C	LOS	Change in V/C	Project Impact?
Caliente Avenue (with reduced lane usage of a 4 lane collector)											
Otay Mesa Rd to SR-905 WB Ramp	6P (4C)	30,000	20,951	0.70	D	1,179	22,130	0.74	D	0.04	No
Caliente Avenue (with project median, the reduced lane usage is a 4 lane major)											
Otay Mesa Rd to SR-905 WB Ramp	6P (4M)	40,000	20,951	0.52	B	1,179	22,130	0.55	C	0.03	No

Notes: 6P=6 lane Prime, 4C=4 lane Collector. 4M=4 lane Major. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

The intersection of Caliente Ave/Airway Rd is also identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout. The project proposes mitigation for reduction of its direct significant impact through the installation of signal at this intersection. This intersection is also identified to be signalized as part of the Candlelight VTM Mitigation Monitoring and Reporting Program (MMRP) and Southview MMRP. Therefore, the first applicant to obtain building permits between this project and Candlelight will be required to signalize the intersection of Caliente Avenue at Airway Road, thereby reducing the significant impact to less than significant.

The intersection of Otay Mesa Road/Emerald Crest Court will be signalized by the first applicant to obtain building permits between this project and the adjacent Handler commercial project, unless it is completed beforehand as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007. The project improvements at this location also includes the removal of the K-Rail with fence and construction of a raised median in its place along the project frontage on Otay Mesa Road from Ocean View Hills Parkway/Caliente Avenue to Emerald Crest Court. The addition of Street B will result in a fourth leg to the intersection, and the median will not be constructed across the intersection, as it is in existing conditions. The intersection was analyzed as a T intersection under existing conditions, resulting in a significant direct impact. However, to mitigate the impact identified at the intersection of Otay Mesa Rd/Emerald Crest Ct/Street B, the intersection needs to be signalized. Implementation of this mitigation measure would reduce the significant impact to less than significant. A copy of the transportation section from the Otay Mesa CPU Final EIR, excerpts from the Otay Mesa PFFP, a copy of the Candlelight MMRP traffic signal requirement, Southview MMRP traffic signal requirement, and excerpts from the Otay Greenfield Developers Deferred Improvement Agreement are included in **Appendix P.**

6.0 Near-Term Year 2020 (Opening Day) without Project Conditions

The Near-Term without project conditions describe the anticipated roadway operations during the opening year of the project anticipated to be in 2020.

This scenario includes surrounding cumulative projects added to the existing traffic volumes. Upon review of available cumulative project information in Open DSD and discussion with City staff, the following cumulative projects were identified that are anticipated to add traffic to the study area roadways used by the project:

1) *7-Eleven* – A 2,940 sf convenience store located on the northwest corner of Ocean View Hills Parkway/Caliente Avenue and Otay Mesa Road.
2) *Azul Playa Del Sol/Luna (California Terraces PA 6)* – A residential project with up to 740 multi-family units located on the south corner of Ocean View Hills Parkway and Del Sol Blvd. Approximately 150 units were occupied when counts were collected in January 2018, resulting in a near term analysis that evaluates an additional 590 units.
3) *Cesar Solis Park* – A 15 acre city park generally located on the south side of Del Sol Blvd west of Ocean View Hills School.
4) *Candlelight* – A multi-family project with 475 units located on Caliente Avenue south of Airway Road.
5) *Southview* – A multi-family project with 277 units located on Airway Road east of Caliente Avenue.
6) *Southview East* – A multi-family project with 136 units located on Airway Road east of Caliente Avenue.
7) *Southwind* – A multi-family project with 100 units located west of Caliente Avenue and south of Airway Road.
8) *Handler Retail Center* – A retail center with 24,000 sf restaurant, 6,000 sf fast food, and 189 room motel located on the south side of Otay Mesa Road between Emerald Crest Court and Corporate Center Drive.
9) *Arco #5770* – A project that will add 2 additional fuel dispensers to an existing gas station located at 1625 Heritage Road.
10) *Marijuana Production Facility.* A marijuana project facility of 86,400 sf located at 1221 1/3 Innovative Drive.

Individual cumulative project assignments that are anticipated to add traffic to the study area roadways are included in **Appendix Q**. The cumulative project trip generation is summarized below in **Table 16**.

TABLE 16: CUMULATIVE PROJECT TRIP GENERATION

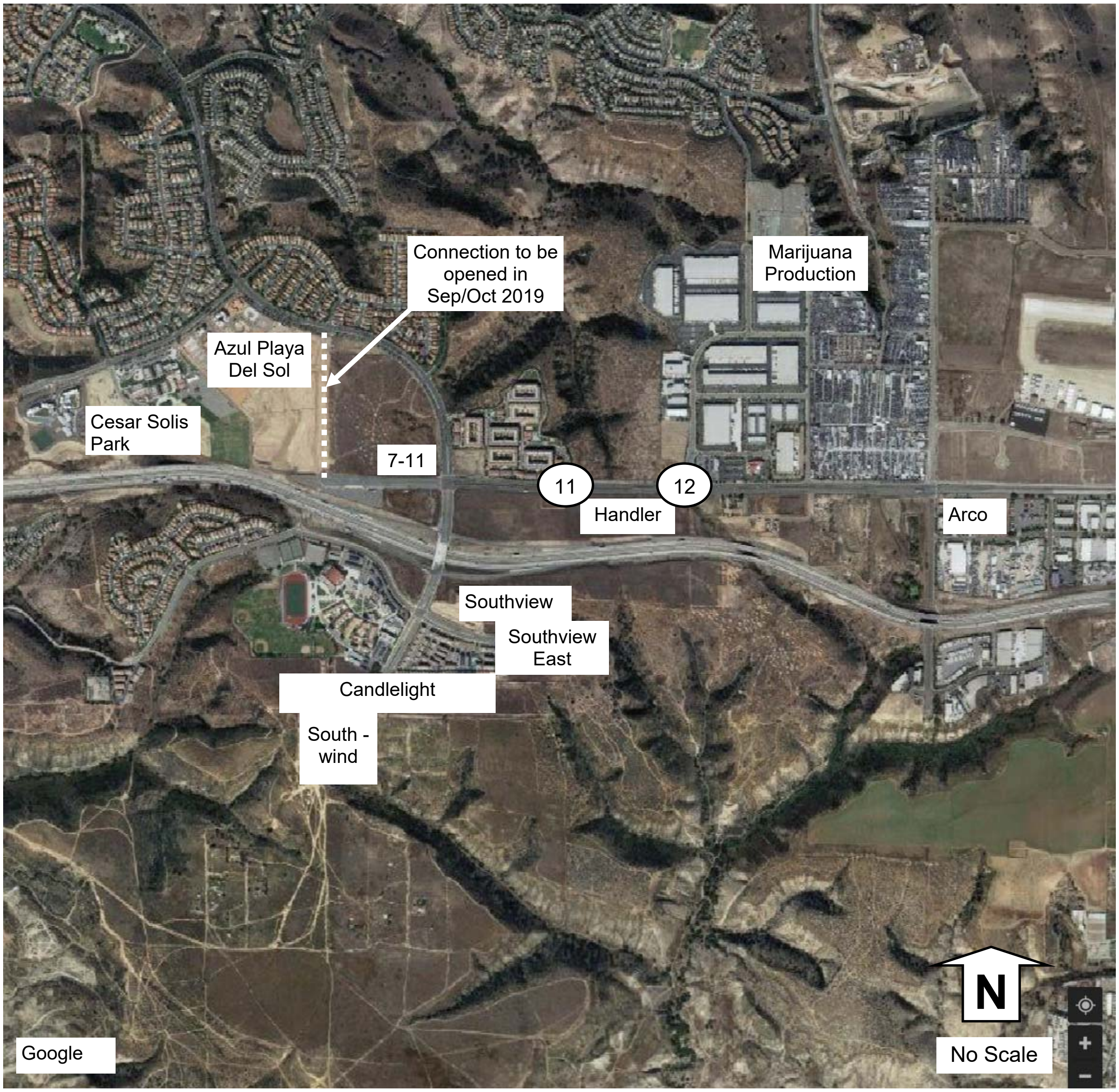
Cumulative Project and Source	Status	Rate		Size & Units		ADT	%	Split		AM IN	AM OUT	%	Split		PM IN	PM OUT
7-11 Convenience Store with Gas Pumps: LLG	U	150	/Pump	12	Pumps	**1,800**	8%	0.5	0.5	**72**	**72**	8%	0.5	0.5	**72**	**72**
Azul Playa Del Sol MF(<20 du/acre): Pardee	A	8	/DU	590	DU	**4,720**	8%	0.2	0.8	**76**	**302**	10%	0.7	0.3	**330**	**142**
Cesar Solis Park: Web	A	50	/Acre	15.0	Acres	**750**	4%	0.5	0.5	**15**	**15**	8%	0.5	0.5	**30**	**30**
Candlelight MF (>20 du/acre): KH	A	6	/DU	475	DU	**2,850**	8%	0.2	0.8	**46**	**182**	9%	0.7	0.3	**180**	**77**
Southview MF (<20 du/acre): KH	A	8	/DU	277	DU	**2,216**	8%	0.2	0.8	**35**	**142**	10%	0.7	0.3	**155**	**66**
Southview East MF (<20 du/acre): KH	A	8	/DU	136	DU	**1,088**	8%	0.2	0.8	**17**	**70**	10%	0.7	0.3	**76**	**33**
Southwind MF (<20 du/acre): KH	U	8	/DU	100	DU	**800**	8%	0.2	0.8	**13**	**51**	10%	0.7	0.3	**56**	**24**
Handler Motel: MBI	A	9	/Room	189	Rooms	**1,701**	8%	0.4	0.6	**54**	**82**	9%	0.4	0.6	**61**	**92**
Handler Restaurant (sit down high turnover): MBI	A	130	/KSF	24,000	SF	**3,120**	8%	0.5	0.5	**125**	**125**	8%	0.6	0.4	**150**	**100**
Handler Fast Food (with drive-through): MBI	A	700	/KSF	6,000	SF	**4,200**	4%	0.6	0.4	**101**	**67**	8%	0.5	0.5	**168**	**168**
ARCO add 2 pumps: CityDSD	U	150	/Pump	2	Pumps	**300**	8%	0.5	0.5	**12**	**12**	8%	0.5	0.5	**12**	**12**
Innovative Dr Marijuana Production Facility: CityDSD	U	4	/KSF	86,400	SF	**346**	20%	0.9	0.1	**62**	**7**	20%	0.2	0.8	**14**	**55**
Cumulative Project Traffic:						**23,891**				**628**	**1,127**				**1,304**	**871**

Source: City of San Diego *Trip Generation Manual*, May 2003. Notes: AC-Acre; KSF - 1,000 Square Feet; MF - Multi-Family; Status: (U) Under Review, (A) Approved, not constructed when traffic data was collected. Source: LLG: Linscott, Law, & Greenspan, Pardee: Pardee Homes, CityDSD: City of San Diego Open Department Services Department website, KH: Kimley-Horn, MBI: Michael Baker International.

A map showing the cumulative project locations along with study area roadway changes (i.e. improvements by the Handler cumulative project or a planned roadway opening) are shown on **Figure 11**. The Handler improvements include a right-in/right-out access at Otay Mesa Road/Emerald Crest Ct (intersection #11) along with full street improvements on Street B (southern extension of Emerald Crest Dr) and the addition of a south leg and additional lanes to the existing signalized intersection of Otay Mesa Rd/Corporate Center Dr (intersection #12). The Handler improvements will be implemented when they proceed with their project, which is unknown at this time, so they are not assumed in the Near-Term baseline condition. The combined cumulative project traffic volumes are shown on **Figure 12**.

Near-term (2020) traffic volumes (existing + cumulative) without the project are shown on **Figure 13**. The LOS under near-term conditions (2020) representing (existing + cumulative) are shown in **Tables 17 through 19**. LOS calculations are included in **Appendix R**.

Figure 11: Cumulative Project Locations and Cumulative Project Improvements



Bold notation identifies improvement by cumulative project

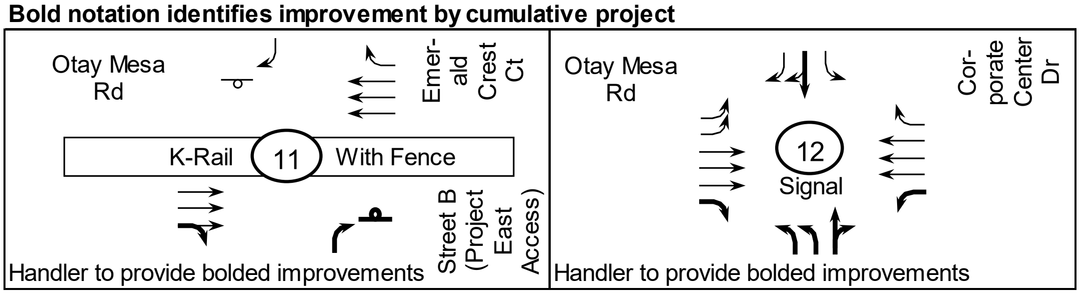


Figure 12: Cumulative Project Volumes

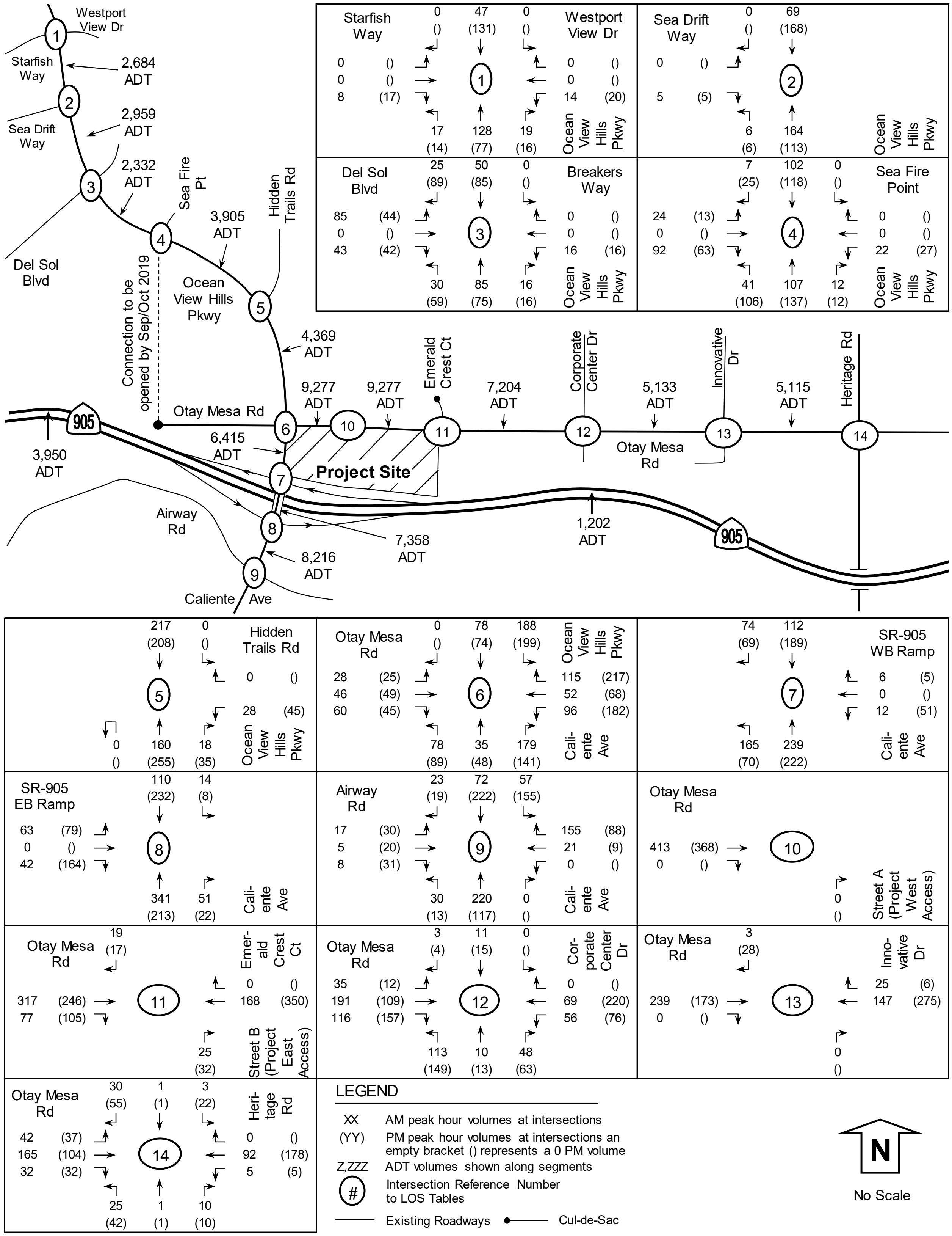


Figure 13: Near-Term Year 2020 (Opening Day) without Project Volumes

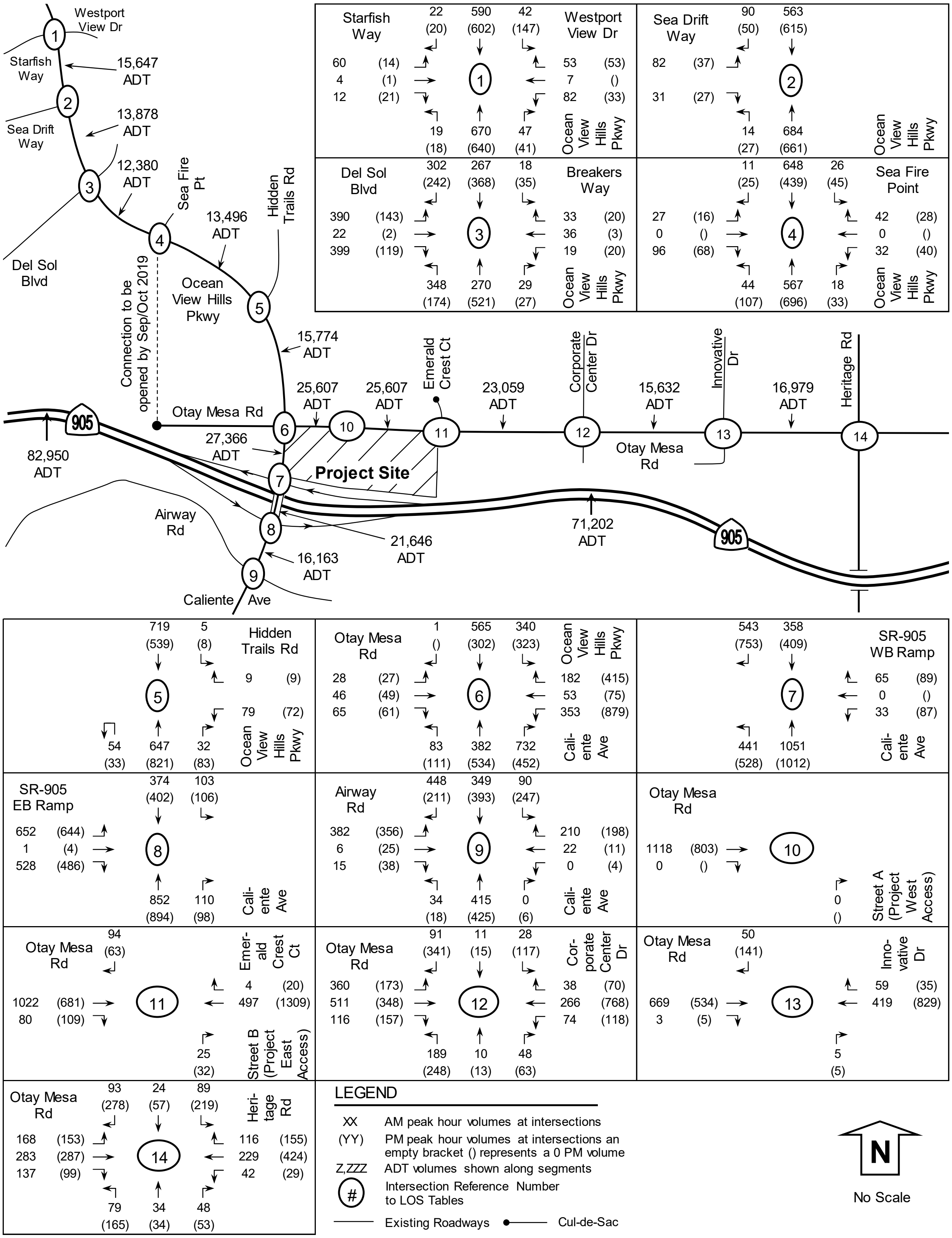


TABLE 17: NEAR-TERM YEAR 2020 (OPENING DAY) WITHOUT PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis)[1]	Movement	Peak Hour	Near-Term 2020 Delay[2]	Near-Term 2020 LOS[3]
1) Ocean View Hills Pkwy	All	AM	18.2	B
at Starfish/Westport (S)	All	PM	16.8	B
2) Ocean View Hills Pkwy	EB LR	AM	18.9	C
at Sea Drift Wy (U)	NB L	AM	9.2	A
	EB LR	PM	16.1	C
	NB L	PM	9.3	A
3) Ocean View Hills Pkwy	All	AM	35.3	D
at Del Sol/Breakers (S)	All	PM	19.2	B
4) Ocean View Hills Pkwy	All	AM	14.9	B
at Sea Fire Pt (S)	All	PM	15.5	B
5) Ocean View Hills Pkwy	All	AM	5.1	A
at Hidden Trails Rd (S)	All	PM	5.5	A
6) Ocean View Hills Pkwy	All	AM	31.1	C
at Caliente/Otay Mesa (S)	All	PM	43.0	D
7) Caliente Ave at	All	AM	15.5	B
SR-905 WB Ramp (S)	All	PM	**57.3**	**E**
8) Caliente Ave at	All	AM	34.2	C
SR-905 EB Ramp (S)	All	PM	30.4	C
9) Caliente Ave at	All	AM	**104.3**	**F**
Airway Rd (U)	All	PM	**50.7**	**F**
10) Otay Mesa Rd at	NB R	AM	DNE	NA
Project West Access (U)	NB R	PM	DNE	NA
11) Otay Mesa Rd at	SB R	AM	15.2	C
Emerald Crest Ct (U)	SB R	PM	19.2	C
	NB R	AM	11.9	B
	NB R	PM	12.9	B
12) Otay Mesa Rd at	All	AM	39.5	D
Corporate Center Rd (S)	All	PM	36.0	C
13) Otay Mesa Rd at	NB R	AM	11.7	B
Innovative Dr (U)	SB R	AM	10.9	B
	NB R	PM	11.1	B
	SB R	PM	16.1	C
14) Otay Mesa Rd at	All	AM	29.8	C
Heritage Rd (S)	All	PM	36.1	D

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. DNE: Does not exist. NA: Not Applicable. Bold indicates unacceptable LOS. Note: Intersections 11 and 13 are right-in, right-out only.

TABLE 18: NEAR-TERM YEAR 2020 (OPENING DAY) WITHOUT PROJECT SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Daily	Classification: Ultimate and (Functional)	LOS E Capacity	Near-Term 2020 Daily Volume	Near-Term 2020 V/C	Near-Term 2020 LOS
Caliente Avenue					
Otay Mesa Rd to SR-905 WB Ramp	6P (5C)	35,000	27,366	0.782	D
SR-905 EB Ramp to SR-905 EB Ramp	6P (5C)	35,000	21,646	0.618	C
SR-905 EB Ramp to Airway Rd	6P (5C)	35,000	16,163	0.462	B
Ocean View Hills Parkway					
Starfish Way/Westport View to Sea Drift Way	4M (4M)	40,000	15,647	0.391	B
Sea Drift Way to Del Sol Blvd	4M (4M)	40,000	13,878	0.347	A
Del Sol Blvd to Sea Fire Pt	6M (6M)	50,000	12,380	0.248	A
Sea Fire Pt to Hidden Trails Rd	6M (6M)	50,000	13,496	0.270	A
Hidden Trails Rd to Otay Mesa Rd	6M (6M)	50,000	15,774	0.315	A
Otay Mesa Road					
Ocean View Hills Pkwy to Proj. W. Access	6P (6P)	60,000	25,607	0.427	B
Proj. W. Access to Emerald Crest Ct	6P (6P)	60,000	25,607	0.427	B
Emerald Crest Ct to Corporate Center Dr	6P (6P)	60,000	23,059	0.384	A
Corporate Center Dr to Innovative Dr	6P (6P)	60,000	15,632	0.261	A
Innovative Dr to Heritage Rd	6P (6P)	60,000	16,979	0.283	A

Notes: 6P=6 lane Prime, 6M = 6 lane Major, 5C=5 lane Collector, 4M=4 lane Major. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

TABLE 19: NEAR-TERM YEAR 2020 (OPENING DAY) WITHOUT PROJECT FREEWAY VOLUMES AND LEVEL OF SERVICE

State Route	**SR-905**				**SR-905**			
Segment	I-805 to Caliente Ave				Caliente Ave to Britannia Blvd			
Existing Year 2016 ADT	79,000				70,000			
Peak Hour	A M		P M		A M		P M	
Direction	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	4	4	4	4	3	3	3	3
Capacity (1)	9400	9400	9400	9400	7050	7050	7050	7050
K Factor (2)	0.0761	0.0761	0.0902	0.0902	0.0761	0.0761	0.0902	0.0902
D Factor (3)	0.6624	0.3376	0.4124	0.5876	0.6624	0.3376	0.4124	0.5876
Truck Factor (4)	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811
Peak Hour Volume	4,520	2,304	3,335	4,752	4,005	2,041	2,955	4,211
Volume to Capacity	0.481	0.245	0.355	0.506	0.568	0.290	0.419	0.597
Existing LOS	B	A	B	C	C	A	B	C
Cumulative Pk Hr Vol	63	74	79	69	14	6	8	5
E + C Pk Hr Vol	4,583	2,378	3,414	4,821	4,019	2,047	2,963	4,216
Volume to Capacity	0.488	0.253	0.363	0.513	0.570	0.290	0.420	0.598
E + C LOS	B	A	B	C	C	A	B	C

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) K factor from Caltrans, which is the percentage of AADT in both directions. (3) D factor from Caltrans, which when multiplied by K and ADT will provide peak hour volume. (4) Truck factor from Caltrans. E: Existing, P: Project. Excel rounding may result in ±1 above.

Under Near-Term year 2020 (opening day) without project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersections of:

1) Caliente Avenue at SR-905 WB Ramp (LOS E PM), and
2) Caliente Avenue at Airway Road (LOS F AM and PM).

The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

7.0 Near-Term Year 2020 with Project (Opening Day) Conditions

This scenario documents the addition of project traffic onto Near-Term year 2020 (opening day) traffic for AM peak hour, PM peak hour, and daily conditions with volumes shown in **Figure 14**. LOS for near-term with project conditions are shown in **Tables 20 through 22**. LOS calculations are included in **Appendix S**.

TABLE 20: NEAR-TERM YEAR 2020 (OPENING DAY) WITH PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and	Movement	Peak	Near-Term 2020		Near-Term 2020 with Project			
(Analysis)[1]		Hour	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	Impact[5]
1) Ocean View Hills Pkwy	All	AM	18.2	B	18.8	B	0.6	No
at Starfish/Westport (S)	All	PM	16.8	B	17.8	B	1.0	No
2) Ocean View Hills Pkwy	EB LR	AM	18.9	C	19.6	C	0.7	No
at Sea Drift Wy (U)	NB L	AM	9.2	A	9.3	A	0.1	No
	EB LR	PM	16.1	C	16.9	C	0.8	No
	NB L	PM	9.3	A	9.5	A	0.2	No
3) Ocean View Hills Pkwy	All	AM	35.3	D	36.2	D	0.9	No
at Del Sol/Breakers (S)	All	PM	19.2	B	20.2	C	1.0	No
4) Ocean View Hills Pkwy	All	AM	14.9	B	14.9	B	0.0	No
at Sea Fire Pt (S)	All	PM	15.5	B	15.6	B	0.1	No
5) Ocean View Hills Pkwy	All	AM	5.1	A	5.2	A	0.1	No
at Hidden Trails Rd (S)	All	PM	5.5	A	5.7	A	0.2	No
6) Ocean View Hills Pkwy	All	AM	31.1	C	42.6	D	11.5	No
at Caliente/Otay Mesa (S)	All	PM	43.0	D	49.3	D	6.3	No
7) Caliente Ave at	All	AM	15.5	B	16.2	B	0.7	No
SR-905 WB Ramp (S)	All	PM	**57.3**	**E**	**66.6**	**E**	**9.3**	**Yes**
8) Caliente Ave at	All	AM	34.2	C	35.7	D	1.5	No
SR-905 EB Ramp (S)	All	PM	30.4	C	32.1	C	1.7	No
9) Caliente Ave at	All	AM	**104.3**	**F**	**107.7**	**F**	**3.4**	**Yes**
Airway Rd (U)	All	PM	**50.7**	**F**	**54.2**	**F**	**3.5**	**Yes**
10) Otay Mesa Rd at	NB R	AM	DNE	NA	18.1	C	NA	No
Project West Access (U)	NB R	PM	DNE	NA	16.9	C	NA	No
11) Otay Mesa Rd at	SB R	AM	15.2	C	50.0	**F**	**34.8**	**Yes**
Emerald Court/Street B	SB R	PM	19.2	C	36.5	**E**	**17.3**	**Yes**
Project Access (U)	NB R	AM	11.9	B	565.7	**F**	**553.8**	**Yes**
	NB R	PM	12.9	B	729.9	**F**	**717.0**	**Yes**
12) Otay Mesa Rd at	All	AM	39.5	D	39.8	D	0.3	No
Corporate Center Rd (S)	All	PM	36.0	C	36.8	D	0.8	No
13) Otay Mesa Rd at	NB R	AM	11.7	B	11.9	B	0.2	No
Innovative Dr (U)	SB R	AM	10.9	B	11.1	B	0.2	No
	NB R	PM	11.1	B	11.3	B	0.2	No
	SB R	PM	16.1	C	16.9	C	0.8	No
14) Otay Mesa Rd at	All	AM	29.8	C	29.8	C	0.0	No
Heritage Rd (S)	All	PM	36.1	D	36.6	D	0.5	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Impact if project traffic exceeds threshold. DNE: Does not exist. NA: Not Applicable. Bold indicates unacceptable LOS and/or project impact. Note: Intersections 11 and 13 are right-in, right-out only.

Figure 14: Near-Term Year 2020 (Opening Day) with Project Volumes

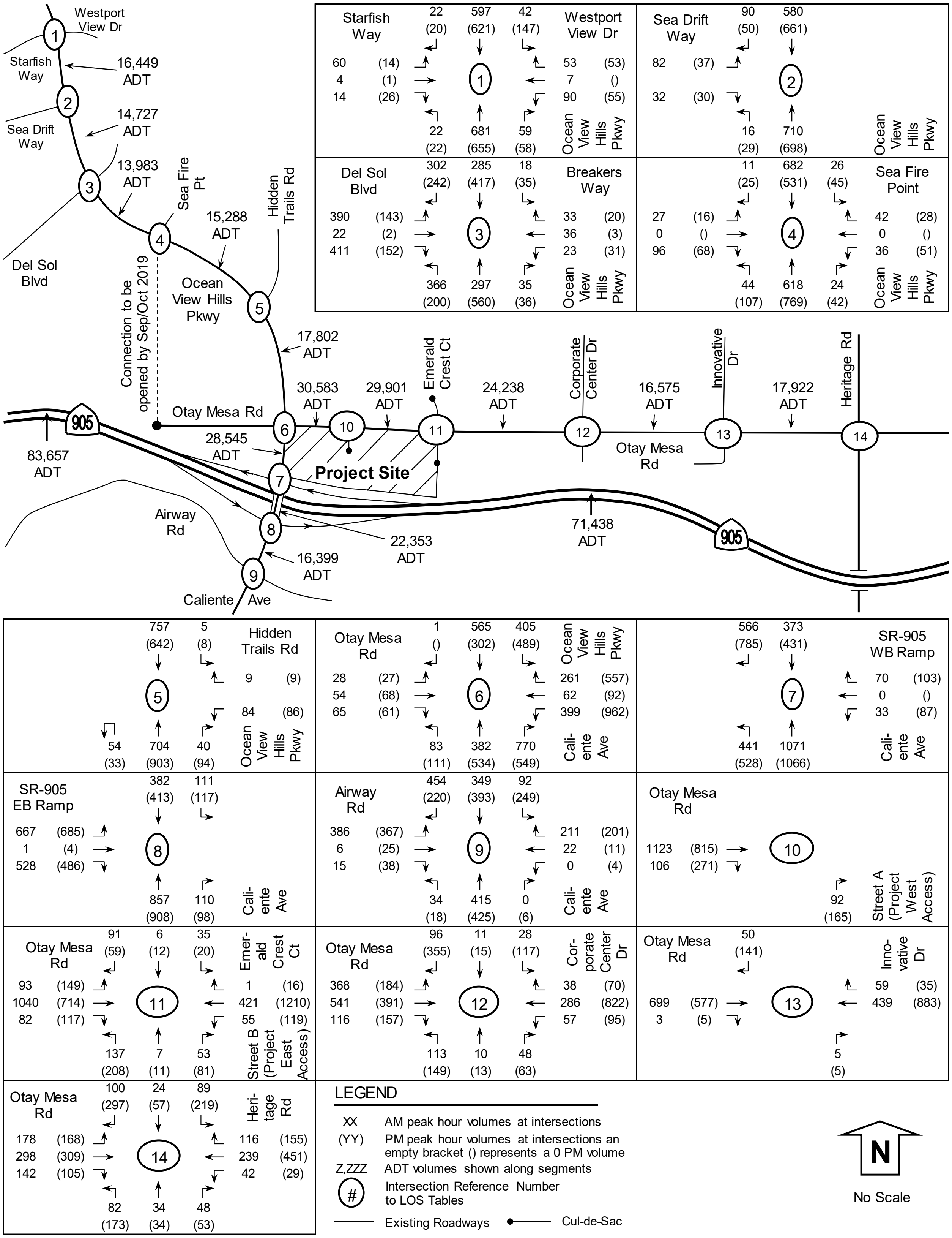


TABLE 21: NEAR-TERM YEAR 2020 (OPENING DAY) WITH PROJECT SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Segment	Classification: Ultimate and (Functional)	LOS E Capacity	Near-Term 2020 Daily Volume	Near-Term 2020 V/C	Near-Term 2020 LOS	Project Daily Volume	Near-Term 2020 with Project Daily Volume	Near-Term 2020 with Project V/C	Near-Term 2020 with Project LOS	Change in V/C	Project Impact?
Caliente Avenue											
Otay Mesa Rd to SR-905 WB Ramp	6P (5C)	35,000	27,366	0.782	D	1,179	28,545	0.816	D	0.034	No
SR-905 EB Ramp to SR-905 EB Ramp	6P (5C)	35,000	21,646	0.618	C	707	22,353	0.639	C	0.020	No
SR-905 EB Ramp to Airway Rd	6P (5C)	35,000	16,163	0.462	B	236	16,399	0.469	B	0.007	No
Ocean View Hills Parkway											
Starfish Way/Westport View to Sea Drift Way	4M (4M)	40,000	15,647	0.391	B	802	16,449	0.411	B	0.020	No
Sea Drift Way to Del Sol Blvd	4M (4M)	40,000	13,878	0.347	A	849	14,727	0.368	A	0.021	No
Del Sol Blvd to Sea Fire Pt	6M (6M)	50,000	12,380	0.248	A	1,603	13,983	0.280	A	0.032	No
Sea Fire Pt to Hidden Trails Rd	6M (6M)	50,000	13,496	0.270	A	1,792	15,288	0.306	A	0.036	No
Hidden Trails Rd to Otay Mesa Rd	6M (6M)	50,000	15,774	0.315	A	2,028	17,802	0.356	A	0.041	No
Otay Mesa Road											
Ocean View Hills Pkwy to Proj. W. Access	6P (6P)	60,000	25,607	0.427	B	4,976	30,583	0.510	B	0.083	No
Proj. W. Access to Emerald Crest Ct	6P (6P)	60,000	25,607	0.427	B	4,294	29,901	0.498	B	0.072	No
Emerald Crest Ct to Corporate Center Dr	6P (6P)	60,000	23,059	0.384	A	1,179	24,238	0.404	A	0.020	No
Corporate Center Dr to Innovative Dr	6P (6P)	60,000	15,632	0.261	A	943	16,575	0.276	A	0.016	No
Innovative Dr to Heritage Rd	6P (6P)	60,000	16,979	0.283	A	943	17,922	0.299	A	0.016	No

Notes: 6P=6 lane Prime, 6M = 6 lane Major, 5C=5 lane Collector, 4M=4 lane Major. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

TABLE 22: NEAR-TERM YEAR 2020 (OPENING DAY) WITH PROJECT FREEWAY VOLUMES AND LEVEL OF SERVICE

State Route	SR-905				SR-905			
Segment	I-805 to Caliente Ave				Caliente Ave to Britannia Blvd			
Existing Year 2016 ADT	79,000				70,000			
Peak Hour	A M		P M		A M		P M	
Direction	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	4	4	4	4	3	3	3	3
Capacity (1)	9,400	9,400	9,400	9,400	7,050	7,050	7,050	7,050
K Factor (2)	0.0761	0.0761	0.0902	0.0902	0.0761	0.0761	0.0902	0.0902
D Factor (3)	0.6624	0.3376	0.4124	0.5876	0.6624	0.3376	0.4124	0.5876
Truck Factor (4)	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811
Peak Hour Volume	4,520	2,304	3,335	4,752	4,005	2,041	2,955	4,211
Volume to Capacity	0.481	0.245	0.355	0.506	0.568	0.290	0.419	0.597
Existing LOS	B	A	B	C	C	A	B	C
E + C Pk Hr Vol	4,583	2,378	3,414	4,821	4,019	2,047	2,963	4,216
Volume to Capacity	0.4875	0.2529	0.3632	0.5129	0.5700	0.2904	0.4203	0.5980
E+C LOS	B	A	B	C	C	A	B	C
Project Pk Hr Vol	15	23	41	32	8	5	11	14
E+C+P Pk Hr Vol	4,598	2,401	3,455	4,853	4,027	2,052	2,974	4,230
Volume to Capacity	0.4891	0.2554	0.3676	0.5163	0.5712	0.2911	0.4219	0.6000
E + C + P LOS	B	A	B	C	C	A	B	C
Increase in V/C	0.002	0.002	0.004	0.003	0.001	0.001	0.002	0.002
Significant Impact?	No	No	No	No	No	No	No	No

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) K factor from Caltrans, which is the percentage of AADT in both directions. (3) D factor from Caltrans, which when multiplied by K and ADT will provide peak hour volume. (4) Truck factor from Caltrans. E: Existing, P: Project. Excel rounding may result in ±1 above.

Under near-term year 2020 (opening day) with project conditions, all the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersections of:

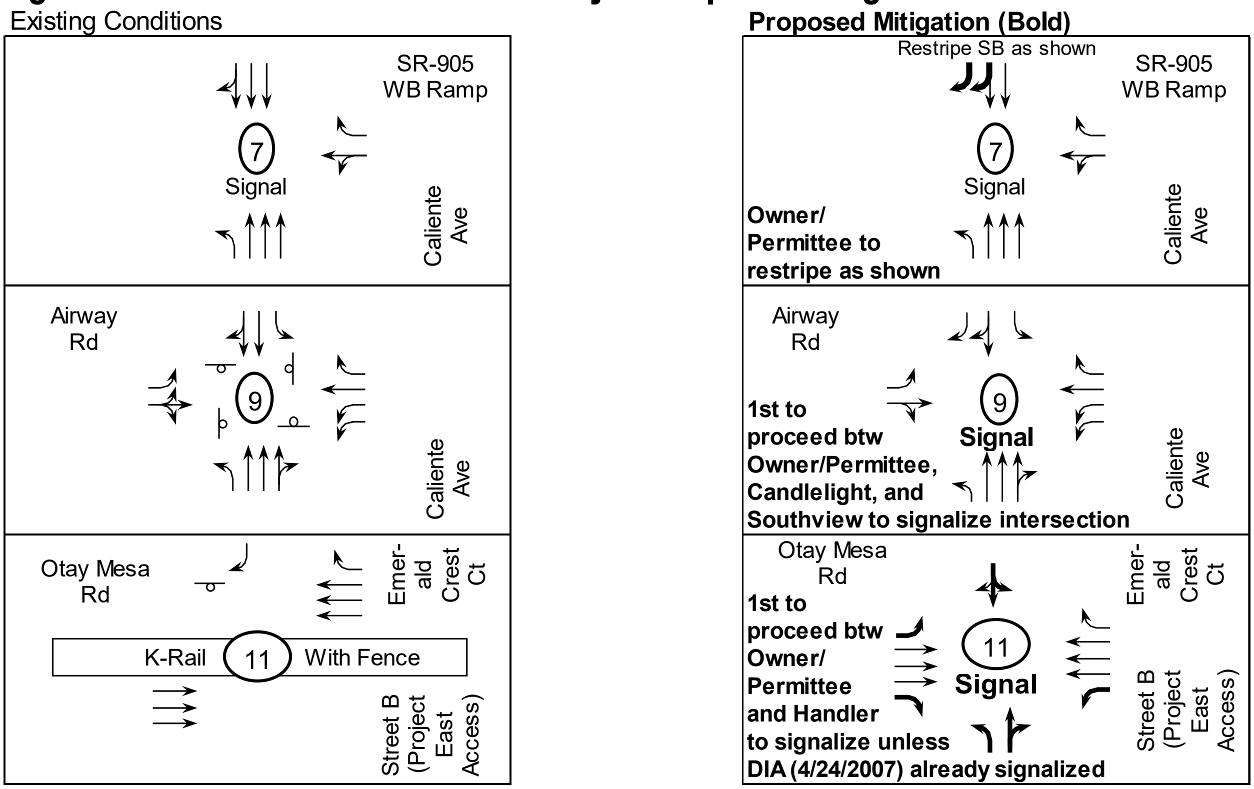
1) Caliente Avenue at SR-905 WB Ramp (LOS E PM),
2) Caliente Avenue at Airway Road (LOS F AM & PM), and
3) Otay Mesa Road at Emerald Crest Ct (LOS E & F AM & PM).

The project is calculated to have direct impacts at all three of the above intersections. The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

7.1 Near Term Year 2020 with Project Proposed Mitigation

Three direct impacts are calculated to occur at the intersections of 1) Caliente Avenue/SR-905 WB Ramp, 2) Caliente Avenue/Airway Road, and 3) Otay Mesa Road/Emerald Crest Court/Street B. The applicant is proposing the mitigation measures shown in **Figure 15**.

Figure 15: Near Term Year 2020 with Project Proposed Mitigation



The proposed mitigation measures are calculated to improve the intersection operations to below a level of significance as shown in **Table 23** (calculation included in **Appendix T**). Signal warrant calculations for intersection #9 (Caliente Avenue/Airway Road) are included in Appendix O while signal warrant calculations for Otay Mesa Road/Emerald Crest Court/Street B were included previously in Appendix J.

TABLE 23: NEAR TERM 2020 WITH PROJECT OPERATIONS WITH PROPOSED MITIGATION

Intersection	Move-ment	Study Period	Near-Term + Proj. Delay[2]	LOS[3]	Mitigation	Near-Term + Project (with Mit.) Delay[2]	LOS[3]	Delta[4]	Sig[5]
7) Caliente Ave at	All	AM	16.2	B	Restripe	16.3	B	0.1	No
SR-905 WB Ramp (S)	All	PM	**66.6**	**E**	N. Leg	23.6	C	-43.0	No
9) Caliente Ave at	All	AM	**107.7**	**F**	Traffic	50.7	D	-57.0	No
Airway Rd (U)	All	PM	**54.2**	**F**	Signal	32.7	C	-21.5	No
11) Otay Mesa Rd at	SB	AM	**50.0**	**F**		AM	All movements		
Emerald Crest Ct (U)	SB	PM	**36.5**	**E**	Traffic	17.3	B	NA	No
	NB	AM	**565.7**	**F**	Signal	PM	All movements		
	NB	PM	**729.9**	**F**		21.7	C	NA	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the change from mitigation. 5) Direct Impact if project traffic exceeds threshold. Bold indicated unacceptable LOS operations. Mit. = Mitigation.

The Otay Mesa CPU Final EIR concluded that a significant impact would result at the intersection of Caliente Ave/SR-905 WB Ramp at community buildout. This impact was found to remain significant and unmitigated and a Statement of Overriding Considerations was adopted by the City. The applicant is proposing mitigation to reduce the project's direct impact at this intersection to below significance by restriping the southbound approach of two through and one through-right turn lane (3 total approach lanes) to one through, one through-right, and one right turn lane (3 total approach lanes). The proposed restriping is an interim improvement until the City Public Facilities Financing Plan (PFFP) OM T-11.1 is completed (currently scheduled for 2026), which will add an additional southbound right turn lane from Caliente Ave to SR-905 WB Ramp resulting in 4 total approach lanes. The interim mitigation would reduce the significant impact at this intersection to less than significant. It is noted that the interim restriping will result in a temporary reduction in the functional segment capacity of Caliente Avenue from Otay Mesa Road to SR-905 WB Ramp; however, as part of the project the applicant will construct a raised median along the project frontage on Caliente Avenue to fulfill the code requirements to complete street improvements that include a raised median. Without the Caliente Avenue street improvement (raised median), the segment is calculated to operate at unacceptable LOS; however, with the raised median, the segment is calculated to operate at acceptable LOS as shown in **Table 24**.

TABLE 24: NEAR TERM 2020 WITH PROJECT CALIENTE AVE OPERATIONS

Segment	Classification: Ultimate and (Functional)	LOS E Capacity	Near-Term Daily Volume	V/C	LOS	Project Daily Volume	Near-Term with Project Daily Volume	V/C	LOS	Change in V/C	Project Impact?
Caliente Avenue (with reduced lane usage of a 4 lane collector)											
Otay Mesa Rd to SR-905 WB Ramp	6P (4C)	30,000	27,366	0.91	**E**	1,179	28,545	0.95	**E**	0.04	**Yes**
Caliente Avenue (with project median, the reduced lane usage is a 4 lane major)											
Otay Mesa Rd to SR-905 WB Ramp	6P (4M)	40,000	27,366	0.68	C	1,179	28,545	0.71	C	0.03	No

Notes: 6P=6 lane Prime, 4C=4 lane Collector, 4M=4 lane Major. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio. Bold indicates unaccetable LOS and/or impact.

The intersection of Caliente Ave/Airway Rd is also identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout resulting in the adoption of overriding considerations. The project proposes mitigation for reduction of its significant impact through the installation of signal at this intersection. It is noted that this intersection is also identified to be signalized as part of the Candlelight VTM Mitigation Monitoring and Reporting Program (MMRP). Therefore, the first applicant to obtain building permits between this project and Candlelight will be required to implement the mitigation measure and signalize the intersection of Caliente Avenue at Airway Road thereby reducing the significant impact to less than significant.

The project includes the removal of the K-Rail with fence along the project frontage on Otay Mesa Road from Caliente Avenue to Emerald Crest Court and the construction of a raised median in its place. However, to mitigate the impact identified at the intersection of Otay Mesa Rd/Emerald Crest Ct/Street B with full turning movements allowed requires a traffic signal. The intersection of Caliente Ave/Emerald Crest Court will be signalized by the first applicant to obtain building permits between this project and the adjacent Handler commercial project, unless it is completed beforehand as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007.. Implementation of this mitigation measure would reduce the significant impact to less than significant.

A copy of the transportation section from the Otay Mesa CPU Final EIR, excerpts from the Otay Mesa PFFP, a copy of the Candlelight MMRP traffic signal requirement, and Southview MMRP traffic signal requirement are included in Appendix P.

8.0 Horizon Year 2062 without Project Conditions

A Horizon Year of 2062 was used for consistency with the current Otay Mesa Community Plan. The Horizon Year 2062 growth forecast was based on a formula provided by City of San Diego staff to calculate future year daily traffic volumes for Otay Mesa Road, Ocean View Hills Parkway, and SR-905. A compound growth rate was calculated by segment using SANDAG Series 12 unadjusted regional travel demand model volumes as follows:

$$\text{Compound growth} = (\text{2050 unadjusted ADT} / \text{2020 unadjusted ADT})^{1/N} - 1$$

Where N = number of years (2050 – 2020 = 30 years)

The compound growth rate was applied for a period of 44 years to existing segment counts collected in 2018 to represent year 2062 daily traffic volumes (2062 – 2018 = 44). Calculations are included in **Appendix U**. The Horizon Year 2062 volumes for Caliente Avenue were taken from the Otay Mesa CPU EIR due to the proximity of Southwest Village (details included on Figure 5.12-3a in Appendix P). The Otay Mesa CPU EIR did not include a segment volume on the Caliente Ave bridge over SR-905, therefore, the bridge volume was interpolated using the ratio of volumes in the SANDAG Series 13 to the two known CPU EIR volumes as shown in **Table 25** (shaded cell represents unknown ADT that was interpolated from known ADTs).

TABLE 25: CALIENTE AVENUE HORIZON YEAR 2062 BRIDGE VOLUME INTERPOLATION

Segment	Series 13 2050 ADT	CPU EIR 2062 ADT	Rounded 2062 ADT
Caliente from Otay Mesa to SR-905 WB Ramp	21,615	38,000	
Caliente from SR-905 WB Ramp to EB Ramp	23,441	*33,237*	**33,200**
Caliente from SR-905 EB Ramp to Airway Rd	23,915	32,000	

Shaded represents the unknown ADT that was interpolated from known (unshaded) ADTs.

Intersection turning movement forecasts were based on the increase in daily volumes for each intersection approach (calculations included in **Appendix V**).

Horizon Year 2062 conditions showing the study area roadway changes (i.e. improvements by the Handler project) are shown in **Figure 16**. The Handler improvements include a right-in/right-out only access at Otay Mesa Road/Emerald Crest Ct (intersection #11) along with full street improvements on Street B (southern extension of Emerald Crest Dr) and the addition of a south leg and additional lanes to the existing signalized intersection of Otay Mesa Rd/Corporate Center Dr (intersection #12). Additionally, the SR-905/Caliente Ave on-ramp meters were analyzed using discharge rates from the Otay Mesa CPU EIR.

The Horizon Year 2062 volumes without the project are shown in **Figure 17.** LOS and ramp meter operations are shown in **Tables 26 through 29** with calculations included in **Appendix W**.

Figure 16: Horizon Year 2062 without Project Conditions

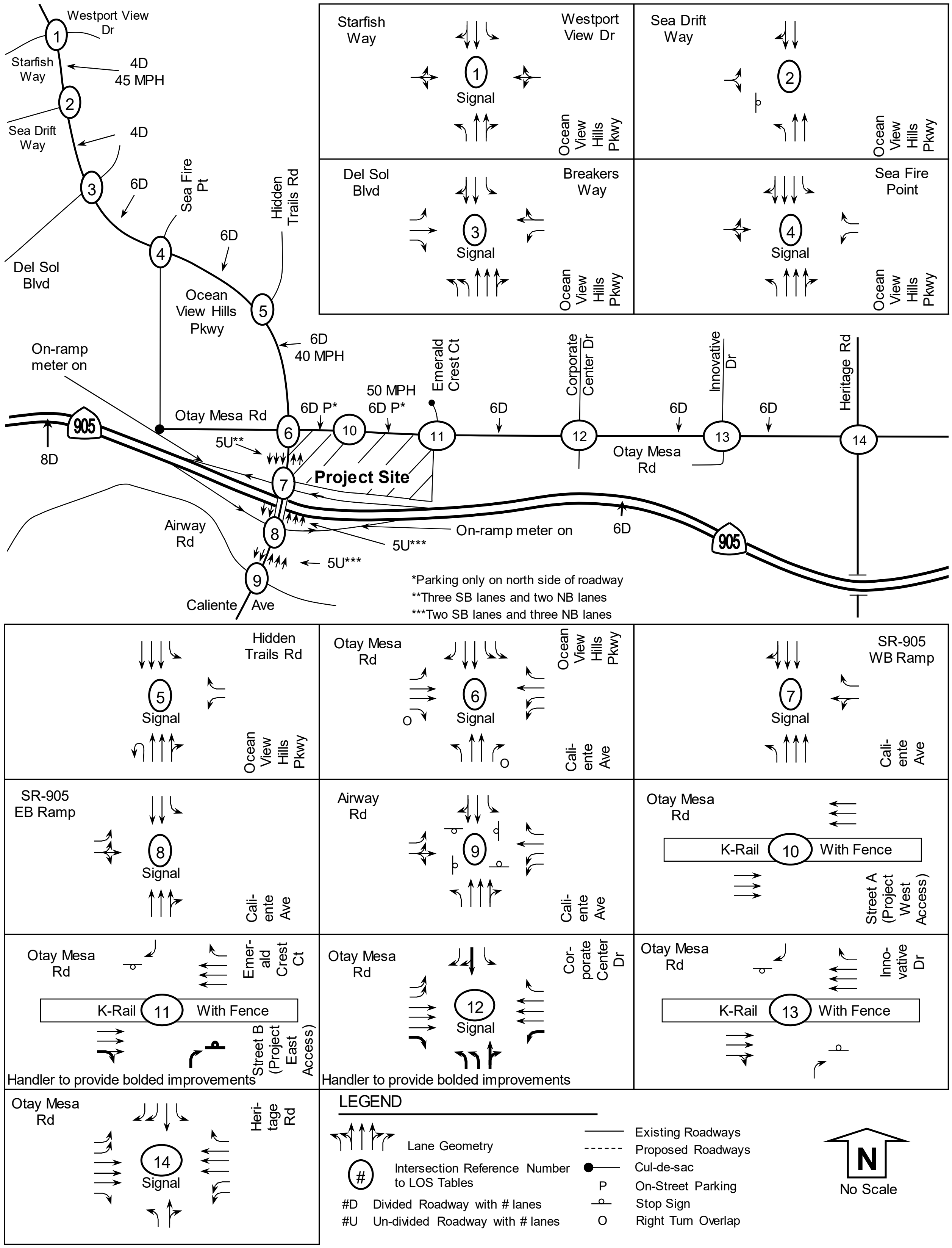


Figure 17: Horizon Year 2062 without Project Volumes

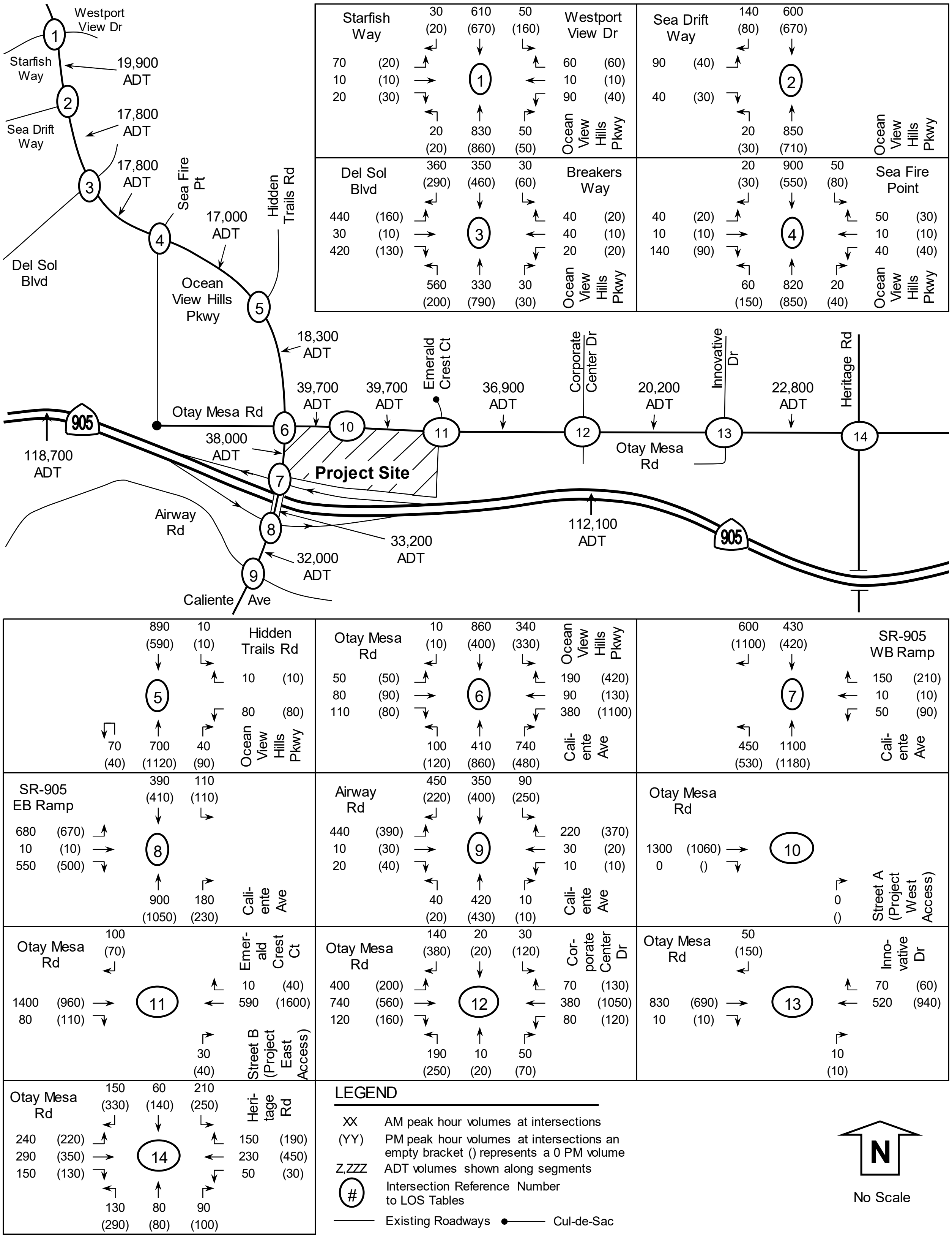


TABLE 26: HORIZON YEAR 2062 WITHOUT PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis)[1]	Movement	Study Period	Horizon Year 2062 Delay[2]	Horizon Year 2062 LOS[3]
1) Ocean View Hills Pkwy	All	AM	21.4	C
at Starfish/Westport (S)	All	PM	20.0	B
2) Ocean View Hills Pkwy	EB LR	AM	23.1	C
at Sea Drift Wy (U)	NB L	AM	9.6	A
	EB LR	PM	17.2	C
	NB L	PM	9.6	A
3) Ocean View Hills Pkwy	All	AM	49.7	D
at Del Sol/Breakers (S)	All	PM	24.4	C
4) Ocean View Hills Pkwy	All	AM	19.2	B
at Sea Fire Pt (S)	All	PM	18.2	B
5) Ocean View Hills Pkwy	All	AM	5.1	A
at Hidden Trails Rd (S)	All	PM	5.9	A
6) Ocean View Hills Pkwy	All	AM	34.8	C
at Caliente/Otay Mesa (S)	All	PM	51.8	D
7) Caliente Ave at	All	AM	28.7	C
SR-905 WB Ramp (S)	All	PM	**180.7**	**F**
8) Caliente Ave at	All	AM	36.2	D
SR-905 EB Ramp (S)	All	PM	34.9	C
9) Caliente Ave at	All	AM	**124.8**	**F**
Airway Rd (U)	All	PM	**90.2**	**F**
10) Otay Mesa Rd at	NB R	AM	DNE	NA
Project West Access (U)	NB R	PM	DNE	NA
11) Otay Mesa Rd at	NB R	AM	19.6	C
Emerald Crest Ct (U)	NB R	PM	14.1	B
12) Otay Mesa Rd at	All	AM	45.3	D
Corporate Center Rd (S)	All	PM	34.9	C
13) Otay Mesa Rd at	NB R	AM	12.8	B
Innovative Dr (U)	SB R	AM	11.5	B
	NB R	PM	11.9	B
	SB R	PM	17.5	C
14) Otay Mesa Rd at	All	AM	33.6	C
Heritage Rd (S)	All	PM	37.1	D

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. DNE: Does Not Exist. NA: Not Applicable. Bold indicates unacceptable LOS. Note: Intersections 11 and 13 are right-in, right-out only.

Please note that the reported LOS F intersection delay is excessive and may be beyond the range of reliability; however, the standard of practice HCM based software is being used.

TABLE 27: HORIZON YEAR 2062 WITHOUT PROJECT SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Segment	Classification: Ultimate and (Functional)	LOS E Capacity	Horizon Year 2062 Daily Volume	V/C	LOS
Caliente Avenue					
Otay Mesa Rd to SR-905 WB Ramp	6P (5C)	35,000	38,000	1.086	**F**
SR-905 EB Ramp to SR-905 EB Ramp	6P (5C)	35,000	33,200	0.949	**E**
SR-905 EB Ramp to Airway Rd	6P (5C)	35,000	32,000	0.914	**E**
Ocean View Hills Parkway					
Starfish Way/Westport View to Sea Drift Way	4M (4M)	40,000	19,900	0.498	B
Sea Drift Way to Del Sol Blvd	4M (4M)	40,000	17,800	0.445	B
Del Sol Blvd to Sea Fire Pt	6M (6M)	50,000	17,800	0.356	A
Sea Fire Pt to Hidden Trails Rd	6M (6M)	50,000	17,000	0.340	A
Hidden Trails Rd to Otay Mesa Rd	6M (6M)	50,000	18,300	0.366	A
Otay Mesa Road					
Ocean View Hills Pkwy to Proj. W. Access	6P (6P)	60,000	39,700	0.662	C
Proj. W. Access to Emerald Crest Ct	6P (6P)	60,000	39,700	0.662	C
Emerald Crest Ct to Corporate Center Dr	6P (6P)	60,000	36,900	0.615	C
Corporate Center Dr to Innovative Dr	6P (6P)	60,000	20,200	0.337	A
Innovative Dr to Heritage Rd	6P (6P)	60,000	22,800	0.380	A

Notes: 6P=6 lane Prime, 6M = 6 lane Major, 5M=5 lane Major, 5C=5 lane Collector, 4M=4 lane Major. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio. Bold indicates unacceptable LOS.

TABLE 28: HORIZON YEAR 2062 WITHOUT PROJECT FREEWAY VOLUMES AND LEVEL OF SERVICE

State Route	SR-905				SR-905			
Segment	I-805 to Caliente Ave				Caliente Ave to Britannia Blvd			
Horizon Year (2062 Forecast)								
ADT	118,700				112,100			
Peak Hour	A M		P M		A M		P M	
Direction	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	4	4	4	4	3	3	3	3
Capacity (1)	9,400	9,400	9,400	9,400	7,050	7,050	7,050	7,050
K Factor (2)	0.0761	0.0761	0.0902	0.0902	0.0761	0.0761	0.0902	0.0902
D Factor (3)	0.6624	0.3376	0.4124	0.5876	0.6624	0.3376	0.4124	0.5876
Truck Factor (4)	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811
Peak Hour Volume	6,791	3,461	5,011	7,140	6,413	3,269	4,733	6,743
Volume to Capacity	0.722	0.368	0.533	0.760	0.910	0.464	0.671	0.956
Horizon Year LOS	D	B	C	D	**E**	B	C	**E**

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) K factor from Caltrans, which is the percentage of AADT in both directions. (3) D factor from Caltrans, which when multiplied by K and ADT will provide peak hour volume. (4) Truck factor from Caltrans. Excel rounding may result in ±1 above. Bold indicates unacceptable LOS.

TABLE 29: HORIZON YEAR 2062 WITHOUT PROJECT FREEWAY ON-RAMP OPERATIONS

SR-905 at Caliente Ave On Ramp & Peak Period	Scenario	Vehicle Demand for 2 lanes (veh/hr)	Vehicle Demand per lane (veh/hr)*	Most Restrictive Rate per lane (1)	Excess Demand per lane (veh/hr)	Calculated Delay per lane (minutes)	Calculated Queue in Feet per lane (2)
AM WB	Horizon Yr	1,060	530	480	50	6.3	1,250
PM WB	Horizon Yr	1,640	820	480	340	42.5	8,500
AM EB	Horizon Yr	300	150	480	0	0.0	0
PM EB	Horizon Yr	350	175	480	0	0.0	0

Notes: *Two lanes. (1) Rate from Otay Mesa Community Plan Update EIR of 960 for total ramp, thus 480 by lane. (2) Calculated queue may be different than actual queue in the horizon year because it is unknown if Caltrans may apply a different rate in year 2062.

Under Horizon Year 2062 without project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for:

1) Intersection of Caliente Avenue at SR-905 WB Ramp (LOS F PM),
2) Intersection of Caliente Avenue at Airway Road (LOS F AM & PM),
3) Segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp (LOS F),
4) Segment of Caliente Ave between SR-905 WB Ramp and SR-905 EB Ramp (LOS E),
5) Segment of Caliente Ave between SR-905 EB Ramp and Airway Rd (LOS E), and
6) SR-905 between Caliente Ave and Britannia Blvd (LOS E AM EB & PM WB).

The metered freeway on-ramps were calculated to operate with significant delays (WB AM 10 minutes & WB PM 47.5 minutes, which exceeds acceptable operations. The receiving WB segment of SR-905 between I-805 and Caliente Ave is calculated to operate at acceptable LOS B AM and LOS D PM) or no delay (EB AM & PM). Please note that the reported WB on-ramp delay is excessive and may be beyond the range of reliability; however, the standard of practice calculation was used.

9.0 Horizon Year 2062 with Project Conditions

The Horizon Year 2062 with the project conditions were analyzed by adding the project traffic onto Horizon Year 2062 volumes. Horizon year 2062 with project conditions used in the LOS calculations are shown in **Figure 18**. The Horizon Year 2062 volumes with project traffic are shown in **Figure 19.** LOS and ramp meter operations are shown in **Tables 30 through 32** with calculations included in **Appendix X**.

TABLE 30: HORIZON YEAR 2062 WITH PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and	Movement	Study	Horizon Year		Horizon Year 2062 + Project			
(Analysis)[1]		Period	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	Impact?[5]
1) Ocean View Hills Pkwy	All	AM	21.4	C	22.3	C	0.9	No
at Starfish/Westport (S)	All	PM	20.0	B	21.5	C	1.5	No
2) Ocean View Hills Pkwy	EB LR	AM	23.1	C	24.0	C	0.9	No
at Sea Drift Wy (U)	NB L	AM	9.6	A	9.7	A	0.1	No
	EB LR	PM	17.2	C	17.9	C	0.7	No
	NB L	PM	9.6	A	9.8	A	0.2	No
3) Ocean View Hills Pkwy	All	AM	49.7	D	51.6	D	1.9	No
at Del Sol/Breakers (S)	All	PM	24.4	C	25.7	C	1.3	No
4) Ocean View Hills Pkwy	All	AM	19.2	B	19.3	B	0.1	No
at Sea Fire Pt (S)	All	PM	18.2	B	23.2	C	5.0	No
5) Ocean View Hills Pkwy	All	AM	5.1	A	5.2	A	0.1	No
at Hidden Trails Rd (S)	All	PM	5.9	A	6.2	A	0.3	No
6) Ocean View Hills Pkwy	All	AM	34.8	C	49.4	D	14.6	No
at Caliente/Otay Mesa (S)	All	PM	51.8	D	**68.4**	**E**	**16.6**	**Yes**
7) Caliente Ave at	All	AM	28.7	C	31.3	C	2.6	No
SR-905 WB Ramp (S)	All	PM	**180.7**	**F**	**195.4**	**F**	**14.7**	**Yes**
8) Caliente Ave at	All	AM	36.2	D	37.9	D	1.7	No
SR-905 EB Ramp (S)	All	PM	34.9	C	38.7	D	3.8	No
9) Caliente Ave at	All	AM	**124.8**	**F**	**128.3**	**F**	**3.5**	**Yes**
Airway Rd (U)	All	PM	**90.2**	**F**	**93.7**	**F**	**3.5**	**Yes**
10) Otay Mesa Rd at	NB R	AM	DNE	NA	21.1	C	NA	No
Project West Access (U)	NB R	PM	DNE	NA	20.6	C	NA	No
11) Otay Mesa Rd at	NB R	AM	19.6	C	22.4	C	22.4	No
Emerald Crest Ct (U)	NB R	PM	14.1	B	**>900**	**F**	**>900**	**Yes**
12) Otay Mesa Rd at	All	AM	45.3	D	46.4	D	1.1	No
Corporate Center Rd (S)	All	PM	34.9	C	37.5	D	2.6	No
13) Otay Mesa Rd at	NB R	AM	12.8	B	13.0	B	0.2	No
Innovative Dr (U)	SB R	AM	11.5	B	11.6	B	0.1	No
	NB R	PM	11.9	B	12.1	B	0.2	No
	SB R	PM	17.5	C	18.3	C	0.8	No
14) Otay Mesa Rd at	All	AM	33.6	C	33.7	C	0.1	No
Heritage Rd (S)	All	PM	37.1	D	37.5	D	0.4	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Impact if project traffic exceeds threshold. DNE: Does not exist. NA: Not Applicable. Bold indicates unacceptable LOS and/or impact. Note: Intersections 11 and 13 are right-in, right-out only.

Please note that the reported LOS F intersection delay is excessive and may be beyond the range of reliability; however, the standard of practice HCM based software is being used.

Figure 18: Horizon Year 2062 with Project Conditions

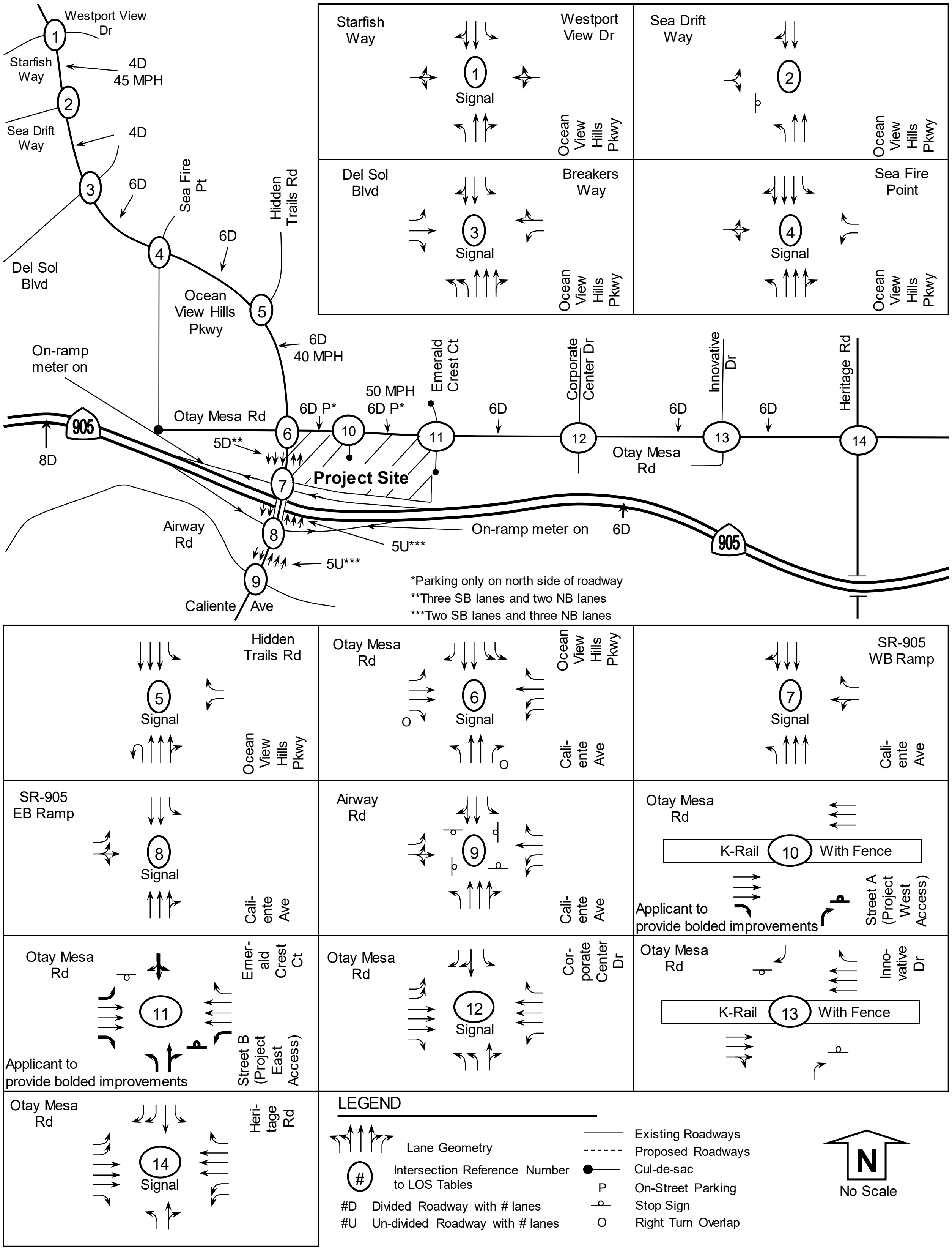


Figure 19: Horizon Year 2062 with Project Volumes

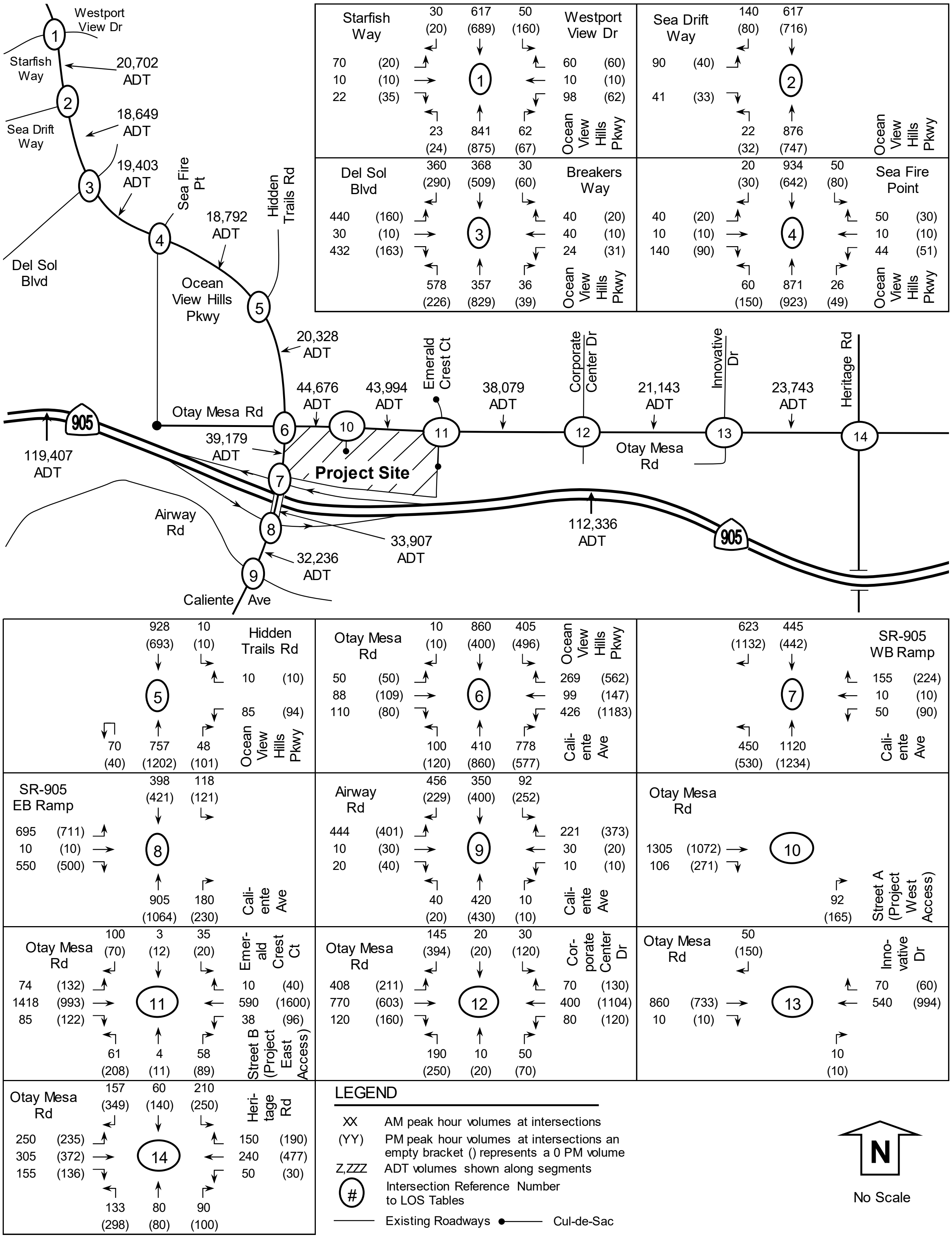


TABLE 31: HORIZON YEAR 2062 WITH PROJECT SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Segment	Classification: Ultimate and (Functional)	LOS E Capacity	Horizon Year 2062 Daily Volume	Horizon Year 2062 V/C	Horizon Year 2062 LOS	Project Daily Volume	Horizon Year 2062 + Project Daily Volume	Horizon Year 2062 + Project V/C	Horizon Year 2062 + Project LOS	Change In V/C	Cumulative Impact?
Caliente Avenue											
Otay Mesa Rd to SR-905 WB Ramp	6P (5C)	35,000	38,000	1.086	**F**	1,179	39,179	1.119	**F**	0.034	**Yes**
SR-905 EB Ramp to SR-905 EB Ramp	6P (5C)	35,000	33,200	0.949	**E**	707	33,907	0.969	**E**	0.020	No
SR-905 EB Ramp to Airway Rd	6P (5C)	35,000	32,000	0.914	**E**	236	32,236	0.921	**E**	0.007	No
Ocean View Hills Parkway											
Starfish Way/Westport View to Sea Drift Way	4M (4M)	40,000	19,900	0.498	B	802	20,702	0.518	B	0.020	No
Sea Drift Way to Del Sol Blvd	4M (4M)	40,000	17,800	0.445	B	849	18,649	0.466	B	0.021	No
Del Sol Blvd to Sea Fire Pt	6M (6M)	50,000	17,800	0.356	A	1,603	19,403	0.388	A	0.032	No
Sea Fire Pt to Hidden Trails Rd	6M (6M)	50,000	17,000	0.340	A	1,792	18,792	0.376	A	0.036	No
Hidden Trails Rd to Otay Mesa Rd	6M (6M)	50,000	18,300	0.366	A	2,028	20,328	0.407	B	0.041	No
Otay Mesa Road											
Ocean View Hills Pkwy to Proj. W. Access	6P (6P)	60,000	39,700	0.662	C	4,976	44,676	0.745	C	0.083	No
Proj. W. Access to Emerald Crest Ct	6P (6P)	60,000	39,700	0.662	C	4,294	43,994	0.733	C	0.072	No
Emerald Crest Ct to Corporate Center Dr	6P (6P)	60,000	36,900	0.615	C	1,179	38,079	0.635	C	0.020	No
Corporate Center Dr to Innovative Dr	6P (6P)	60,000	20,200	0.337	A	943	21,143	0.352	A	0.016	No
Innovative Dr to Heritage Rd	6P (6P)	60,000	22,800	0.380	A	943	23,743	0.396	A	0.016	No

Notes: 6P=6 lane Prime, 6M = 6 lane Major, 5M=5 lane Major, 5C=5 lane Collector, 4M=4 lane Major. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio. Bold indicates unacceptable LOS and/or impact.

TABLE 32: HORIZON YEAR 2062 WITH PROJECT FREEWAY VOLUMES AND LEVEL OF SERVICE

State Route	SR-905				SR-905			
Segment	I-805 to Caliente Ave				Caliente Ave to Britannia Blvd			
Horizon Year (2062 Forecast)								
ADT	118,700				112,100			
Peak Hour	A M		P M		A M		P M	
Direction	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	4	4	4	4	3	3	3	3
Capacity (1)	9,400	9,400	9,400	9,400	7,050	7,050	7,050	7,050
K Factor (2)	0.0761	0.0761	0.0902	0.0902	0.0761	0.0761	0.0902	0.0902
D Factor (3)	0.6624	0.3376	0.4124	0.5876	0.6624	0.3376	0.4124	0.5876
Truck Factor (4)	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811	0.8811
Peak Hour Volume	6,791	3,461	5,011	7,140	6,413	3,269	4,733	6,743
Volume to Capacity	0.722	0.368	0.533	0.760	0.910	0.464	0.671	0.956
Horizon Year LOS	D	B	C	D	**E**	B	C	**E**
Project Pk Hr Vol	15	23	41	32	8	5	11	14
SANDAG (Horizon Year + Project)								
Peak Hour Volume	6,806	3,484	5,052	7,172	6,421	3,274	4,744	6,757
Volume to Capacity	0.724	0.371	0.537	0.763	0.911	0.464	0.673	0.958
LOS	D	B	C	D	**E**	B	C	**E**
Increase in V/C	0.002	0.002	0.004	0.003	0.001	0.001	0.002	0.002
Project Impact?	No	No	No	No	No	No	No	No

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) K factor from Caltrans, which is the percentage of AADT in both directions. (3) D factor from Caltrans, which when multiplied by K and ADT will provide peak hour volume. (4) Truck factor from Caltrans. Excel rounding may result in ±1 above. Bold indicates unacceptable LOS.

TABLE 33: HORIZON YEAR 2062 WITH PROJECT FREEWAY ON-RAMP OPERATIONS

SR-905 at Caliente Ave On Ramp & Peak Period	Scenario	Vehicle Demand (veh/hr)	Vehicle Demand per lane (veh/hr)*	Most Restrictive Rate per lane (1)	Excess Demand per lane (veh/hr)	Calculated Delay per lane (minutes)	Calculated Queue in Feet per lane (2)	Cumula-tive Impact? (3)
AM WB	Horizon Yr	1,060	530	480	50	6.3	1,250	
On-Ramp	Horizon Yr + P	1,083	542	480	62	7.7	1,538	
		Increase in delay due to project traffic per lane:				1.4	288	No
PM WB	Horizon Yr	1,640	820	480	340	42.5	8,500	
On-Ramp	Horizon Yr + P	1,672	836	480	356	44.5	8,900	
		Increase in delay due to project traffic per lane:				2.0	400	No
AM EB	Horizon Yr	300	150	480	0	0.0	0	
On-Ramp	Horizon Yr + P	308	154	480	0	0.0	0	
		Increase in delay due to project traffic per lane:				0.0	0	No
PM EB	Horizon Yr	350	175	480	0	0.0	0	
On-Ramp	Horizon Yr + P	361	181	480	0	0.0	0	
		Increase in delay due to project traffic per lane:				0.0	0	No

Notes: *Two lanes. (1) Rate from Otay Mesa Community Plan Update EIR of 960 for total ramp, thus 480 by lane. (2) Calculated queue may be different than actual queue in the horizon year because it is unknown if Caltrans may apply a different rate in year 2062. (3) Not considered a cumulative impact becuase downstream freeway operations are at LOS D or better.

Under horizon year 2062 with project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for:

1) Intersection of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave (LOS E PM),
2) Intersection of Caliente Avenue/SR-905 WB Ramp (LOS F PM),
3) Intersection of Caliente Avenue at Airway Road (LOS F AM & PM),
4) Intersection of Otay Mesa Road at Emerald Crest Court (LOS F PM),
5) Segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp (LOS F),
6) Segment of Caliente Ave between SR-905 WB Ramp and SR-905 EB Ramp (LOS E),
7) Segment of Caliente Ave between SR-905 EB Ramp and Airway Rd (LOS E), and
8) SR-905 between Caliente Ave and Britannia Blvd (LOS E AM EB & PM WB).

The project is calculated to have five cumulative (horizon year) impacts at

1) Intersection of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave (LOS E PM),
2) Intersection of Caliente Avenue/SR-905 WB Ramp (LOS F PM),
3) Intersection of Caliente Avenue at Airway Road (LOS F AM & PM),
4) Intersection of Otay Mesa Road at Emerald Crest Court (LOS F PM), and
5) Segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp (LOS F).

The two other segments of Caliente Avenue with unacceptable LOS (SR-905 WB Ramp to SR-905 EB Ramp and SR-905 EB Ramp to Airway Rd) do not have cumulative impacts because the project traffic does not exceed the City of San Diego traffic impact significance thresholds.

The following metered freeway on-ramps were calculated to operate with significant delays:

1) WB SR-905 On-Ramp AM (7.7 minutes per lane)
2) WB SR-905 On-Ramp PM (44.5 minutes per lane)

The above on-ramp meter delay exceeds acceptable operations; however, the project does not result in a significant impact to the metered on-ramps because the downstream freeway operations are expected to be at LOS D or better. The Otay Mesa CPU EIR also documented delays in excess of 15 minutes at the Caliente Avenue WB on-ramp in conjunction with downstream freeway operations of unacceptable LOS E or F conditions (Appendix P). Please note that the reported WB on-ramp delay is excessive and may be beyond the range of reliability; however, the standard of practice calculation was used.

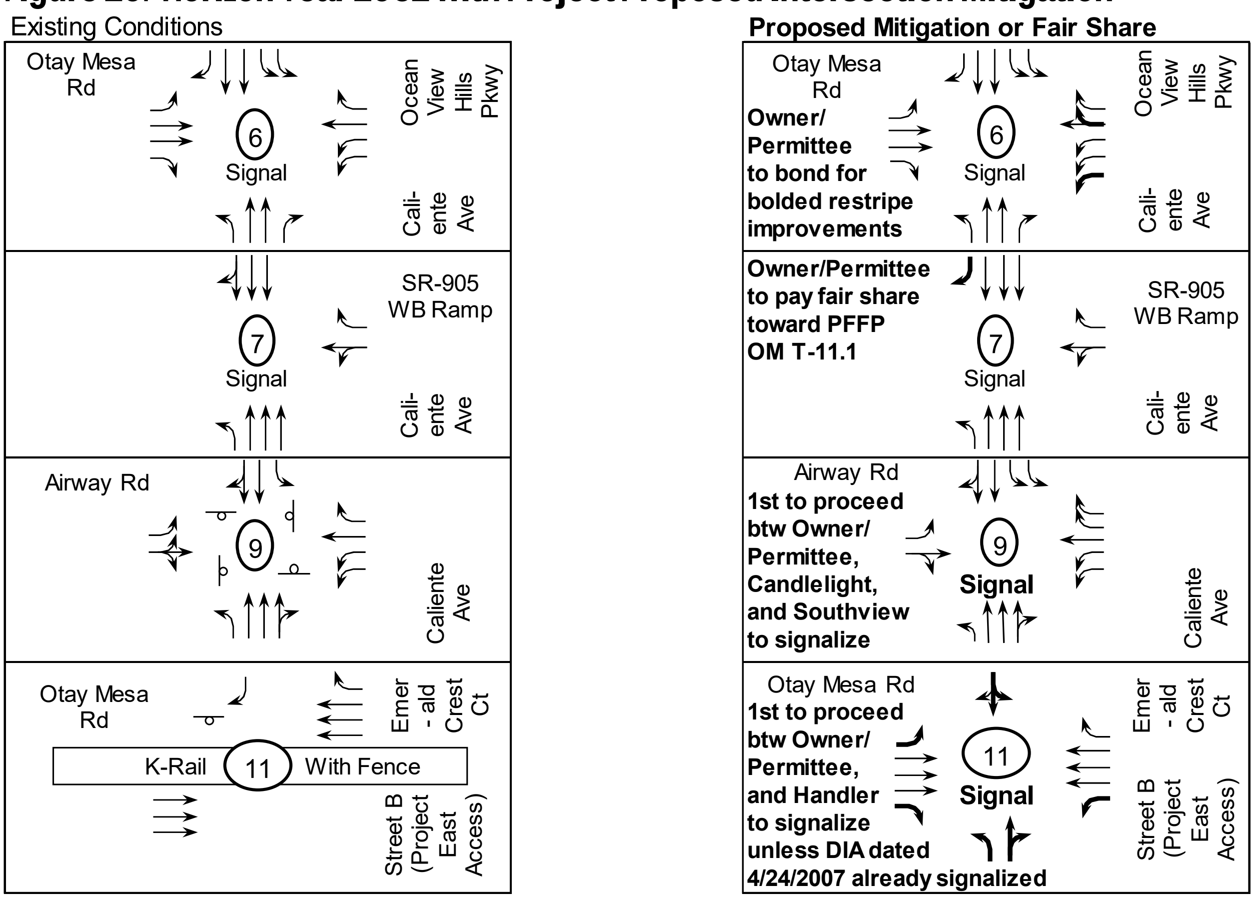
9.1 Horizon Year 2062 with Project Proposed Mitigation

The project is calculated to have five (5) cumulative impacts at the following locations.

1) Intersection of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave (LOS E PM),
2) Intersection of Caliente Avenue/SR-905 WB Ramp (LOS F PM),
3) Intersection of Caliente Avenue/Airway Road (LOS F AM & PM),
4) Intersection of Otay Mesa Road/Emerald Crest Court (LOS F PM), and
5) Segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp (LOS F).

The applicant is proposing the following intersection mitigation measures as shown in **Figure 20**.

Figure 20: Horizon Year 2062 with Project Proposed Intersection Mitigation



The proposed mitigation measures are calculated to improve the intersection operations to below a level of significance as shown in **Table 34.** LOS calculation and a concept striping plan for the intersection of Caliente Ave/Otay Mesa Rd/Ocean View Hills Pkwy are included in **Appendix Y**.

TABLE 34: HORIZON YEAR 2062 WITH PROJECT OPERATIONS WITH PROPOSED MITIGATION

Intersection &	Move-	Study	Horizon Year		Horizon Year + Project				Hor. Yr + Proj (with MIT)			
(Analysis)[1]	ment	Period	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	Sig[5]	Delay[2]	LOS[3]	Delta[6]	Sig[5]
6) Ocean View Hills Pkwy	All	AM	34.8	C	49.4	D	14.6	No	39.6	D	4.8	No
at Caliente/Otay Mesa (S)	All	PM	51.8	D	**68.4**	**E**	**16.6**	**Yes**	47.8	D	-4.0	No
							Mitigation:		**Restripe to add lanes**			
7) Caliente Ave at	All	AM	28.7	C	31.3	C	2.6	No	28.5	C	-0.2	No
SR-905 WB Ramp (S)	All	PM	**180.7**	**F**	**195.4**	**F**	**14.7**	**Yes**	**178.5**	**F**	-2.2	No
							Mitigation:		**8.8% fair share to PFFP T-11.1 (SB RT Lane)**			
9) Caliente Ave at	All	AM	**124.8**	**F**	**128.3**	**F**	**3.5**	**Yes**	25.0	C	-99.8	No
Airway Rd (U)	All	PM	**90.2**	**F**	**93.7**	**F**	**3.5**	**Yes**	26.6	C	-63.6	No
							Mitigation:		**1st to proceed between Owner/Permittee, Candlelight, & Southview to signalize**			
11) Otay Mesa Rd at	NB	AM	19.6	C	22.4	C	22.4	No	15.0	C	-4.6	No
Emerald Crest Ct (U)	NB	PM	14.1	B	**>900**	**F**	**>900**	**Yes**	22.6	C	8.5	No
							Mitigation:		**1st to proceed between Owner/Permittee, Handler, and DIA to signalize**			

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Direct Impact if project traffic exceeds threshold. 6) Delta is between Horizon Year (no project, no mitigation) and Horizon Year with project with mitigation.

The intersection of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave is identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout resulting in the adoption of overriding considerations. The applicant is proposing mitigation to reduce the significant direct and cumulative impact at this intersection to below significant through a restriping of the westbound approach from four approach lanes (left, left, through, right) to five approach lanes (left, left, left, through-right, right) satisfactory to the City Engineer (as shown previously in Figure 20). However, if the restripe is determined to be infeasible, then the impact at would not be fully mitigated and a Statement of Overriding Considerations would be required, which is consistent with the Otay Mesa CPU EIR.

The intersection of Caliente Ave/SR-905 WB Ramp is identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout. Prior to issuance of the first building permit, owner/permittee shall make a fair share contribution of 8.8% toward PFFP OM T-11.1 that includes the construction of an additional southbound right turn lane satisfactory to the City Engineer. However, if the PFFP is not fully funded by Horizon Year, then the impact would not be mitigated consistent with the Otay Mesa CPU EIR.. Fair share calculations of 6.5% AM and 8.8% PM are included in **Appendix Z**. The intersection of Caliente Ave/Airway Rd is also identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout. The project proposes mitigation for reduction of its direct and cumulative impact through the installation of signal at this intersection. This intersection is also identified to be signalized as part of the Candlelight VTM MMRP and Southview. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.

The intersection of Otay Mesa Rd/Emerald Crest Court/Street B with full turning movements allowed requires a traffic signal to reduce the Project's direct impact to below a level of significance. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational. The signal could be completed by either the adjacent Handler commercial project or by Garden Communities as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007 and secured by a bond of $162,000.

The cumulative segment impact on Caliente Avenue would be reduced to below a level of significance through the project's construction of a full width raised median along the project frontage. Prior to issuance of the first building permit, owner/permittee shall construct a full width raised median on Caliente Avenue from Otay Mesa Rd to SR-905 WB Ramp. The LOS with the raised median is shown in **Table 35**.

TABLE 35: HORIZON YEAR 2062 WITH PROJECT CALIENTE AVE OPERATIONS

Segment	Classification: Ultimate and (Functional)	LOS E Capacity	Horizon Year 2062 Daily Volume	Horizon Year 2062 V/C	Horizon Year 2062 LOS	Project Daily Volume	Horizon Year 2062 + Project Daily Volume	Horizon Year 2062 + Project V/C	Horizon Year 2062 + Project LOS	Horizon Year 2062 + Project Change In V/C	Horizon Year 2062 + Project Cumulative Impact?
Caliente Avenue (with reduced lane usage of a 5 lane collector)											
Otay Mesa Rd to SR-905 WB Ramp	6P (5C)	35,000	38,000	1.09	**F**	1,179	39,179	1.12	**F**	0.03	**Yes**
Caliente Avenue (with project median, the reduced lane usage is a 5 lane major)											
Otay Mesa Rd to SR-905 WB Ramp	6P (5M)	45,000	38,000	0.84	D	1,179	39,179	0.87	D	0.03	No

Notes: 6P=6 lane Prime, 6M = 6 lane Major, 5C=5 lane Collector, 4M=4 lane Major. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio. Bold indicated unacceptable LOS and/or impact.

10.0 Project Impacts and Mitigation Summary

The project is calculated to have three direct significant impacts (intersections of Caliente Ave/SR-905 WB Ramp, Caliente Avenue/Airway Road, Otay Mesa Rd/Emerald Crest Ct/Street B) and five horizon year cumulative impacts (intersections of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave, Caliente Ave/SR-905 WB Ramp, Caliente Ave/Airway Rd, Otay Mesa Road/Emerald Crest Court, and the segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp). In addition to the proposed mitigation measures previously outlined, the applicant proposes the following project features:

1) Construct Street A to full width (public cul-de-sac extending south from Otay Mesa Rd) located approximately 500 feet east of Caliente Avenue (centerline to centerline) with right-in/right-out only access and a right turn deceleration lane on Otay Mesa Road (deceleration lane required to allow access from a primary arterial).

2) Construct Street B to full width (public cul-de-sac extending south from Otay Mesa Rd) located along the eastern project boundary that will align with Emerald Crest Court completing a fourth leg to this existing t-intersection along with a right turn deceleration lane on Otay Mesa Road.

3) Remove the existing K-Rail with fence along the project's frontage on Otay Mesa Road and replace with concrete raised median, along with signal installation at Otay Mesa Road / Emerald Crest Court/Street B. The intersection of Caliente Ave/Emerald Crest Court will be signalized by the first applicant to obtain building permits between this project and the adjacent Handler commercial project, unless it is completed beforehand as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007. Traffic signal warrant Figure 4C-103 based on estimated ADT is satisfied with calculations included in Appendix I.

4) Construct a full width raised median on Caliente Avenue from Otay Mesa Road to SR-905 WB Ramp, and

5) Construct a 6-foot non-contiguous sidewalk along the project frontage on Otay Mesa Road. Replace the existing sidewalk along the project frontage on Caliente Ave with a 6-ft non-contiguous sidewalk that will connect with the existing sidewalk at the Caltrans ROW.

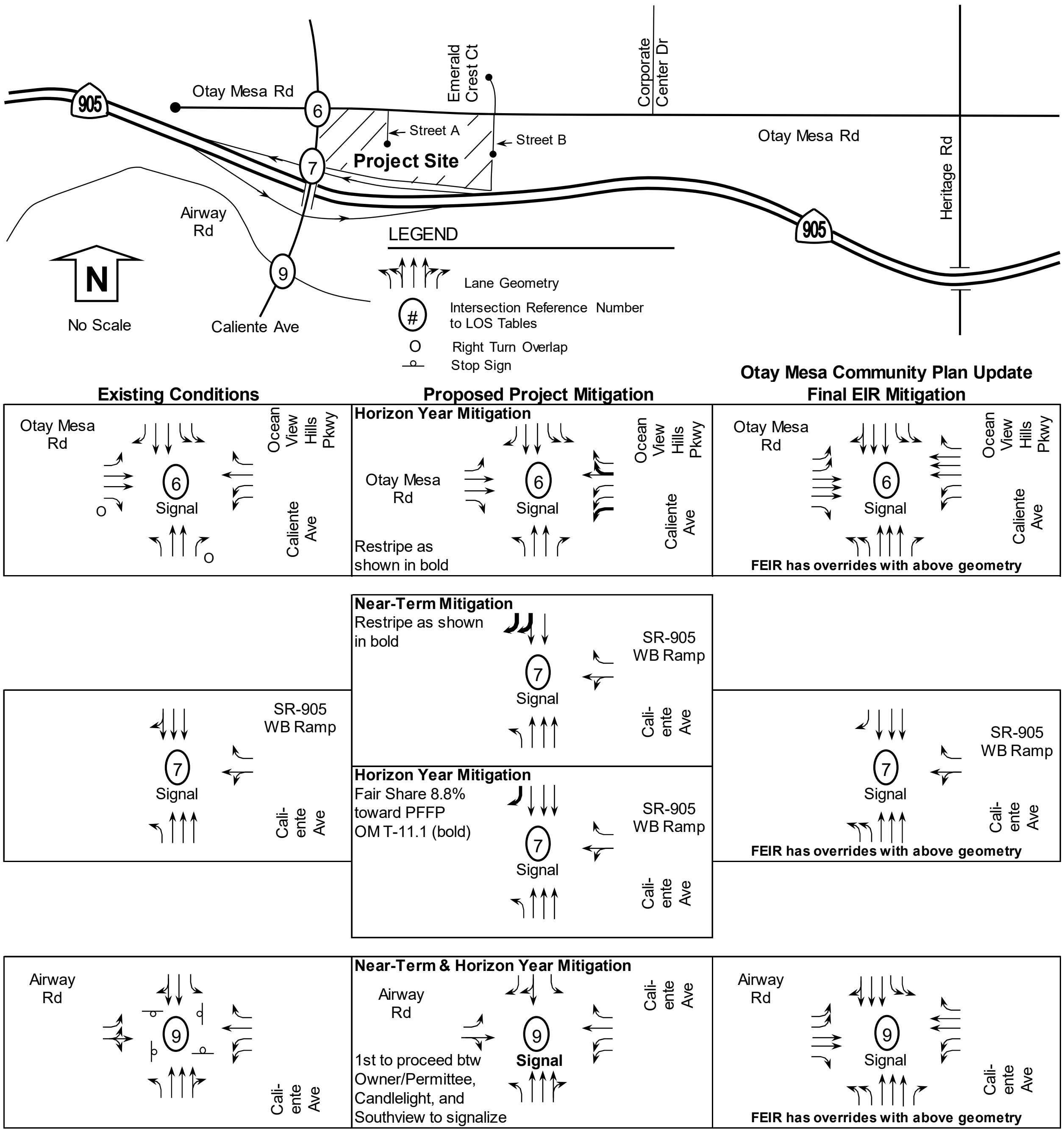
10.1 Mitigation Summary

Significant project impacts are anticipated at the intersections of Ocean View Hills Pkwy/Caliente Road/Otay Mesa Rd and Caliente Ave/SR-905 WB Ramp. These intersections are also identified in the Otay Mesa Community Plan Update (CPU) Final EIR as being expected to operate at unacceptable levels of service in the Horizon Year plus Community Plan Update FEIR. with improvements beyond the mitigation measures proposed by the project applicant, as shown in **Figure 21** (excerpts from the FEIR are included in Appendix N). The mitigation summary is shown in **Table 36.**

TABLE 36: DIRECT AND CUMULATIVE IMPACT SUMMARY AND PROPOSED MITIGATION

Roadway Facility	Existing AND Near Term Year 2020 + Project Direct Impacts	Mitigation
Intersections	1) Caliente Ave/SR-905 WB Ramp	Prior to issuance of the first building permit, owner/permittee shall restripe the southbound approach to include a through lane, a through-right turn lane, and right turn lane satisfactory to the City Engineer and Caltrans.
	2) Caliente Ave/Airway Rd	Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.
	3) Otay Mesa Rd/Emerald Crest Ct	Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.
Segments	None	None
Freeways	None	None
On-Ramps	Not Metered	Not Applicable
Roadway Facility	**Horizon Year 2062 + Project Cumulative Impacts**	**Mitigation**
Intersections	1) Otay Mesa Rd/Ocean View Hills/Caliente Ave	Prior to issuance of the first building permit, owner/permittee shall bond for the restriping of the westbound approach to three left turn lanes, a through-right turn lane, and an exclusive right turn lane satisfactory to the City Engineer. However, if not implemented by Horizon Year, then the impact would not be mitigated consistent with the Otay Mesa CPU EIR.
	2) Caliente Ave/SR-905 WB Ramp	Prior to issuance of the first building permit, owner/permittee shall make a fair share contribution of 8.8% toward PFFP OM T-11.1 that includes the construction of an additional southbound right turn lane satisfactory to the City Engineer. However, if the PFFP not fully funded by Horizon Year, then the impact would not be mitigated consistent with the Otay Mesa CPU EIR.
	3) Caliente Ave/Airway Rd	Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.
	4) Otay Mesa Rd/Emerald Crest Ct	Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.
Segments	1)Caliente Ave from Otay Mesa to SR-905 WB Ramp	Prior to issuance of the first building permit, owner/permittee shall construct a full width raised median on Caliente Avenue from Otay Mesa Rd to SR-905 WB Ramp.
Freeways	None	None
On-Ramps	None	None

Figure 21: Proposed and Otay Mesa CPU FEIR Mitigation Measures



11.0 Parking

The project of 171 dwelling units requires a minimum of 545 automobile spaces while 605 automobile spaces would be provided based on 45,000 sf Commercial and 171 dwelling units. The number of bedrooms by unit for the 267 unit scenario is not available, thus the parking requirement cannot be calculated; however, when submitted as part of the Substantial Conformance Review, the parking details will be provided. There are no Land Development Code deviations anticipated with the 267 unit scenario. The parking summary in **Table 37** would be updated when the project dwelling unit count is refined.

TABLE 37: PROJECT PARKING SUMMARY

Project Component	Minimum Required Parking by Code	Provided Parking
Commercial (45,000 sf) (Munipal Code Table 142.05E, 4.3 spaces per 1,000 sf in Transit Priority Area)	194 Automobile Spaces 4 Motorcycle Spaces 10 Short Term Bicycle Spaces 10 Long Term Bicycle Spaces	194 Automobile Spaces 4 Motorcycle Spaces 12 Short Term Bicycle Spaces 12 Long Term Bicycle Spaces
Residential (171 units) 92 three-bedroom units 79 four-bedroom units (Municipal Code Table 142-05C, 2 spaces per unit in transit area)	342 Automobile Spaces 9 Accessible Spaces 18 Motorcycle Spaces Bicycle spaces not required for dwelling units with enclosed garages	401 Automobile Spaces (Including 59 Open Spaces) 10 Accessible Spaces 20 Motorcycle Spaces 0 Bicycle Spaces
Total Automobile Spaces	545	605

12.0 Transportation Demand Management

A Transportation Demand Management (TDM) plan will provide the means to disseminate information to help tenants and employees learn about and use alternative forms of transportation other than single occupancy vehicles. The following TDM elements (to be implemented by the property owner/manager) will be provided for this mixed-use project that will be incorporated into the project conditions of approval.

1) Provide information about the SANDAG's iCommute program (www.icommutesd.com),

2) Provide showers and lockers for employees of the commercial uses,

3) Encourage carpooling for employees of the retail through incentives such as through providing carpool spaces at premium locations in the parking area,

4) Encourage bike and transit usage for employees of the commercial project owner through incentives of partial subsidization of transit passes,

5) Display maps, routes, and schedules for public transit near the retail buildings in a kiosk, and

6) Provide more than the minimum required short term bicycle parking.

13.0 On-Site Vehicular and Pedestrian Circulation

The project has two distinct parts, a commercial center on the western side of the overall site and a residential area on the eastern side. There is a driveway across the residential portion that provides vehicular access between Street A and Street B.

The applicant will construct a 6-foot non-contiguous sidewalk along the project frontage on Otay Mesa Road, remove and replace the sidewalk along the project frontage on Caliente Avenue with a 6-foot non-contiguous sidewalk to connect with the contiguous sidewalk at Caltrans' ROW, and construct 6-foot non-contiguous sidewalks throughout cul-de-sac Street A and Street B. Several connections will be provided between the sidewalk and the residential side while the future commercial side will also incorporate connections between the commercial site and the sidewalk. The residential side has sidewalks and crosswalks for pedestrians to reach the on-site park and commercial site.

The project will connect with existing sidewalk on the east side of Caliente Avenue that extends in a southerly direction across SR-905. Pedestrians will have the choice of using existing sidewalks on the east or west side of Caliente Avenue to reach San Ysidro High School located on the southwest corner of Caliente Avenue and Airway Road.

14.0 Conclusions

The proposed California Terraces PA 61 is a mixed-use project with 171 to 267 multi-family units, up to 45,000 sf of commercial/retail space, and a 0.19 acre private park located on the southeast corner of Otay Mesa Road and Caliente Avenue in the Otay Mesa community of San Diego, California. The project is anticipated to open in year 2020. The site is currently vacant. The project requires a Community Plan Amendment (CPA) to re-designate the approximately 14-acre site from Community Commercial – Residential Prohibited (CC-2-3) to Community Commercial – Residential Permitted Rezone for the eastern portion of the property from CC-1-3 to RM-2-5, and to reclassify Caliente Avenue from Otay Mesa Road to SR-905 WB Ramp from a six-lane Prime to a five-lane Prime. The following discretionary approvals are required as part of the project:

1) Vesting Tentative Map
2) Site Development Permit
3) Master Planned Development Permit
4) Neighborhood Development Permit
5) Community Plan Amendment Land Use and Roadway Classification
6) Street Vacation and Rezone

The project's expected traffic generation was calculated using trip rates from the City of San Diego *Trip Generation Manual*, May 2003. Two trip generation rates were applied: a driveway rate for project access points and the intersection of Caliente Avenue/Otay Mesa Road and a cumulative rate (accounts for primary and diverted trips) that was applied for all other analyzed locations. The project driveway volumes (with 267 MF units, 45,000 sf commercial, and 0.19 acre park) were calculated at 6,816 ADT with 336 AM peak hour trips (152 inbound and 184 outbound) and 717 PM peak hour trips (387 inbound and 330 outbound). The cumulative traffic volumes were calculated at 4,716 ADT with 252 AM peak hour trips (101 inbound and 151 outbound) and 486 PM peak hour trips (271 inbound and 215 outbound).

As part of this transportation impact study, six scenarios were analyzed, which included Existing, Existing with Project, Near-term Year 2020 without Project, Near-term Year 2020 with Project (Opening Day), Horizon Year 2062 without Project, and Horizon Year 2062 with Project Conditions. Operational findings and project impacts by scenario are summarized below:

1) Under existing conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersection of Caliente Avenue at Airway Road (LOS F AM). The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

2) Under existing with project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersections of:
   i. Caliente Avenue at SR-905 WB Ramp (LOS E PM),
   ii. Caliente Avenue at Airway Road (LOS F AM), and
   iii. Otay Mesa Road at Emerald Crest Ct (LOS F PM).

   <u>The project is calculated to have direct impacts at all three of the above intersections</u>. The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

The intersection of Caliente Ave/SR-905 WB Ramp is identified in the Otay Mesa Community Plan Update (CPU) Final EIR as a significant and unmitigated impact at community buildout resulting in the adoption of overriding considerations. Under Existing Plus Project Conditions, the applicant is proposing mitigation to reduce the direct impact at this intersection to below significance through restriping the southbound approach of two through and one through-right turn lane (3 total approach lanes) to one through, one through-right, and one right turn lane (3 total approach lanes). The proposed restriping is an interim improvement until the City Public Facilities Financing Plan (PFFP) OM T-11.1 is completed (currently scheduled for 2026), which will add an additional southbound right turn lane from Caliente Ave to SR-905 WB Ramp resulting in 4 total approach lanes. The interim mitigation would reduce the significant impact at this intersection to less than significant. Prior to issuance of the first building permit, owner/permittee shall restripe the southbound approach to include a through lane, a through-right turn lane, and right turn lane satisfactory to the City Engineer and Caltrans.

The intersection of Caliente Ave/Airway Rd is also identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout resulting in the adoption of overriding considerations. The project proposes mitigation for reduction of this significant impact through the installation of signal at this intersection. It is noted that this intersection is also identified to be signalized as part of the Candlelight VTM Mitigation Monitoring and Reporting Program (MMRP). Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.

The intersection of Otay Mesa Rd/Emerald Crest Court/Street B with full turning movements allowed requires a traffic signal to reduce the direct impact to below a level of significance. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational. The signal could be completed by either the adjacent Handler commercial project or by others as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007 and secured by a $162,000 bond. The signal will be installed prior to the project's first occupancy in order to mitigate this project's direct impact.

Other project features include the construction of a full width raised median along the project frontage on Caliente Avenue, removal of the existing K-rail and replacement with a full width raised median along the project frontage on Otay Mesa Road, construction of two public cul-de-sac streets, construction of a 6-foot non-contiguous sidewalk along Otay Mesa Road, and replacement of the sidewalk along Caliente Ave with a 6-foot non-contiguous sidewalk along the project frontage.

3) Under Near Term 2020 (opening day) without project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersections of:
    i. Caliente Avenue at SR-905 WB Ramp (LOS E PM), and
    ii. Caliente Avenue at Airway Road (LOS F AM and PM).

   The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

4) Under Near Term 2020 (opening day) with project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for the intersections of:
   i. Caliente Avenue at SR-905 WB Ramp (LOS E PM),
   ii. Caliente Avenue at Airway Road (LOS F AM), and
   iii. Otay Mesa Road at Emerald Crest Ct (LOS F PM).

   <u>The project is calculated to have direct impacts at all three of the above intersections</u>. The Caliente Avenue/SR-905 on-ramps are not metered under this scenario.

   The intersection of Caliente Ave/SR-905 WB Ramp is identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout resulting in the adoption of overriding considerations. Under the Near Term, the applicant is proposing mitigation to reduce the direct impact at this intersection to below significance through restriping the southbound approach of two through and one through-right turn lane (3 total approach lanes) to one through, one through-right, and one right turn lane (3 total approach lanes). The proposed restriping is an interim improvement until the City Public Facilities Financing Plan (PFFP) OM T-11.1 is completed (currently scheduled for 2026), which will add an additional southbound right turn lane from Caliente Ave to SR-905 WB Ramp resulting in 4 total approach lanes. The interim mitigation would reduce the significant impact at this intersection to less than significant. Prior to issuance of the first building permit, owner/permittee shall restripe the southbound approach to include a through lane, a through-right turn lane, and right turn lane satisfactory to the City Engineer and Caltrans.

   The intersection of Caliente Ave/Airway Rd is also identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout resulting in the adoption of overriding considerations. The project proposes mitigation for reduction of this significant impact through the installation of signal at this intersection. It is noted that this intersection is also identified to be signalized as part of the Candlelight VTM Mitigation Monitoring and Reporting Program (MMRP). Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.

   The intersection of Otay Mesa Rd/Emerald Crest Court/Street B with full turning movements allowed requires a traffic signal to reduce the project's direct impact to below a level of significance. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational. The signal could be completed by either the adjacent Handler commercial project or by others as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007 and secured by a $162,000 bond. The signal will be installed prior to the project's first occupancy in order to mitigate this project's direct impact.

5) Under Horizon Year 2062 without project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for:
   i. Intersection of Caliente Avenue at SR-905 WB Ramp (LOS F PM),

ii. Intersection of Caliente Avenue at Airway Road (LOS F AM & PM),
iii. Segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp (LOS F),
iv. Segment of Caliente Ave between SR-905 WB Ramp and SR-905 EB Ramp (LOS E),
v. Segment of Caliente Ave between SR-905 EB Ramp and Airway Rd (LOS E), and
vi. SR-905 between Caliente Ave and Britannia Blvd (LOS E AM EB & PM WB).

The metered freeway on-ramps were calculated to operate with significant delays (WB AM 10 minutes & WB PM 47.5 minutes, which exceeds acceptable operations. The receiving WB segment of SR-905 between I-805 and Caliente Ave is calculated to operate at acceptable LOS B AM and LOS D PM) or no delay (EB AM & PM). Please note that the reported WB on-ramp delay is excessive and the calculation may be beyond the range of reliability; however, the standard of practice calculation was used.

6) Under Horizon Year 2062 with project conditions, the study intersections, street segments, and state route segments were calculated to operate at LOS D or better except for:
i. Intersection of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave (LOS E PM),
ii. Intersection of Caliente Avenue/SR-905 WB Ramp (LOS F PM),
iii. Segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp (LOS F),
iv. Segment of Caliente Ave between SR-905 WB Ramp and SR-905 EB Ramp (LOS E),
v. Segment of Caliente Ave between SR-905 EB Ramp and Airway Rd (LOS E), and
vi. SR-905 between Caliente Ave and Britannia Blvd (LOS E AM EB & PM WB).

The metered freeway on-ramp at SB SR-905/Caliente Avenue WB was calculated to operate with significant delays (11.9 minutes AM and 50.2 minutes PM); however, the project did not result in a significant impact to the metered on-ramps because the downstream freeway operations are expected to be at LOS D or better. The Otay Mesa CPU EIR also documented delays in excess of 15 minutes at the Caliente Avenue WB on-ramp in conjunction with downstream freeway operations of unacceptable LOS E or F conditions based on an analysis from 2012 that used older data. The reported WB on-ramp delay is excessive and may be beyond the range of reliability; however, the standard of practice calculation was used.

<u>The project is calculated to have five cumulative (horizon year) impacts at</u>
1) Intersection of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave (LOS E PM),
2) Intersection of Caliente Avenue/SR-905 WB Ramp (LOS F PM),
3) Intersection of Caliente Avenue at Airway Road (LOS F AM & PM),
4) Intersection of Otay Mesa Road at Emerald Crest Court (LOS F PM), and
5) Segment of Caliente Ave between Otay Mesa Rd and SR-905 WB Ramp (LOS F).

The two other segments of Caliente Avenue with unacceptable LOS (SR-905 WB Ramp to SR-905 EB Ramp and SR-905 EB Ramp to Airway Rd) do not have cumulative impacts because the project traffic does not exceed the City of San Diego traffic impact significance thresholds.

The intersection of Otay Mesa Rd/Ocean View Hills Pkwy/Caliente Ave is identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout. This impact was found to remain significant and unmitigated and a Statement of Overriding Considerations was adopted by the City. Notwithstanding the overriding considerations, the applicant is proposing mitigation to reduce the significant impact at this intersection to below significance through bonding for the restriping of the westbound approach from four approach lanes (left, left, through, right) to five approach lanes (left, left, left, through-right, right) satisfactory to the City Engineer. However, if not implemented in the Horizon Year, then the impact would not be mitigated consistent with the Otay Mesa CPU EIR Overriding Considerations.

The intersection of Caliente Ave/SR-905 WB Ramp is identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout. This impact was found to remain significant and unmitigated and a Statement of Overriding Considerations was adopted by the City. Notwithstanding the overriding considerations, the applicant is proposing mitigation to reduce the significant impact at this intersection to below significance. Prior to issuance of the first building permit, owner/permittee shall make a fair share contribution of 8.8% toward PFFP OM T-11.1 that includes the construction of an additional southbound right turn lane satisfactory to the City Engineer. However, if not fully funded by Horizon Year, then the impact would not be mitigated consistent with the Otay Mesa CPU EIR.

The intersection of Caliente Ave/Airway Rd is also identified in the Otay Mesa CPU Final EIR as a significant and unmitigated impact at community buildout. The project proposes mitigation for reduction of its cumulative impact through the installation of signal at this intersection. This intersection is also identified to be signalized as part of the Candlelight VTM MMRP. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational.

The intersection of Otay Mesa Rd/Emerald Crest Court/Street B with full turning movements allowed requires a traffic signal to reduce the project's direct impact to below a level of significance. Prior to issuance of the first building permit, owner/permittee shall install a traffic signal satisfactory to the City Engineer if said signal is not already installed and operational. The signal could be completed by either the adjacent Handler commercial project or by others as outlined in the Deferred Improvement Agreement between Garden Communities and City of San Diego dated 4/24/2007 and secured by a $162,000 bond.

The cumulative segment impact on Caliente Avenue would be reduced to below a level of significance through the project's construction of a raised median along the project frontage. Prior to issuance of the first building permit, owner/permittee shall construct a full width raised median on Caliente Avenue from Otay Mesa Rd to SR-905 WB Ramp.

In addition to the proposed mitigation measures noted above, the applicant proposes the following project features:

1) Construct Street A to full width (public cul-de-sac extending south from Otay Mesa Rd) located approximately 500 feet east of Caliente Avenue (centerline to centerline) with right-in/right-out only access and a right turn deceleration lane on Otay Mesa Road (deceleration lane required to allow access from a primary arterial).

2) Construct Street B to full width (public cul-de-sac extending south from Otay Mesa Rd) located along the eastern project boundary that will align with Emerald Crest Court completing a fourth leg to this existing t-intersection along with a right turn deceleration lane on Otay Mesa Road. Project will remove the existing K-Rail and replace with concrete raised median along with signal installation (as mitigation identified previously).

3) Remove the existing K-Rail with fence on Otay Mesa Road from Caliente Avenue and Emerald Crest Ct and replace with concrete raised median.

4) Construct a full width raised median on Caliente Avenue from Otay Mesa Road to SR-905 WB Ramp.

5) Construct a 6-foot non-contiguous sidewalk along the project frontage on Otay Mesa Road. Replace the existing sidewalk along the project frontage on Caliente Ave with a 6-ft non-contiguous sidewalk that will connect with the existing sidewalk at the Caltrans' ROW.

# # #

Appendix A

City of San Diego Traffic Impact Study Screen Check

CITY OF SAN DIEGO
TRANSPORTATION DEVELOPMENT SECTION
TRAFFIC IMPACT STUDY
SCREEN CHECK

To be completed by City Staff:
Date Received ____________
Reviewer ______________
Date Screen Check _____

To be completed by consultant (including page #):
Name of Traffic Study MIXED-USE COMMERCIAL AND RESIDENTIAL
Consultant LOS ENGINEERING, INC.
Date Submitted APRIL 2018

Indicate Page # in report:

Page	Item	Satisfactory YES	NO	NOT REQUIRED
pg. ii	1. Table of contents, list of figures and list of tables.	☐	☐	
pg. v	2. Executive summary.	☐	☐	
pg. 2	3. Map of the proposed project location	☐	☐	
	4. General project description and background information:			
pg. 15	a. Proposed project description (acres, dwelling units....)	☐	☐	
pg. 15	b. Total trip generation of proposed project.	☐	☐	
pg. 15	c. Community plan assumption for the proposed site.	☐	☐	
pg. 7	d. Discuss how project affects the Congestion Management program.	☐	☐	
pg. 9	5. Parking, transit and on-site circulation discussions are included.	☐	☐	
pg. 12	6. Map of the Transportation Impact Study Area and specific intersections studied in the traffic report.	☐	☐	
pg. 10	7. Existing Transportation Conditions:			
	a. Figure identifying roadway conditions including raised medians, median openings, separate left and right turn lanes, roadway and intersection dimensions, bike lanes, parking, number of travel lanes, posted speed, intersection controls, turn restrictions and intersection lane configurations.	☐	☐	
12	b. Figure indicating the daily (ADT) and peak hour volumes.	☐	☐	
13	c. Figure or table showing level of service (LOS) for intersections during peak hours and roadway sections within the study area (analysis sheets included in the appendix).	☐	☐	
	8. Project Trip Generation:			
pg. 15	Table showing the calculated project generated daily (ADT) and the peak hour volumes.	☐	☐	
pg. 17	9. Project Trip Distribution using the current TRANPLAN Computer Traffic Model (provide a computer plot) or manual assignment if previously approved. (Identify which method was used.)	☐	☐	
	10. Project Traffic Assignment:			
pg. 18	a. Figure indicating the daily (ADT) and peak hour volumes.	☐	☐	
pg. 18	b. Figure showing pass-by-trip adjustments, if cumulative trip rates are used.	☐	☐	☐
	11. Existing + Other Pending Projects:			
pg. 25	a. Figure indicating the daily (ADT) and peak hour volumes.	☐	☐	
pg. 24	b. Figure or table showing the projected LOS for intersections during peak hours and roadway sections within the study area (analysis sheets included in the appendix).	☐	☐	
pg. 15	c. Traffic signal warrant analysis for appropriate locations (signal warrants included in the appendix).	☐	☐	

Satisfactory
YES NO NOT REQUIRED

12. Existing + Other Pending Projects + Project (short term cumulative):

pg. 29,30 a. Figure or table showing the projected LOS for intersections during peak hours and roadway sections with the project (analysis sheets included in the appendix). ☐ ☐

pg. 25,30 b. Figure showing other projects that were included in the study, and the assignment of their site traffic. ☐ ☐

pg. 15 c. Traffic signal warrant analysis for appropriate locations (signal warrants in the appendix). ☐ ☐

13. Build-out Transportation Conditions (if project conforms to the community plan):

pg. NA a. Build-out ADT and street classification that reflect the community plan. ☐ ☐ ☐

pg. NA b. Figure or table showing the build-out LOS for intersections during peak hours and roadway sections with the project (analysis sheets included in the appendix). ☐ ☐ ☐

pg. NA c. Traffic signal warrant analysis at appropriate locations (signal warrants included in the appendix). ☐ ☐ ☐

14. Build-out Transportation Conditions (if project does not conform to the community plan).

pg. 33,34 a. Build-out ADT and street classification as shown in the community plan. ☐ ☐ ☐

pg. 37 b. Build-out ADT and street classification for two scenarios: with the proposed project and with the land use assumed in the community plan. ☐ ☐ ☐

pg. 36-38 c. Figure or table showing the build-out LOS for intersections during peak hours and roadway sections for two scenarios: with the proposed project and with the land use assumed in the community plan (analysis sheets included in the appendix). ☐ ☐ ☐

pg. 15 d. Traffic signal warrant analysis at appropriate locations with the land use assumed in the community plan (signal warrants included in the appendix). ☐ ☐ ☐

pg. 19, 22, 29, 31, 36, 38 15. A summary table showing the comparison of Existing, Existing + Other Pending Projects, Existing + Other Pending Projects + Proposed Project, and Buildout, LOS on roadway sections and intersections during peak hours. ☐ ☐

16. Transportation Mitigation Measures.

pg. 41 a. Table identifying the mitigations required that are the responsibility of the developer and others. A phasing plan is required if mitigations are proposed in phases. ☐ ☐

pg. 39,40 b. Figure showing all proposed mitigations that include: intersection lane configurations, lane widths, raised medians, median openings, roadway and intersection dimensions, right-of-way, offset, etc. ☐ ☐

UPON FINAL VERSION
pg. ___ 17. The traffic study is signed by a California Registered Traffic Engineer. ☐ ☐

pg. 5 18. The Highway Capacity Manual Operational Method or other approved method is used at appropriate locations within the study area. ☐ ☐

pg. 7 19. Analysis complies with Congestion Management requirements. ☐ ☐ ☐

pg. 6 20. Appropriate freeway analysis is included. ☐ ☐ ☐

pg. 6 21. Appropriate freeway ramp metering analysis is included. ☐ ☐ ☐

THE TRAFFIC STUDY SCREEN CHECK FOR THE SUBJECT PROJECT IS:

_________ Approved
_________ Not approved because the following items are missing:

____
____
____
____
____

Appendix B

City of San Diego Segment Capacities

TRAFFIC IMPACT STUDY MANUAL

JULY
1998

TABLE 2
ROADWAY CLASSIFICATIONS, LEVELS OF SERVICE (LOS)
AND AVERAGE DAILY TRIPS (ADT)

			LEVEL OF SERVICE				
STREET CLASSIFICATION			A	B	C	D	E
Freeway	8 lanes		60,000	84,000	120,000	140,000	150,000
Freeway	6 lanes		45,000	63,000	90,000	110,000	120,000
Freeway	4 lanes		30,000	42,000	60,000	70,000	80,000
Expressway	6 lanes	102/122	30,000	42,000	60,000	70,000	80,000
Prime Arterial	6 lanes	102/122	25,000	35,000	50,000	55,000	60,000
Major Arterial	6 lanes	102/122	20,000	28,000	40,000	45,000	50,000
Major Arterial	4 lanes	78/98	15,000	21,000	30,000	35,000	40,000
Collector	4 lanes	72/92	10,000	14,000	20,000	25,000	30,000
Collector (no Center lane) (continuous left-turn lane)	4 lanes 2 lanes	64/84 50/70	5,000	7,000	10,000	13,000	15,000
Collector (no fronting property)	2 lanes	40/60	4,000	5,500	7,500	9,000	10,000
Collector (commercial-industrial fronting	2 lanes	50/70	2,500	3,500	5,000	6,500	8,000
Collector (multi-family)	2 lanes	40/60	2,500	3,500	5,000	6,500	8,000
Sub-Collector (multi-family)	2 lanes	36/56	—	—	2,200	—	—

LEGEND

XXX/XXX = Curb to curb width (feet)/right of way width (feet): based on City of San Diego Street Design Manual

XX/XXX = Approximate recommended ADT based on the City of San Diego Street Design Manual.

NOTES:

1. The volumes and the average daily level of service listed above are only intended as a general planning guideline.

2. Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

BALBOA AVENUE STATION AREA SPECIFIC PLAN

Transportation Impact Study

DECEMBER 2017

Prepared By:

Kimley»Horn

ROADWAY SEGMENT CAPACITY LEVEL OF SERVICE ANALYSIS

In order to determine the operations along the Specific Plan area roadway segments, capacity thresholds and associated LOS have been developed by the City of San Diego and is used as a reference. **Table 3-10** presents this information. The segment traffic volumes under LOS E as shown in this table are considered to be the capacity of the roadway. It should be noted that the values listed in the table are planning-level estimates only. The actual operations of a roadway segment would be affected by the type and frequency of traffic control, driveway density, on street parking, grade, lane width, percent of heavy vehicles, and other factors.

Table 3-10 City of San Diego Roadway Segment Capacity and LOS Summary

Road Class	Lanes	Cross Section[1]	A	B	C	D	E
Freeway	8		60,000	84,000	120,000	140,000	150,000
Freeway	6		45,000	63,000	90,000	110,000	120,000
Freeway	4		30,000	42,000	60,000	70,000	80,000
Expressway	6	102/122	30,000	42,000	60,0000	70,000	80,000
Prime Arterial	8		35,000	50,000	70,000	75,000	80,000
Prime Arterial	7		30,000	42,500	60,000	65,000	70,000
Prime Arterial	6	102/122	25,000	35,000	50,000	55,000	60,000
Prime Arterial	5		22,500	31,500	45,000	50,000	55,000
Prime Arterial	4		20,000	28,000	40,000	45,000	50,000
Major Arterial	8		25,000	35,000	50,000	55,000	60,000
Major Arterial	7		22,500	31,500	45,000	50,000	55,000
Major Arterial	6	102/122	20,000	28,000	40,000	45,000	50,000
Major Arterial	5		17,500	24,500	35,000	40,000	45,000
Major Arterial	4	78/98	15,000	21,000	30,000	35,000	40,000
Major Arterial	3		11,000	15,500	22,500	26,000	30,000
Collector (w/ two-way left turn lane)	4	72/92	10,000	14,000	20,000	25,000	30,000
Collector (w/o two-way left turn lane)	4	64/84	5,000	7,000	10,000	13,000	15,000
Collector (w/ two-way left turn lane)	3		7,500	10,500	15,000	18,750	22,500
Collector (w/ two-way left turn lane)	2	50/70	5,000	7,000	10,000	13,000	15,000
Collector (No fronting property)	2	40/60	4,000	5,500	7,500	9,000	10,000
Collector (w/o two-way left turn lane)	2	40/60	2,500	3,500	5,000	6,500	8,000
Sub-Collector (single-family)	2	36/56	---	---	2,200	---	---

Notes:

The volumes and the average daily level of service listed above are only intended as a general planning guideline.

Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

[1]Cross Section: Curb to Curb width (feet)/Right-of-way width (feet)

Sources:

City of San Diego Traffic Impact Study Manual, Table 2, Page 8, July 1998.

City of San Diego Planning Department Mobility Staff Input

Appendix C

CALTRANS Freeway Flow Rates

GUIDE FOR THE PREPARATION

OF

TRAFFIC IMPACT STUDIES

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

December 2002

Transition between LOS "C" and LOS "D" Criteria

(Reference Highway Capacity Manual)

BASIC FREEWAY SEGMENTS @ 65 mi/hr

LOS	Maximum Density (pc/mi/ln)	Minimum Speed (mph)	Maximum v/c	Maximum Service Flow Rate (pc/hr/ln)
A	11	65.0	0.30	710
B	18	65.0	0.50	1170
C	26	64.6	0.71	1680
D	35	59.7	0.89	2090
E	45	52.2	1.00	2350

SIGNALIZED INTERSECTIONS and RAMP TERMINALS

LOS	Control Delay per Vehicle (sec/veh)
A	≤ 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

MULTI-LANE HIGHWAYS @ 55 mi/hr

LOS	Maximum Density (pc/mi/ln)	Minimum Speed (mph)	Maximum v/c	Maximum Service Flow Rate (pc/hr/ln)
A	11	55.0	0.29	600
B	18	55.0	0.47	990
C	26	54.9	0.68	1430
D	35	52.9	0.88	1850
E	41	51.2	1.00	2100

Dotted line represents the transition between LOS "C" and LOS "D"

Appendix D

CALTRANS Ramp Meter Correspondence

Le, Christy T@DOT <christy.le@dot.ca.gov>
Thu 2/8/2018 5:28 PM
To: Justin Rasas (justin@losengineering.com)
Cc: Yazdan, Fred F@DOT (fred.yazdan@dot.ca.gov)

Hello Justin,

Caliente Ave 905 WB/EB are currently not metering.

Please let me know if you need any additional information and thank you for your patience.

Christy

Final
Program Environmental Impact Report for the Otay Mesa Community Plan Update, City of San Diego

Project Number 30330/304032

SCH No. 2004651076

December 18, 2013

TABLE 5.12-8
CPU HORIZON YEAR RAMP METER OPERATIONS

Peak Hour	Location	Demand[1] (Veh/Hr)	Meter Rate[2] (Veh/Hr)	Excess Demand	Queue (Feet)	Delay[3] (Min)	Exceeds 15-Minute Delay?	Significant? (Exceeds 15 minutes and downstream freeway is LOS E or F)
AM	I-805/Palm Avenue NB (from WB)	1,280	960	320	8,000	20.0	Yes	No[4]
PM	I-805/Palm Avenue NB (from WB)	1,380	960	420	10,500	26.3	Yes	No[4]
AM	I-805/Palm Avenue NB (from EB)	655	960	None	None	None	No	No
PM	I-805/Palm Avenue NB (from EB)	540	960	None	None	None	No	No
AM	I-805/Palm Avenue SB	455	960	None	None	None	No	No
PM	I-805/Palm Avenue SB	645	960	None	None	None	No	No
AM	SR-905/Caliente Avenue WB	1,860	960	900	22,500	56.3	Yes	**Yes**
PM	SR-905/Caliente Avenue WB	1,550	960	590	14,750	36.9	Yes	**Yes**
AM	SR-905/Caliente Avenue EB	400	960	None	None	None	No	No
PM	SR-905/Caliente Avenue EB	400	960	None	None	None	No	No
AM	SR-905/Heritage Road WB	1,135	960	175	4,375	10.9	Yes	No
PM	SR-905/Heritage Road WB	2,550	960	1,590	39,750	99.4	Yes	**Yes**
AM	SR-905/Heritage Road EB	360	960	None	None	None	No	No
PM	SR-905/Heritage Road EB	800	960	None	None	None	No	No
AM	SR-905/Britannia Blvd. WB	1,350	960	390	9,750	24.4	Yes	**Yes**
PM	SR-905/Britannia Blvd. WB	3,355	960	2,395	59,875	149.1	Yes	**Yes**
AM	SR-905/Britannia Blvd. EB	710	960	None	None	None	No	No
PM	SR-905/Britannia Blvd. EB	1,400	960	440	11,000	27.5	Yes	**Yes**
AM	SR-905/La Media Road WB	2,050	960	1,090	27,250	68.1	Yes	**Yes**
PM	SR-905/La Media Road WB	3,025	960	2,065	51,625	129.0	Yes	**Yes**
AM	SR-905/La Media Road EB	1,000	960	40	1,000	2.5	No	No
PM	SR-905/La Media Road EB	1,950	960	990	24,750	61.8	Yes	No[4]
AM	SR-905/Siempre Viva Rd. NB	1,185	960	225	5,625	14.1	No	No
PM	SR-905/Siempre Viva Rd. NB	3,510	960	2,550	63,750	159.4	Yes	No[4]
AM	SR-905/Siempre Viva Rd. SB	750	960	None	None	None	No	No
PM	SR-905/Siempre Viva Rd. SB	1,670	960	710	17,750	44.4	Yes	No[4]
AM	SR-125/Otay Mesa Rd. NB	1,680	960	720	24,000	45.0	Yes	No[4]
PM	SR-125/Otay Mesa Rd. NB	2,455	960	1,495	37,375	93.4	Yes	No[4]
AM	SR-125/Lone Star Rd. NB	850	960	None	None	None	No	No
PM	SR-125/Lone Star Rd. NB	3,615	960	2,655	66,375	166.0	Yes	No[4]

SOURCE: Appendix J (Urban Systems Associates, Inc. 2012).
Bold indicates a significant impact.
[1]Total hourly volume entering from both directions.
[2]Most restrictive meter rate used, per Caltrans. This Veh/Hr assumes 2 lanes and 2 cars per green light on a 15-second cycle.
[3]$Delay = \frac{Excess\ Demand\ (vehicles)}{Meter\ Rate\ (vehicles\ per\ hour)}\ x\ 60\ min.per\ hour$
[4]While the delay exceeds 15 minutes, the downstream freeway operates at acceptable LOS. Thus, this impact is considered less than significant.

Appendix E

City of San Diego Community Roadway Classification Maps and Land Use

Otay Mesa
Community Plan Update



Planning, Neighborhoods & Economic Development Department

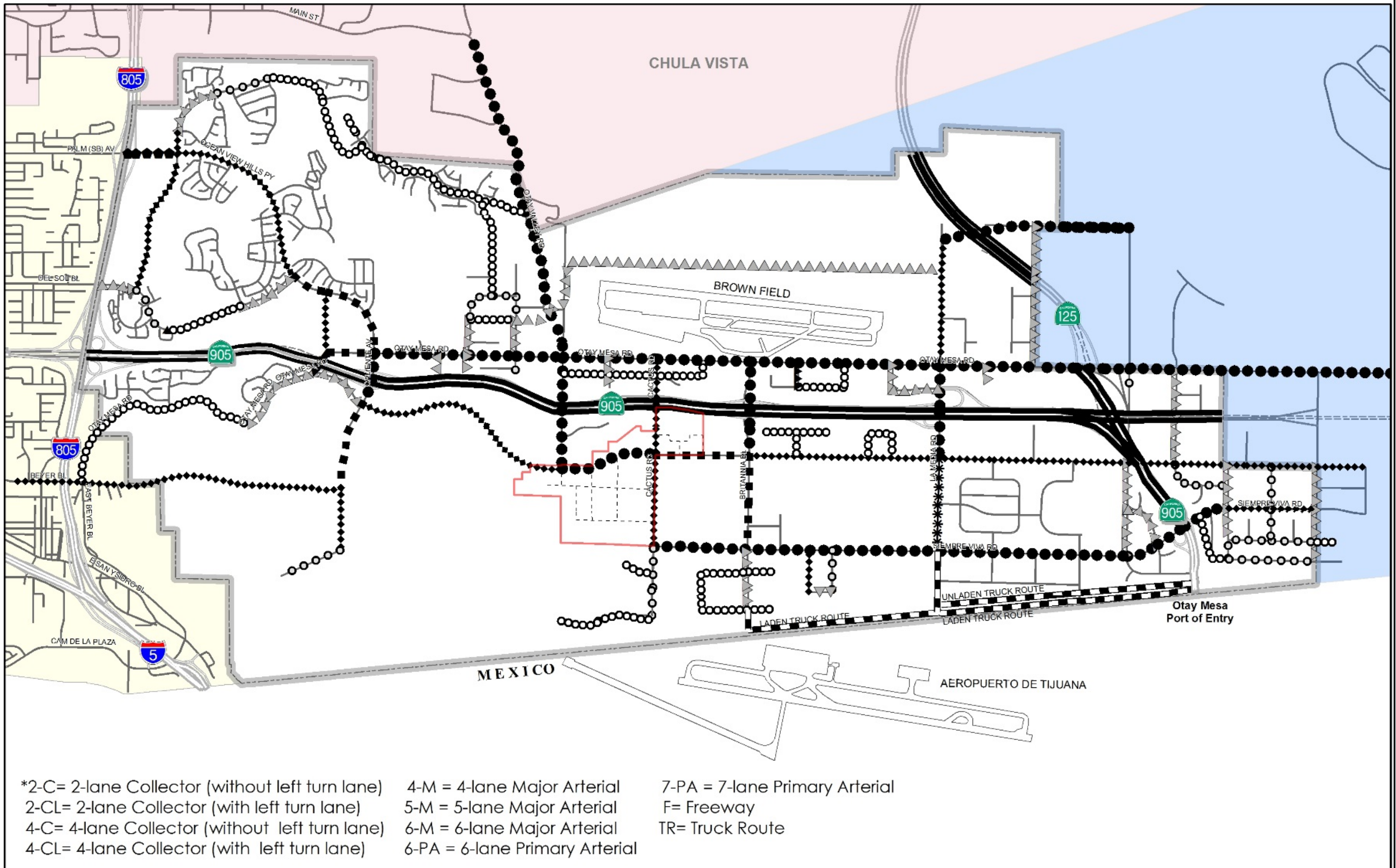
March 11, 2014

City of San Diego

OTAY MESA COMMUNITY PLAN

Amendment	Date Approved by Planning Commission	Resolution Number	Date Adopted by City Council	Resolution Number
Otay Mesa Community Plan Adopted	February 13, 2014		March 11, 2014	R-308810
Corrections to address inconsistencies between the Land Use and Zoning Map. Minor map and text corrections to show land use and the removal of paper streets from map figures	April 30, 2015	R-4685	June 2, 2015	R-309773
Otay Mesa Central Village Specific Plan Adopted	February 23, 2017		April 13, 2017	R-311020

Editor's note: After the adoption of the Otay Mesa Community Plan, it was noticed that Figure 3-2 depicted the street classifications for Otay Pacific Drive, Otay Pacific Place, and Las Californias incorrectly; these streets were classified pursuant to City Council Resolution R-307235 on January 10, 2012, which the reclassification was not captured in all places in the Otay Mesa Community Update documents, including Figure 3-2; and therefore, Figure 3-2 in Document Number R-308810 is replaced with Figure 3-2.



THE CITY OF SAN DIEGO

OTAY MESA ROADWAY CLASSIFICATION - Figure 3-2

Legend

2-C* 4-C* 4-M* 6-M* 7-PA* TR*

2-CL* 4-CL* 5-M* 6-PA* F*

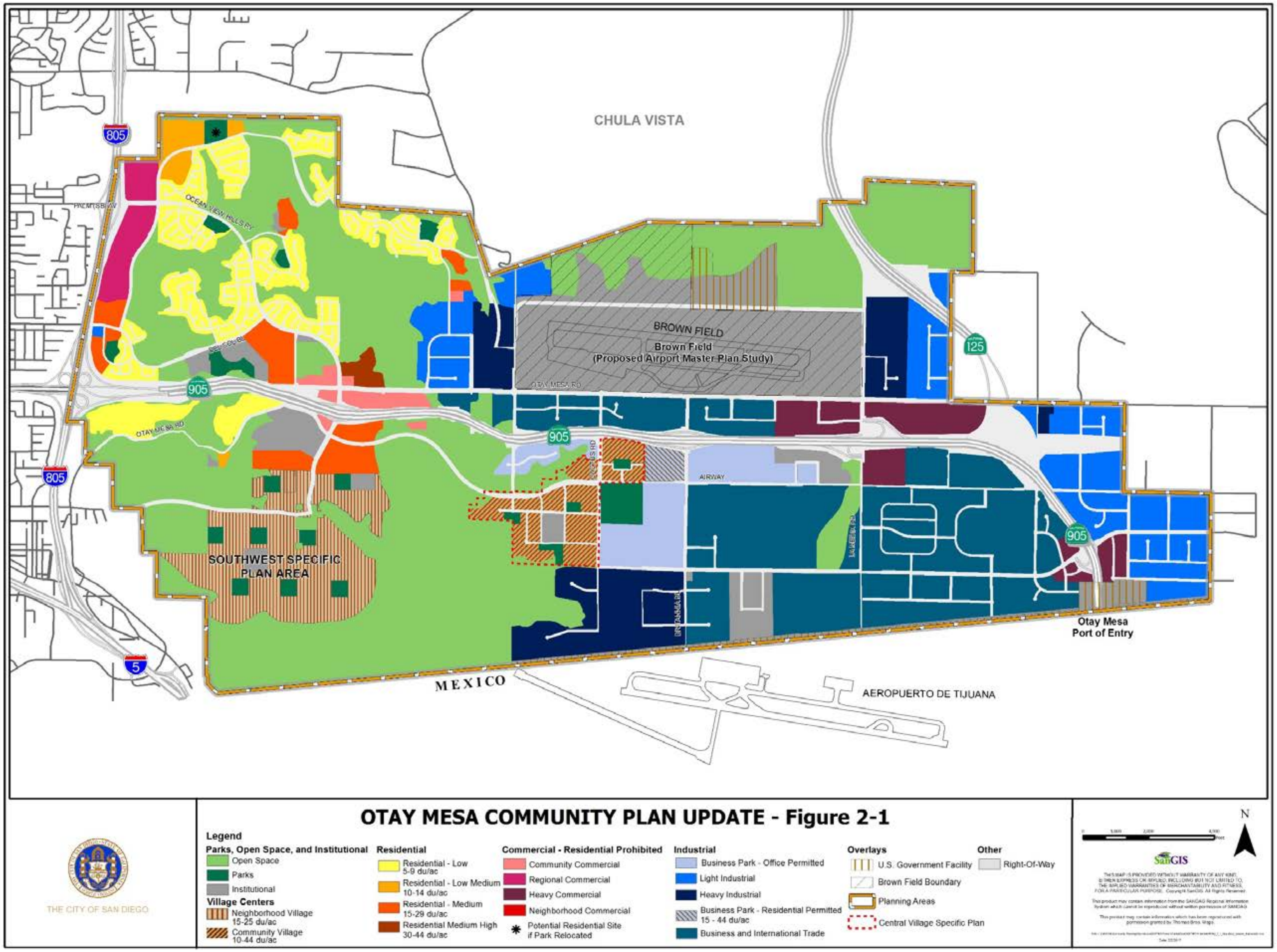
Central Village Boundary

Refer to Central Village Specific Plan for additional detail and Roadway Classification

NOTE: For illustrative purposes only does not reflect future alignments.

N

SanGIS



CHULA VISTA
805
OCEAN VIEW HILLS PY
BROWN FIELD
Brown Field
(Proposed Airport Master Plan Study)
905
125
OTAY MESA RD
AIRWAY
SOUTHWEST SPECIFIC PLAN AREA
5
MEXICO
AEROPUERTO DE TIJUANA
Otay Mesa Port of Entry
THE CITY OF SAN DIEGO
OTAY MESA COMMUNITY PLAN UPDATE - Figure 2-1
Legend
Parks, Open Space, and Institutional
Open Space
Parks
Institutional
Village Centers
Neighborhood Village 15-25 du/ac
Community Village 10-44 du/ac
Residential
Residential - Low 5-9 du/ac
Residential - Low Medium 10-14 du/ac
Residential - Medium 15-29 du/ac
Residential Medium High 30-44 du/ac
Commercial - Residential Prohibited
Community Commercial
Regional Commercial
Heavy Commercial
Neighborhood Commercial
Potential Residential Site if Park Relocated
Industrial
Business Park - Office Permitted
Light Industrial
Heavy Industrial
Business Park - Residential Permitted 15 - 44 du/ac
Business and International Trade
Overlays
U.S. Government Facility
Brown Field Boundary
Planning Areas
Central Village Specific Plan
Other
Right-Of-Way
N
SanGIS

Appendix F

Transit Map and Schedules

CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*

	905	950
Day Pass (Regional) / *Pase diario (Regional)* Compass Card required ($2) / Se requiere un Compass Card ($2)	$5.00	
One-Way Fare / *Tarifa de una direccíon*	$2.25	$2.50
Senior (60+)/Disabled/Medicare / *Mayores de 60 años/Discapacitados/Medicare*	$1.10*	$1.25*
Children 5 & under / *Niños de 5 años o menos* Up to two children ride free per paying adult / Máximo dos niños viajan gratis por cada adulto	FREE / *GRATIS*	

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	$72.00
Senior (60+)/Disabled/Medicare / *Mayores de 60 años/Discapacitados/Medicare*	$18.00*
Youths (18 and under) / *Jóvenes (18 años o menos)*	$36.00*

*I.D. required for discount fare or pass.
Se requiere identificación para tarifas o pases de descuento.

DAY PASS (REGIONAL) / *Pase diario (Regional)*

All passes are sold on Compass Card, which can be reloaded and reused for up to five years. Compass Cards are available for $2 at select outlets. A $5 Day Pass requires a Compass Card. A paper Day Pass can be purchased on board buses for an additional $2 fee.

Todos los pases se venden en el Compass Card, el cual puede ser recargado y reutilizado por hasta cinco años. Compass Cards están disponibles por $2 en selectas sucursales. Un pase de un día por $5 requiere un Compass Card. Un pase de un día de papel se puede obtener a bordo los autobuses por un costo adicional de $2.

DIRECTORY / *Directorio*

Regional Transit Information / *Información de transporte público regional*	511 or/ó (619) 233-3004
TTY/TDD (teletype for hearing impaired) / *Teletipo para sordos*	(619) 234-5005 or/ó (888) 722-4889
InfoExpress (24-hour info via Touch-Tone phone) / *Información las 24 horas (via teléfono de teclas)*	(619) 685-4900
Customer Service / Suggestions / *Servicio al cliente / Sugerencias*	(619) 557-4555
SafeWatch	(619) 557-4500
Lost & Found / *Objetos extraviados*	(619) 557-4555
Transit Store	(619) 234-1060 12th & Imperial Transit Center M–F 8am–5pm
For MTS online trip planning / *Planificación de viajes por Internet*	sdmts.com

For more information on riding MTS services, pick up a Rider's Guide on a bus or at the Transit Store, or visit **sdmts.com**.

Para obtener más información sobre el uso de los servicios de MTS, recoja un 'Rider's Guide' en un autobús o en la Transit Store, o visita a ***sdmts.com***.

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective JANUARY 28, 2018

905 950

905 Otay Mesa – Iris Transit Center via SR-905 / Otay Mesa Rd.

950 Otay Mesa – Iris Transit Center Express via SR-905

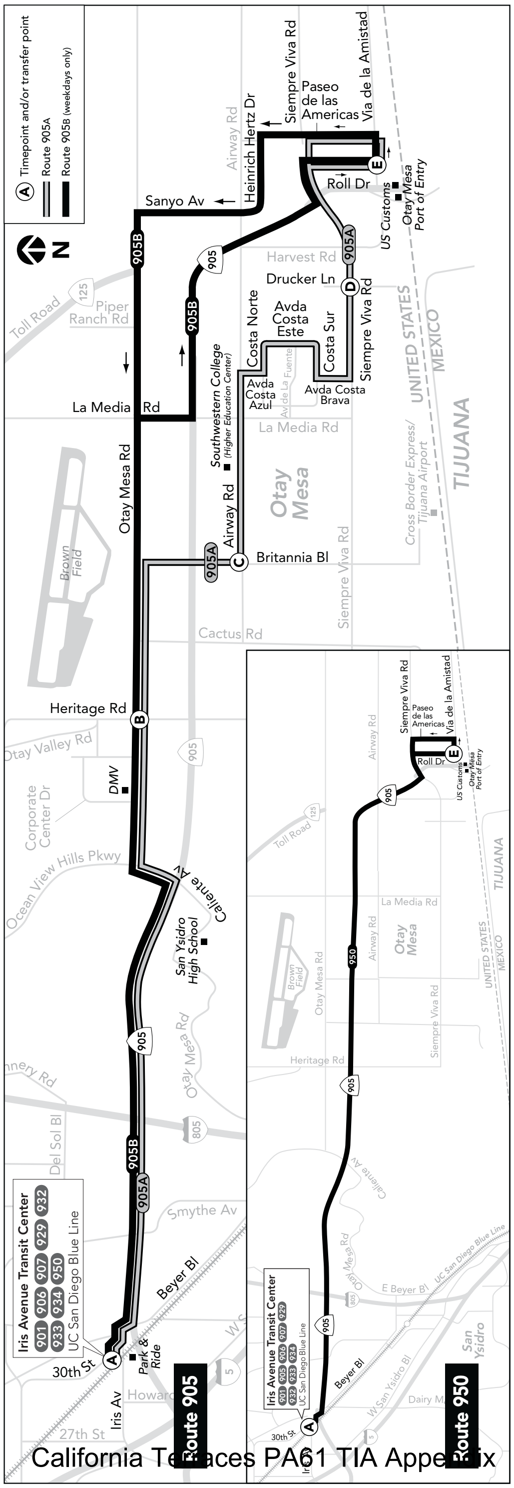
DESTINATIONS
- Brown Field
- Otay Mesa Industrial Parks
- Otay Mesa Port of Entry
- San Ysidro High School
- Southwestern College (Higher Education Center)

TROLLEY CONNECTIONS Iris Av.

Metropolitan Transit System

01/18

Alternative formats available upon request. Please call: (619) 557-4555 / *Formato alternativo disponible al preguntar. Favor de llamar: (619) 557-4555*



The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses.

Los horarios e información que se indican en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.

Route 905 & 950 – Saturday & Sunday / *sábado y domingo*

Otay Mesa Port of Entry ➡ Iris Avenue Transit Center

	(E) Otay Mesa Port of Entry DEPART	(D) Siempre Viva Rd. & Drucker Ln.	(C) Airway Rd. & Britannia Bl.	(B) Otay Mesa Rd. & Heritage Rd.	(A) Iris Avenue Transit Center ARRIVE
950	5:15a	EXPRESS			5:29a
A	5:35	5:39a	5:45a	5:50a	5:58
950	5:55	EXPRESS			6:09
950	6:16	EXPRESS			6:30
A	6:31	6:35	6:41	6:47	6:56
950	6:46	EXPRESS			7:00
A	7:26	7:30	7:36	7:42	7:51
950	7:46	EXPRESS			8:00
A	8:26	8:30	8:36	8:42	8:51
950	8:46	EXPRESS			9:00
A	9:26	9:30	9:36	9:42	9:51
950	9:46	EXPRESS			10:00
A	10:26	10:30	10:36	10:42	10:51
950	10:46	EXPRESS			11:00
A	11:26	11:30	11:36	11:42	11:51
950	11:46	EXPRESS			**12:00p**
A	**12:26p**	**12:31p**	**12:38p**	**12:44p**	**12:52**
950	**12:46**	**EXPRESS**			**1:00**
A	**1:26**	**1:31**	**1:38**	**1:44**	**1:52**
950	**1:46**	**EXPRESS**			**2:00**
A	**2:55**	**3:00**	**3:07**	**3:13**	**3:21**
A	**3:55**	**4:00**	**4:07**	**4:13**	**4:21**
A	**4:55**	**5:00**	**5:07**	**5:13**	**5:21**
A	**5:55**	**5:58**	**6:05**	**6:11**	**6:18**
A	**6:55**	**6:58**	**7:05**	**7:11**	**7:18**

Route 905 & 950 – Saturday & Sunday / *sábado y domingo*

Iris Avenue Transit Center ➡ Otay Mesa Port of Entry

	(A) Iris Avenue Transit Center DEPART	(B) Otay Mesa Rd. & Heritage Rd.	(C) Airway Rd. & Britannia Bl.	(D) Siempre Viva Rd. & Drucker Ln.	(E) Otay Mesa Port of Entry ARRIVE
A	6:15a	6:22a	6:26a	6:31a	6:36a
A	7:15	7:22	7:26	7:32	7:38
A	8:15	8:22	8:26	8:32	8:38
A	9:15	9:22	9:26	9:32	9:38
A	10:15	10:22	10:26	10:33	10:39
A	11:15	11:22	11:26	11:33	11:39
A	**12:15p**	**12:22p**	**12:26p**	**12:33p**	**12:39p**
A	**1:15**	**1:22**	**1:26**	**1:33**	**1:39**
A	**2:15**	**2:22**	**2:26**	**2:33**	**2:39**
950	**2:35**	**EXPRESS**			**2:49**
A	**3:15**	**3:22**	**3:26**	**3:33**	**3:39**
950	**3:35**	**EXPRESS**			**3:49**
A	**4:15**	**4:22**	**4:26**	**4:33**	**4:39**
950	**4:35**	**EXPRESS**			**4:49**
A	**5:15**	**5:22**	**5:26**	**5:32**	**5:37**
950	**5:35**	**EXPRESS**			**5:49**
A	**6:15**	**6:22**	**6:26**	**6:32**	**6:37**
A	**7:15**	**7:22**	**7:26**	**7:32**	**7:37**

Route 950 - Adult cash fare is $2.50 ($5.00 Day Pass with Compass Card, or $72 Monthly Pass).
Ruta 950 *- Pasaje en efectivo para adultos es $2.50 ($5.00 pase de un día con Compass Card o pase mensual de $72).*
A = Route 905A. Trip serves Otay Mesa Industrial Park. / *Ruta 905A. Viaje que ofrece servicio a Otay Mesa Industrial Park.*

A Saturday or Sunday schedule will be operated on the following holidays and observed holidays
Se operará con horario de sábado o domingo durante los siguientes días festivos y feriados observados >>> New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas

Route 905 – Monday through Friday / *lunes a viernes*

Iris Avenue Transit Center ➡ Otay Mesa Port of Entry

	Ⓐ Iris Avenue Transit Center DEPART	Ⓑ Otay Mesa Rd. & Heritage Rd.	Ⓒ Airway Rd. & Britannia Bl.	Ⓓ Siempre Viva Rd. & Drucker Ln.	Ⓔ Otay Mesa Port of Entry ARRIVE
A	5:00a	5:07a	5:12a	5:17a	5:22a
A	5:29	5:36	5:41	5:44	5:49
A	5:55	6:02	6:07	6:14	6:20
A	6:15	6:22	6:27	6:34	6:40
A	6:35	6:43	6:48	6:56	7:02
A	6:55	7:03	7:08	7:16	7:22
A	7:15	7:23	7:28	7:36	7:42
A	7:35	7:43	7:48	7:56	8:02
B	7:55	8:03	—	—	8:16
A	8:20	8:28	8:33	8:41	8:47
B	8:44	8:52	—	—	9:05
A	9:05	9:13	9:18	9:26	9:32
B	9:44	9:52	—	—	10:05
A	10:05	10:13	10:18	10:26	10:32
B	10:44	10:52	—	—	11:05
A	11:05	11:13	11:18	11:26	11:32
B	11:44	11:52	—	—	**12:05p**
A	**12:05p**	**12:13p**	**12:18p**	**12:26p**	**12:32**
B	**12:44**	**12:52**	—	—	**1:05**
A	**1:05**	**1:13**	**1:18**	**1:26**	**1:32**
B	**1:44**	**1:52**	—	—	**2:05**
A	**2:05**	**2:13**	**2:18**	**2:26**	**2:32**
B	**2:44**	**2:52**	—	—	**3:05**
A	**3:07**	**3:15**	**3:20**	**3:28**	**3:34**
B	**3:34**	**3:42**	—	—	**3:55**
A	**3:54**	**4:02**	**4:07**	**4:15**	**4:21**
B	**4:15**	**4:23**	—	—	**4:36**
A	**4:35**	**4:43**	**4:48**	**4:56**	**5:02**
B	**5:00**	**5:08**	—	—	**5:21**
A	**5:25**	**5:33**	**5:38**	**5:45**	**5:50**
B	**5:50**	**5:58**	—	—	**6:10**
A	**6:20**	**6:28**	**6:33**	**6:40**	**6:45**
A	**6:50**	**6:58**	**7:03**	**7:10**	**7:15**
A	**7:40**	**7:48**	**7:52**	**7:58**	**8:03**
A	**8:05**	**8:13**	**8:17**	**8:23**	**8:28**
A	**8:30**	**8:38**	**8:42**	**8:48**	**8:53**
A	**9:00**	**9:08**	**9:12**	**9:18**	**9:23**

Otay Mesa Port of Entry ➡ Iris Avenue Transit Center

	Ⓔ Otay Mesa Port of Entry DEPART	Ⓓ Siempre Viva Rd. & Drucker Ln.	Ⓒ Airway Rd. & Britannia Bl.	Ⓑ Otay Mesa Rd. & Heritage Rd.	Ⓐ Iris Avenue Transit Center ARRIVE
A	4:15a	4:18a	4:23a	4:28a	4:35a
B	4:35	—	—	4:46	4:53
A	4:55	4:59	5:05	5:11	5:19
B	5:20	—	—	5:31	5:39
A	5:40	5:44	5:50	5:56	6:04
B	6:00	—	—	6:12	6:21
A	6:20	6:24	6:31	6:38	6:47
B	6:40	—	—	6:52	7:01
A	7:00	7:04	7:11	7:18	7:27
B	7:20	—	—	7:32	7:41
A	7:40	7:44	7:51	7:58	8:07
B	8:00	—	—	8:12	8:22
A	8:20	8:24	8:31	8:38	8:48
B	8:40	—	—	8:52	9:02
A	9:00	9:04	9:11	9:18	9:28
B	9:30	—	—	9:42	9:52
A	10:00	10:04	10:11	10:18	10:28
B	10:30	—	—	10:42	10:52
A	11:00	11:04	11:11	11:18	11:28
B	11:30	—	—	11:42	11:52
A	**12:00p**	**12:04p**	**12:11p**	**12:18p**	**12:28p**
B	**12:30**	—	—	**12:42**	**12:52**
A	**1:00**	**1:04**	**1:11**	**1:18**	**1:28**
B	**1:30**	—	—	**1:42**	**1:52**
A	**2:00**	**2:04**	**2:12**	**2:20**	**2:30**
B	**2:30**	—	—	**2:42**	**2:52**
A	**2:56**	**3:00**	**3:08**	**3:16**	**3:26**
B	**3:22**	—	—	**3:35**	**3:45**
A	**3:44**	**3:48**	**3:56**	**4:04**	**4:14**
B	**4:04**	—	—	**4:17**	**4:27**
A	**4:28**	**4:32**	**4:40**	**4:48**	**4:58**
B	**4:50**	—	—	**5:03**	**5:13**
A	**5:12**	**5:16**	**5:24**	**5:32**	**5:42**
B	**5:35**	—	—	**5:47**	**5:57**
A	**6:05**	**6:08**	**6:15**	**6:22**	**6:32**
A	**6:50**	**6:53**	**7:00**	**7:07**	**7:17**
A	**7:28**	**7:31**	**7:38**	**7:45**	**7:55**
A	**8:13**	**8:16**	**8:23**	**8:30**	**8:40**

A = Route 905A. Trip serves Otay Mesa Industrial Park. / *Ruta 905A. Viaje que ofrece servicio a Otay Mesa Industrial Park.*
B = Route 905B. Westbound trip via Sanyo Ave. Eastbound trip via La Media Rd & SR-905. / *Ruta 905B. Viaje hacia el oeste via Sanyo Ave. Viaje hacia el este via La Media Rd & SR-905.*

Route 950 – Monday through Friday / *lunes a viernes*

Iris Avenue Transit Center ➡ Otay Mesa Port of Entry

Ⓐ Iris Avenue Transit Center DEPART		Ⓔ Otay Mesa Port of Entry ARRIVE
12:17p	**EXPRESS** →	**12:31p**
12:47	**EXPRESS** →	**1:01**
1:17	**EXPRESS** →	**1:31**
1:42	**EXPRESS** →	**1:56**
2:02	**EXPRESS** →	**2:16**
2:22	**EXPRESS** →	**2:36**
2:42	**EXPRESS** →	**2:56**
3:02	**EXPRESS** →	**3:16**
3:22	**EXPRESS** →	**3:36**
3:42	**EXPRESS** →	**3:56**
4:02	**EXPRESS** →	**4:16**
4:22	**EXPRESS** →	**4:36**
4:42	**EXPRESS** →	**4:56**
5:02	**EXPRESS** →	**5:16**
5:22	**EXPRESS** →	**5:36**
5:42	**EXPRESS** →	**5:56**
6:02	**EXPRESS** →	**6:16**
6:22	**EXPRESS** →	**6:36**
6:42	**EXPRESS** →	**6:56**
7:02	**EXPRESS** →	**7:16**
7:20	**EXPRESS** →	**7:34**
7:47	**EXPRESS** →	**8:01**
8:17	**EXPRESS** →	**8:31**
8:47	**EXPRESS** →	**9:01**
9:32	**EXPRESS** →	**9:46**

Otay Mesa Port of Entry ➡ Iris Avenue Transit Center

Ⓔ Otay Mesa Port of Entry DEPART		Ⓐ Iris Avenue Transit Center ARRIVE
4:30a	EXPRESS →	4:44a
4:45	EXPRESS →	4:59
5:00	EXPRESS →	5:14
5:12	EXPRESS →	5:26
5:24	EXPRESS →	5:38
5:36	EXPRESS →	5:50
5:48	EXPRESS →	6:02
6:00	EXPRESS →	6:14
6:12	EXPRESS →	6:26
6:24	EXPRESS →	6:38
6:36	EXPRESS →	6:50
6:48	EXPRESS →	7:02
7:00	EXPRESS →	7:14
7:12	EXPRESS →	7:26
7:24	EXPRESS →	7:38
7:36	EXPRESS →	7:50
7:48	EXPRESS →	8:02
8:04	EXPRESS →	8:18
8:24	EXPRESS →	8:38
8:44	EXPRESS →	8:58
9:04	EXPRESS →	9:18
9:24	EXPRESS →	9:38
9:44	EXPRESS →	9:58
10:15	EXPRESS →	10:29
10:45	EXPRESS →	10:59
11:15	EXPRESS →	11:29
11:45	EXPRESS →	11:59
12:15p	**EXPRESS** →	**12:29p**

Appendix G

Excerpts from City of San Diego Bicycle Master Plan Update and Community Plan

City of San Diego Bicycle Master Plan

San Diego, California

FINAL – Deceber 2013

PREPARED BY:
Alta Planning + Design
PREPARED FOR:
The City of San Diego

City of San Diego Bicycle Master Plan, December 2013

Existing Bicycle Routes

Figure 3-4:
San Diego Existing Bikeways (South)

Otay Mesa
Community Plan Update



Planning, Neighborhoods & Economic Development Department

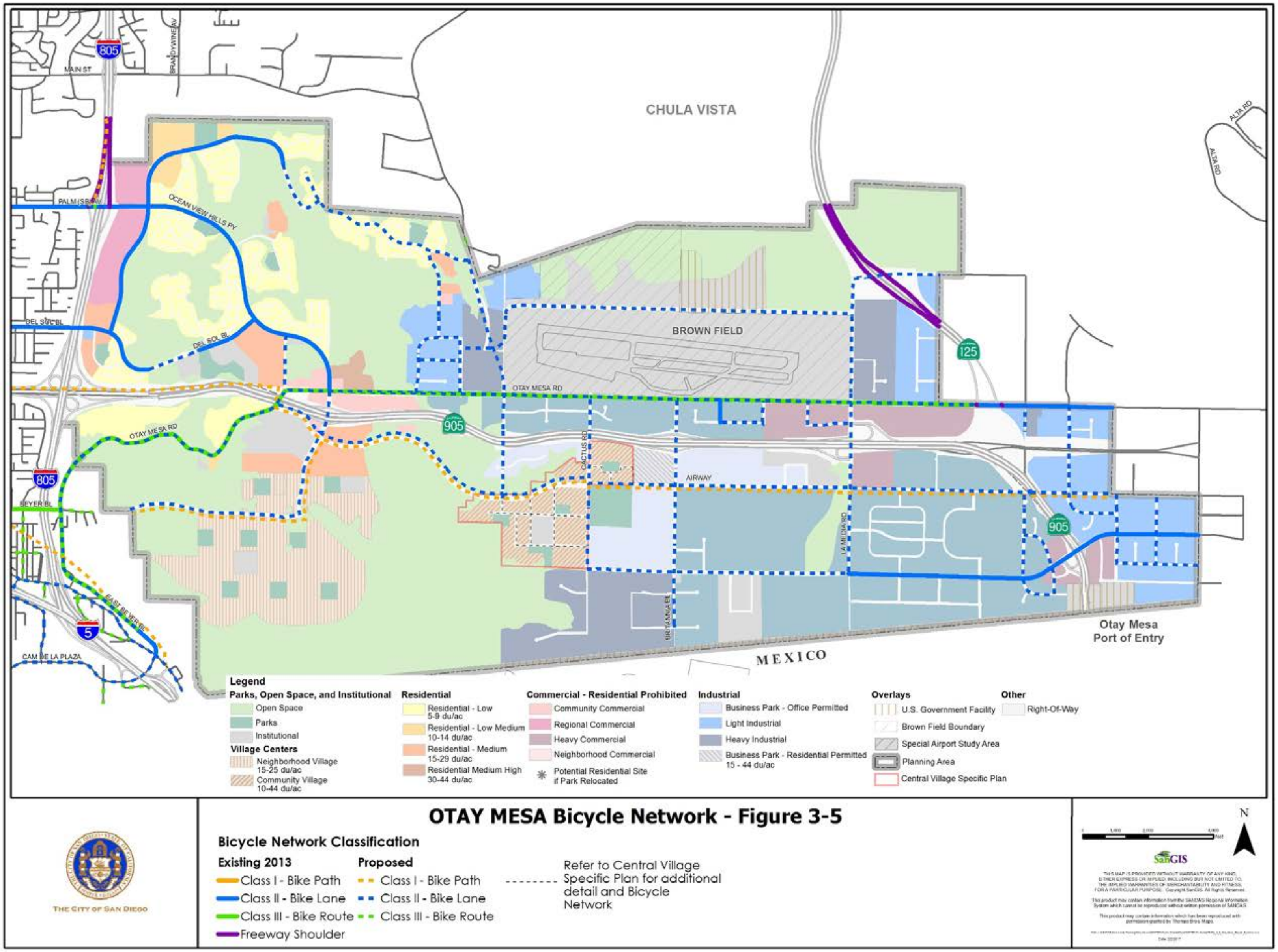
March 11, 2014

City of San Diego

OTAY MESA COMMUNITY PLAN

Amendment	Date Approved by Planning Commission	Resolution Number	Date Adopted by City Council	Resolution Number
Otay Mesa Community Plan Adopted	February 13, 2014		March 11, 2014	R-308810
Corrections to address inconsistencies between the Land Use and Zoning Map. Minor map and text corrections to show land use and the removal of paper streets from map figures	April 30, 2015	R-4685	June 2, 2015	R-309773
Otay Mesa Central Village Specific Plan Adopted	February 23, 2017		April 13, 2017	R-311020

Editor's note: After the adoption of the Otay Mesa Community Plan, it was noticed that Figure 3-2 depicted the street classifications for Otay Pacific Drive, Otay Pacific Place, and Las Californias incorrectly; these streets were classified pursuant to City Council Resolution R-307235 on January 10, 2012, which the reclassification was not captured in all places in the Otay Mesa Community Update documents, including Figure 3-2; and therefore, Figure 3-2 in Document Number R-308810 is replaced with Figure 3-2.



OTAY MESA Bicycle Network - Figure 3-5

Appendix H

Count Data and Signal Timing Sheets

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Caliente Avenue
B/ Otay Mesa Road - Interstate 805 Westbound

File Name 006
Site Code: 143-18041
24 Hour Directional Volume Count

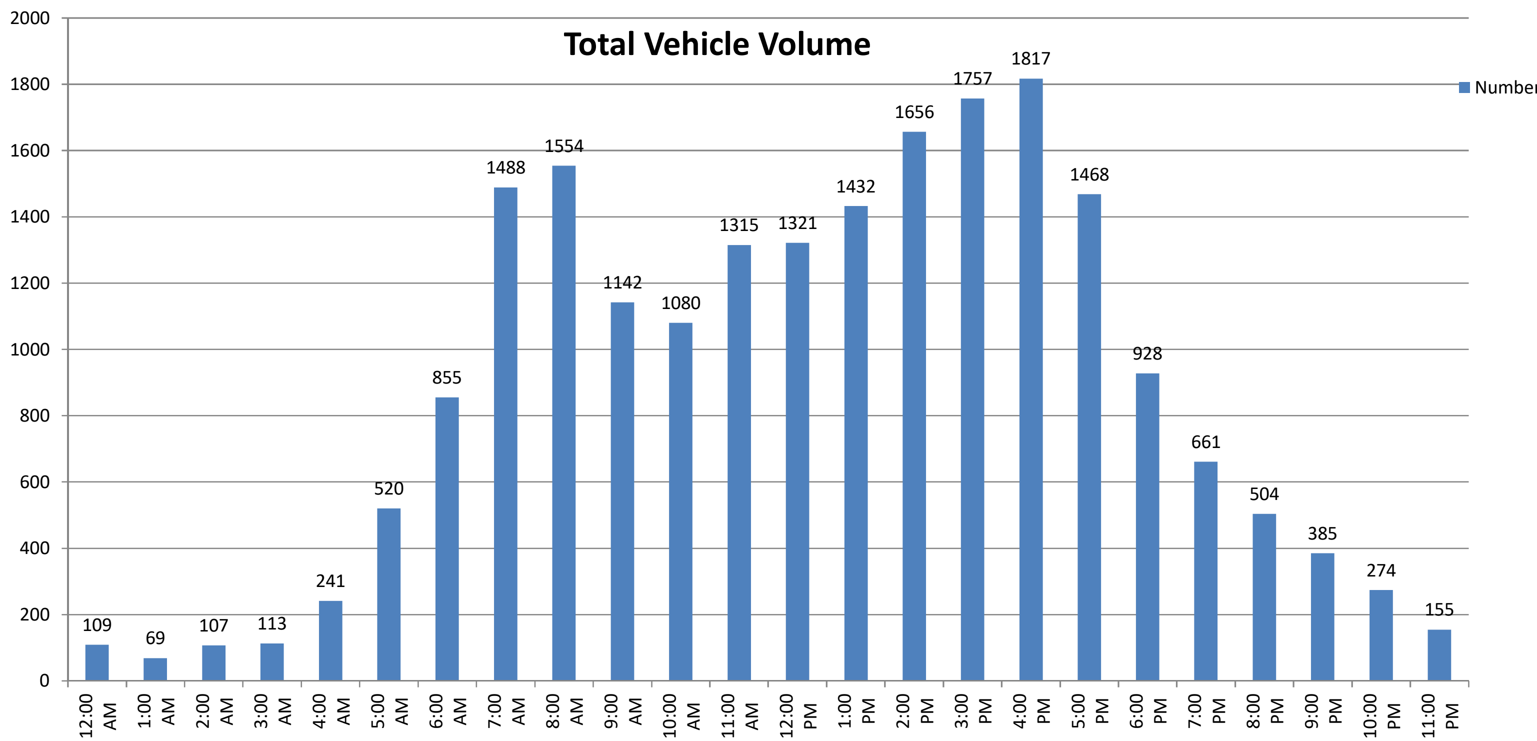
Date:	Northbound				Southbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	16	149			23	173				
12:15	15	151			13	178				
12:30	9	168			13	159				
12:45	9	162	49	630	11	181	60	691	109	1321
1:00	11	198			6	154				
1:15	12	180			2	173				
1:30	6	174			12	179				
1:45	11	212	40	764	9	162	29	668	69	1432
2:00	24	186			14	222				
2:15	12	190			8	208				
2:30	11	181			4	215				
2:45	22	194	69	751	12	260	38	905	107	1656
3:00	13	204			7	253				
3:15	8	209			23	230				
3:30	16	180			15	286				
3:45	17	176	54	769	14	219	59	988	113	1757
4:00	17	216			26	220				
4:15	23	309			34	250				
4:30	20	204			33	225				
4:45	41	160	101	889	47	233	140	928	241	1817
5:00	31	164			62	264				
5:15	40	140			80	212				
5:30	59	147			92	201				
5:45	72	142	202	593	84	198	318	875	520	1468
6:00	67	145			86	169				
6:15	94	136			92	125				
6:30	102	98			105	107				
6:45	192	87	455	466	117	61	400	462	855	928
7:00	115	92			130	82				
7:15	175	82			155	86				
7:30	238	84			221	71				
7:45	266	90	794	348	188	74	694	313	1488	661
8:00	247	73			183	64				
8:15	174	80			158	59				
8:30	185	57			195	66				
8:45	206	55	812	265	206	50	742	239	1554	504
9:00	155	84			163	41				
9:15	138	44			133	55				
9:30	132	50			141	37				
9:45	140	46	565	224	140	28	577	161	1142	385
10:00	128	41			150	50				
10:15	132	41			121	31				
10:30	150	45			139	32				
10:45	119	19	529	146	141	15	551	128	1080	274
11:00	143	25			161	11				
11:15	160	24			160	8				
11:30	166	22			178	10				
11:45	165	41	634	112	182	14	681	43	1315	155
Totals	4304	5957			4289	6401				
Combined Totals		10261				10690				
ADT										20951
AM Peak Hour	715	AM			730	AM				
Volume	926				750					
P.H.F.	0.870				0.848					
PM Peak Hour		345	PM			245	PM			
Volume		905				1029				
P.H.F.		0.732				0.899				
Percentage	41.9%	58.1%			40.1%	59.9%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

24 Hour Volume Plot

Caliente Avenue
B/ Otay Mesa Road - Interstate 805 Westbound
1/18/2018

Start Time	1/18/2018
12:00 AM	109
1:00 AM	69
2:00 AM	107
3:00 AM	113
4:00 AM	241
5:00 AM	520
6:00 AM	855
7:00 AM	1488
8:00 AM	1554
9:00 AM	1142
10:00 AM	1080
11:00 AM	1315
12:00 PM	1321
1:00 PM	1432
2:00 PM	1656
3:00 PM	1757
4:00 PM	1817
5:00 PM	1468
6:00 PM	928
7:00 PM	661
8:00 PM	504
9:00 PM	385
10:00 PM	274
11:00 PM	155
Total	20951



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Caliente Avenue
B/ Interstate 905 Westbound - Interstate 905 Eastbound

File Name 007
Site Code: 143-18041
24 Hour Directional Volume Count

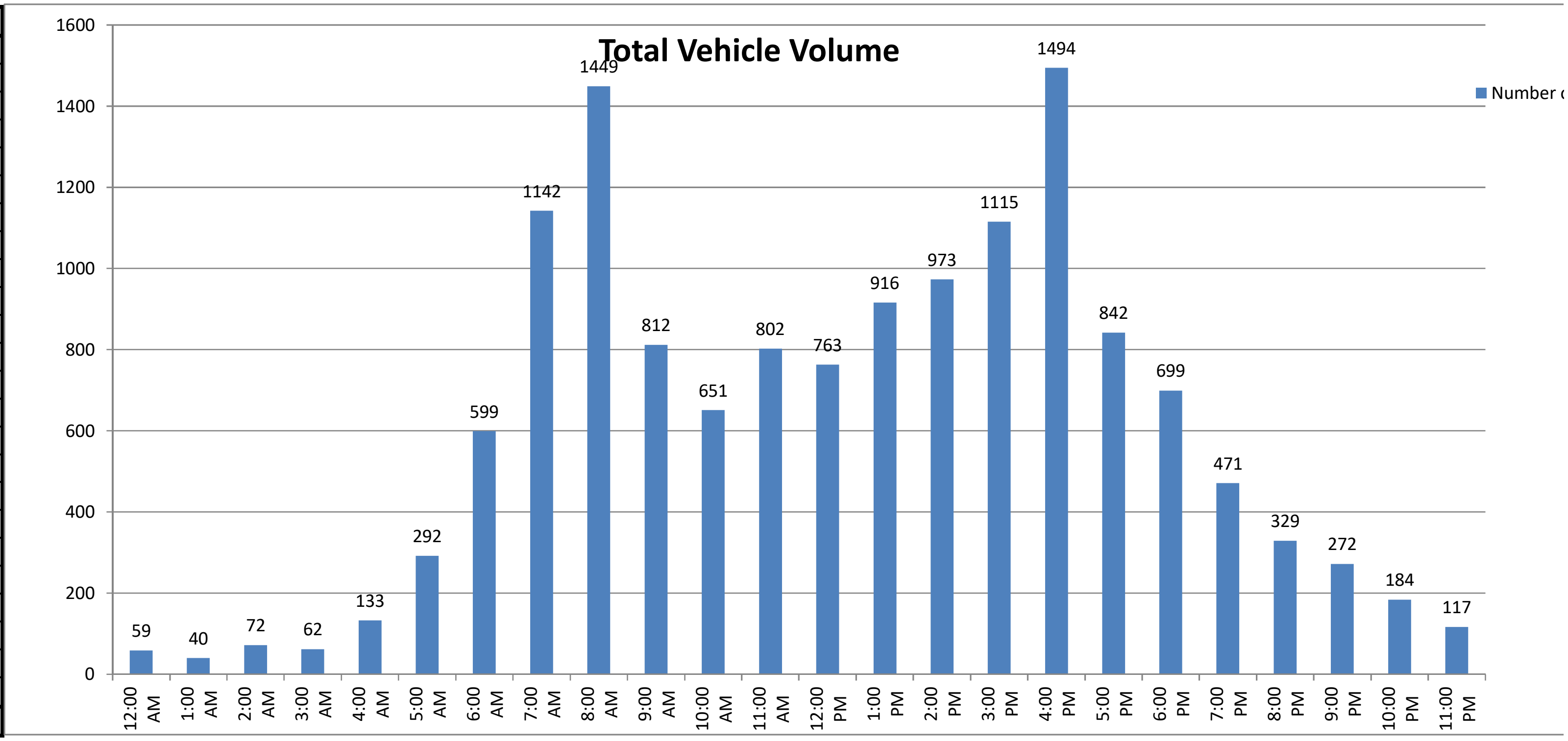
Date:	Northbound				Southbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	18	149			1	27				
12:15	12	162			5	36				
12:30	10	169			0	34				
12:45	10	148	50	628	3	38	9	135	59	763
1:00	13	209			1	26				
1:15	9	175			0	44				
1:30	9	199			0	28				
1:45	8	208	39	791	0	27	1	125	40	916
2:00	24	196			1	52				
2:15	12	194			3	42				
2:30	11	181			1	36				
2:45	19	216	66	787	1	56	6	186	72	973
3:00	16	210			2	60				
3:15	7	220			2	71				
3:30	13	207			1	62				
3:45	18	214	54	851	3	71	8	264	62	1115
4:00	19	341			1	97				
4:15	24	418			3	57				
4:30	33	287			1	40				
4:45	48	192	124	1238	4	62	9	256	133	1494
5:00	45	175			7	41				
5:15	62	176			3	33				
5:30	63	148			8	39				
5:45	92	177	262	676	12	53	30	166	292	842
6:00	84	173			5	41				
6:15	113	178			15	33				
6:30	117	122			18	25				
6:45	216	112	530	585	31	15	69	114	599	699
7:00	156	100			17	17				
7:15	214	111			35	23				
7:30	259	88			64	19				
7:45	318	98	947	397	79	15	195	74	1142	471
8:00	293	80			58	12				
8:15	225	75			66	10				
8:30	276	57			93	18				
8:45	300	65	1094	277	138	12	355	52	1449	329
9:00	248	82			40	12				
9:15	155	56			30	12				
9:30	152	52			24	13				
9:45	144	41	699	231	19	4	113	41	812	272
10:00	128	36			21	13				
10:15	147	48			24	16				
10:30	151	42			24	7				
10:45	135	20	561	146	21	2	90	38	651	184
11:00	162	27			34	5				
11:15	154	22			36	3				
11:30	167	21			45	1				
11:45	172	34	655	104	32	4	147	13	802	117
Totals	5081	6711			1032	1464				
Combined Totals		11792				2496				
ADT										14288
AM Peak Hour	745	AM			800	AM				
Volume	1112				355					
P.H.F.	0.874				0.643					
PM Peak Hour		345	PM			315	PM			
Volume		1260				301				
P.H.F.		0.754				0.776				
Percentage	43.1%	56.9%			41.3%	58.7%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

24 Hour Volume Plot

Caliente Avenue
B/ Interstate 905 Westbound - Interstate 905 Eastbound
1/18/2018

Start Time	1/18/2018
12:00 AM	59
1:00 AM	40
2:00 AM	72
3:00 AM	62
4:00 AM	133
5:00 AM	292
6:00 AM	599
7:00 AM	1142
8:00 AM	1449
9:00 AM	812
10:00 AM	651
11:00 AM	802
12:00 PM	763
1:00 PM	916
2:00 PM	973
3:00 PM	1115
4:00 PM	1494
5:00 PM	842
6:00 PM	699
7:00 PM	471
8:00 PM	329
9:00 PM	272
10:00 PM	184
11:00 PM	117
Total	14288



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Caliente Avenue
B/ Interstate 905 Eastbound - Airway Road

File Name 008
Site Code: 143-18041
24 Hour Directional Volume Count

Date:	Northbound				Southbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	1	27			5	30				
12:15	2	45			2	33				
12:30	1	26			2	27				
12:45	2	25	6	123	1	32	10	122	16	245
1:00	1	45			4	33				
1:15	1	41			3	49				
1:30	1	46			0	33				
1:45	0	52	3	184	0	41	7	156	10	340
2:00	0	46			1	53				
2:15	1	63			3	39				
2:30	2	40			1	51				
2:45	0	56	3	205	0	56	5	199	8	404
3:00	1	46			3	72				
3:15	2	54			3	81				
3:30	1	62			1	101				
3:45	1	74	5	236	2	165	9	419	14	655
4:00	4	221			0	188				
4:15	8	294			2	111				
4:30	17	157			1	72				
4:45	13	82	42	754	1	76	4	447	46	1201
5:00	26	67			4	66				
5:15	25	55			4	66				
5:30	22	45			4	74				
5:45	31	73	104	240	7	104	19	310	123	550
6:00	35	75			13	98				
6:15	31	78			11	63				
6:30	41	44			30	50				
6:45	46	41	153	238	31	38	85	249	238	487
7:00	58	25			34	38				
7:15	73	39			37	32				
7:30	93	27			71	38				
7:45	130	20	354	111	162	33	304	141	658	252
8:00	116	16			125	23				
8:15	109	13			128	23				
8:30	165	14			223	23				
8:45	232	7	622	50	224	29	700	98	1322	148
9:00	148	13			109	16				
9:15	49	7			44	27				
9:30	43	13			22	21				
9:45	30	4	270	37	36	9	211	73	481	110
10:00	34	3			18	12				
10:15	31	13			30	19				
10:30	31	5			27	12				
10:45	37	3	133	24	30	5	105	48	238	72
11:00	42	7			34	6				
11:15	32	0			34	10				
11:30	33	4			35	6				
11:45	43	0	150	11	34	9	137	31	287	42
Totals	1845	2213			1596	2293				
Combined Totals		4058				3889				
ADT										7947
AM Peak Hour	815	AM			800	AM				
Volume	654				700					
P.H.F.	0.705				0.781					
PM Peak Hour		400	PM			330	PM			
Volume		754				565				
P.H.F.		0.641				0.751				
Percentage	45.5%	54.5%			41.0%	59.0%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

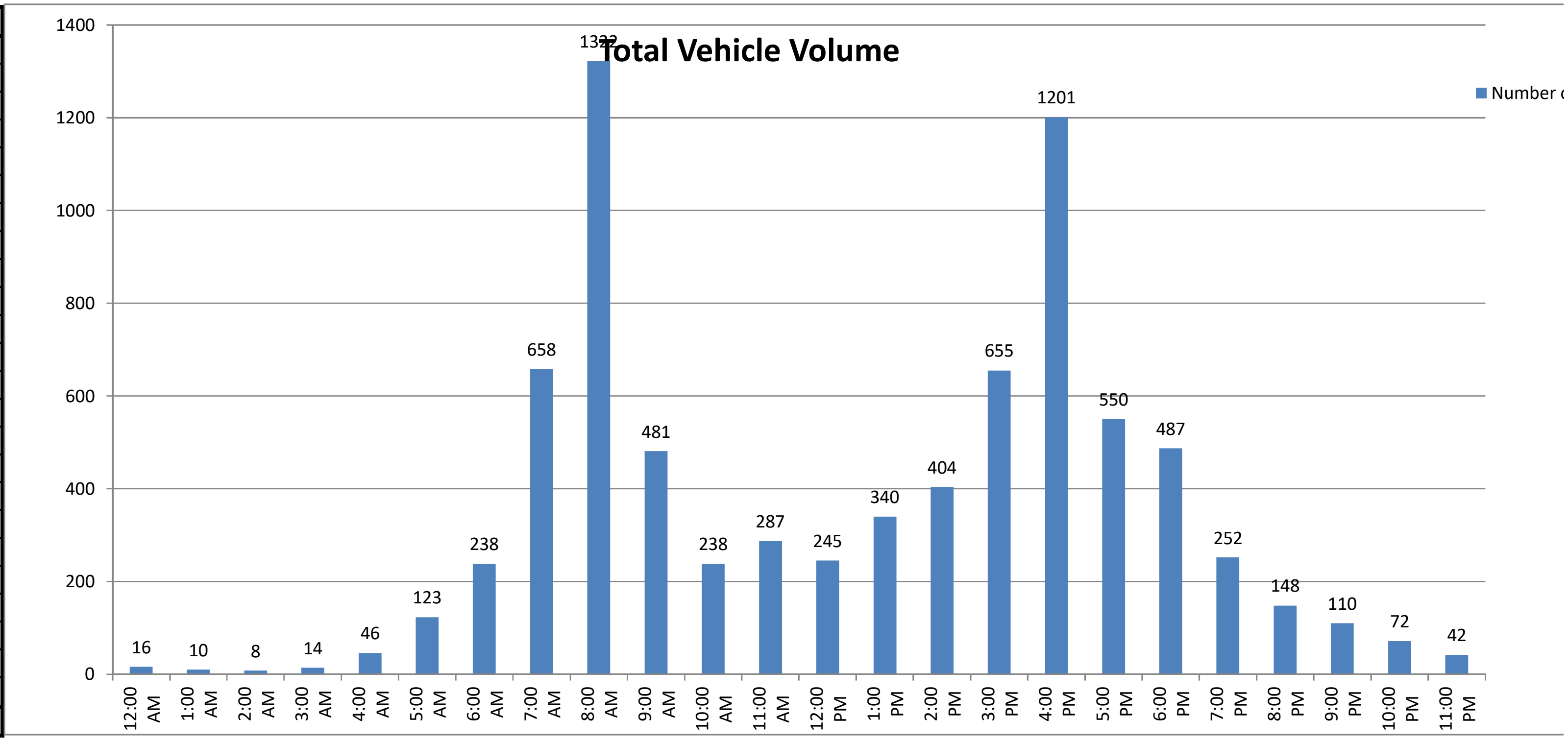
24 Hour Volume Plot

Caliente Avenue

B/ Interstate 905 Eastbound - Airway Road

1/18/2018

Start Time	1/18/2018
12:00 AM	16
1:00 AM	10
2:00 AM	8
3:00 AM	14
4:00 AM	46
5:00 AM	123
6:00 AM	238
7:00 AM	658
8:00 AM	1322
9:00 AM	481
10:00 AM	238
11:00 AM	287
12:00 PM	245
1:00 PM	340
2:00 PM	404
3:00 PM	655
4:00 PM	1201
5:00 PM	550
6:00 PM	487
7:00 PM	252
8:00 PM	148
9:00 PM	110
10:00 PM	72
11:00 PM	42
Total	7947



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Ocean View Hills Parkway
B/ Starfish Way - Sea Drift Way

File Name 001
Site Code: 143-18041
24 Hour Directional Volume Count

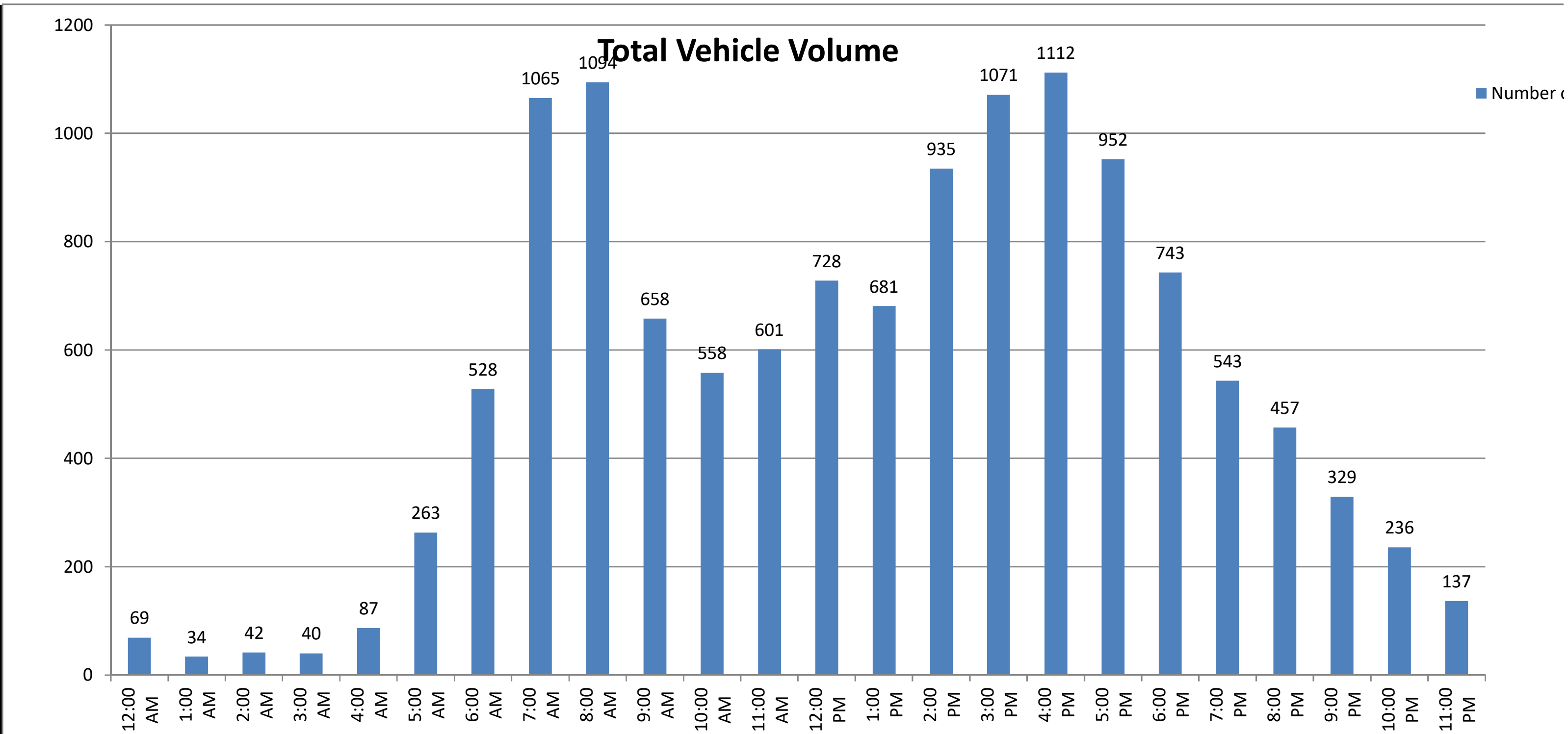
Date:	Northbound				Southbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	12	85			14	81				
12:15	7	95			12	95				
12:30	7	90			8	93				
12:45	5	91	31	361	4	98	38	367	69	728
1:00	1	89			7	75				
1:15	3	91			4	73				
1:30	3	78			8	90				
1:45	1	87	8	345	7	98	26	336	34	681
2:00	7	97			4	109				
2:15	4	124			4	107				
2:30	9	113			3	130				
2:45	3	133	23	467	8	122	19	468	42	935
3:00	4	254			4	97				
3:15	8	162			1	118				
3:30	8	112			6	93				
3:45	7	126	27	654	2	109	13	417	40	1071
4:00	4	116			3	133				
4:15	16	188			1	133				
4:30	17	155			10	123				
4:45	28	142	65	601	8	122	22	511	87	1112
5:00	32	128			3	111				
5:15	56	139			12	117				
5:30	57	130			24	94				
5:45	60	139	205	536	19	94	58	416	263	952
6:00	61	103			38	109				
6:15	84	117			33	125				
6:30	79	88			62	83				
6:45	90	47	314	355	81	71	214	388	528	743
7:00	98	70			96	80				
7:15	108	55			112	71				
7:30	131	52			189	74				
7:45	170	52	507	229	161	89	558	314	1065	543
8:00	138	63			180	60				
8:15	194	45			97	80				
8:30	157	51			93	63				
8:45	121	38	610	197	114	57	484	260	1094	457
9:00	132	33			88	54				
9:15	86	35			56	58				
9:30	82	32			65	48				
9:45	92	27	392	127	57	42	266	202	658	329
10:00	84	27			55	41				
10:15	70	27			56	36				
10:30	75	21			75	20				
10:45	89	33	318	108	54	31	240	128	558	236
11:00	73	18			75	26				
11:15	77	16			68	20				
11:30	98	6			49	18				
11:45	78	17	326	57	83	16	275	80	601	137
Totals	2826	4037			2213	3887				
Combined Totals		6863				6100				
ADT										12963
AM Peak Hour	745	AM			715	AM				
Volume	659				642					
P.H.F.	0.849				0.849					
PM Peak Hour		230	PM			400	PM			
Volume		662				511				
P.H.F.		0.652				0.961				
Percentage	41.2%	58.8%			36.3%	63.7%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

24 Hour Volume Plot

Ocean View Hills Parkway
B/ Starfish Way - Sea Drift Way
1/18/2018

Start Time	1/18/2018
12:00 AM	69
1:00 AM	34
2:00 AM	42
3:00 AM	40
4:00 AM	87
5:00 AM	263
6:00 AM	528
7:00 AM	1065
8:00 AM	1094
9:00 AM	658
10:00 AM	558
11:00 AM	601
12:00 PM	728
1:00 PM	681
2:00 PM	935
3:00 PM	1071
4:00 PM	1112
5:00 PM	952
6:00 PM	743
7:00 PM	543
8:00 PM	457
9:00 PM	329
10:00 PM	236
11:00 PM	137
Total	12963



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Ocean View Hills Parkway
B/ Sea Drift Way - Del Sol Boulevard

File Name 002
Site Code: 143-18041
24 Hour Directional Volume Count

Date:	Northbound				Southbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	6	74			13	78				
12:15	7	64			7	79				
12:30	6	87			1	91				
12:45	2	57	21	282	4	82	25	330	46	612
1:00	4	77			6	62				
1:15	2	64			5	70				
1:30	1	65			7	86				
1:45	5	65	12	271	7	77	25	295	37	566
2:00	5	100			0	109				
2:15	4	102			4	96				
2:30	4	72			3	114				
2:45	3	173	16	447	8	98	15	417	31	864
3:00	9	158			4	95				
3:15	4	104			2	95				
3:30	6	110			5	96				
3:45	7	102	26	474	2	109	13	395	39	869
4:00	10	120			3	132				
4:15	11	165			6	108				
4:30	16	124			7	115				
4:45	21	109	58	518	5	101	21	456	79	974
5:00	30	121			10	89				
5:15	39	116			16	98				
5:30	40	129			20	86				
5:45	44	109	153	475	33	91	79	364	232	839
6:00	46	101			35	98				
6:15	55	79			52	94				
6:30	74	49			68	64				
6:45	64	61	239	290	79	63	234	319	473	609
7:00	66	52			103	61				
7:15	85	42			159	64				
7:30	119	42			148	77				
7:45	110	44	380	180	142	57	552	259	932	439
8:00	118	44			126	63				
8:15	142	43			73	64				
8:30	98	28			116	46				
8:45	96	36	454	151	105	53	420	226	874	377
9:00	80	32			59	40				
9:15	71	27			47	48				
9:30	61	20			49	43				
9:45	64	23	276	102	58	25	213	156	489	258
10:00	59	30			51	32				
10:15	57	15			57	27				
10:30	66	22			65	18				
10:45	63	18	245	85	57	22	230	99	475	184
11:00	53	14			62	13				
11:15	74	6			53	18				
11:30	77	11			62	13				
11:45	61	12	265	43	80	12	257	56	522	99
Totals	2145	3318			2084	3372				
Combined Totals		5463				5456				
ADT										10919
AM Peak Hour	730	AM			715	AM				
Volume	489				575					
P.H.F.	0.861				0.904					
PM Peak Hour		245	PM			345	PM			
Volume		545				464				
P.H.F.		0.788				0.879				
Percentage	39.3%	60.7%			38.2%	61.8%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

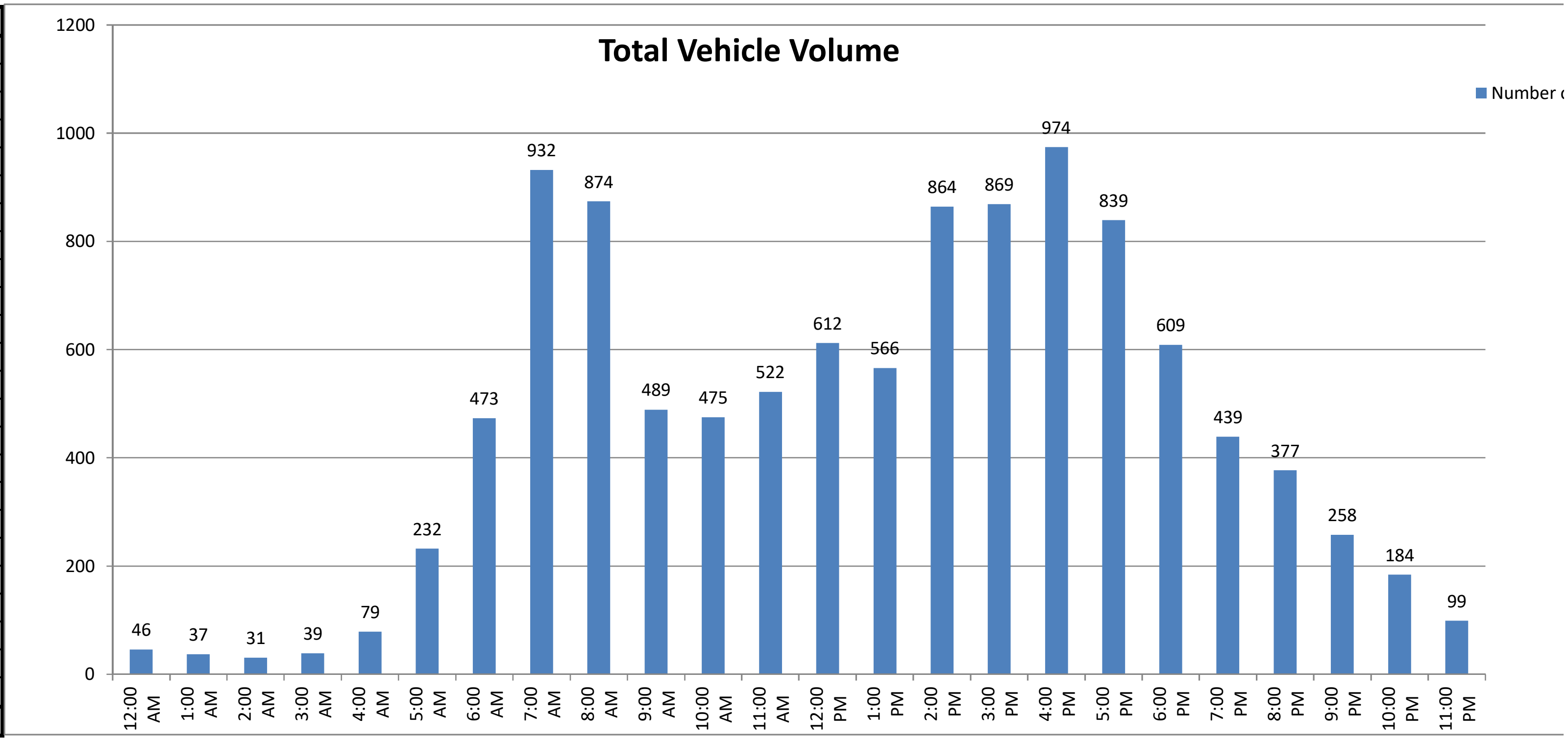
24 Hour Volume Plot

Ocean View Hills Parkway

B/ Sea Drift Way - Del Sol Boulevard

1/18/2018

Start Time	1/18/2018
12:00 AM	46
1:00 AM	37
2:00 AM	31
3:00 AM	39
4:00 AM	79
5:00 AM	232
6:00 AM	473
7:00 AM	932
8:00 AM	874
9:00 AM	489
10:00 AM	475
11:00 AM	522
12:00 PM	612
1:00 PM	566
2:00 PM	864
3:00 PM	869
4:00 PM	974
5:00 PM	839
6:00 PM	609
7:00 PM	439
8:00 PM	377
9:00 PM	258
10:00 PM	184
11:00 PM	99
Total	10919



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Ocean View Hills Parkway
B/ Del Sol Boulevard - Sea Fire Point

File Name 003
Site Code: 143-18041
24 Hour Directional Volume Count

Date:	Northbound				Southbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	5	88			9	53				
12:15	5	71			4	58				
12:30	6	83			1	72				
12:45	4	60	20	302	4	72	18	255	38	557
1:00	4	83			5	56				
1:15	2	74			0	64				
1:30	1	81			6	50				
1:45	5	110	12	348	5	53	16	223	28	571
2:00	6	111			0	104				
2:15	3	129			3	89				
2:30	4	101			2	89				
2:45	3	114	16	455	5	165	10	447	26	902
3:00	7	102			2	122				
3:15	5	86			3	95				
3:30	2	105			4	84				
3:45	4	94	18	387	4	89	13	390	31	777
4:00	9	139			4	108				
4:15	10	192			6	88				
4:30	9	140			9	87				
4:45	12	103	40	574	12	78	31	361	71	935
5:00	17	122			12	71				
5:15	20	116			23	67				
5:30	30	125			27	75				
5:45	31	103	98	466	28	86	90	299	188	765
6:00	48	97			29	80				
6:15	30	85			29	77				
6:30	50	67			45	56				
6:45	51	60	179	309	59	29	162	242	341	551
7:00	61	60			72	44				
7:15	115	44			100	51				
7:30	141	44			165	50				
7:45	131	47	448	195	135	43	472	188	920	383
8:00	154	40			134	46				
8:15	65	42			132	41				
8:30	76	26			125	31				
8:45	98	34	393	142	123	38	514	156	907	298
9:00	71	28			54	25				
9:15	54	33			55	29				
9:30	51	25			45	30				
9:45	63	21	239	107	45	18	199	102	438	209
10:00	51	28			42	16				
10:15	52	15			58	15				
10:30	62	18			49	12				
10:45	68	21	233	82	42	14	191	57	424	139
11:00	64	10			50	12				
11:15	65	8			44	6				
11:30	68	10			62	6				
11:45	55	16	252	44	59	14	215	38	467	82
Totals	1948	3411			1931	2758				
Combined Totals		5359				4689				
ADT										10048
AM Peak Hour	715	AM			730	AM				
Volume	541				566					
P.H.F.	0.878				0.858					
PM Peak Hour		400	PM			230	PM			
Volume		574				471				
P.H.F.		0.747				0.714				
Percentage	36.4%	63.6%			41.2%	58.8%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

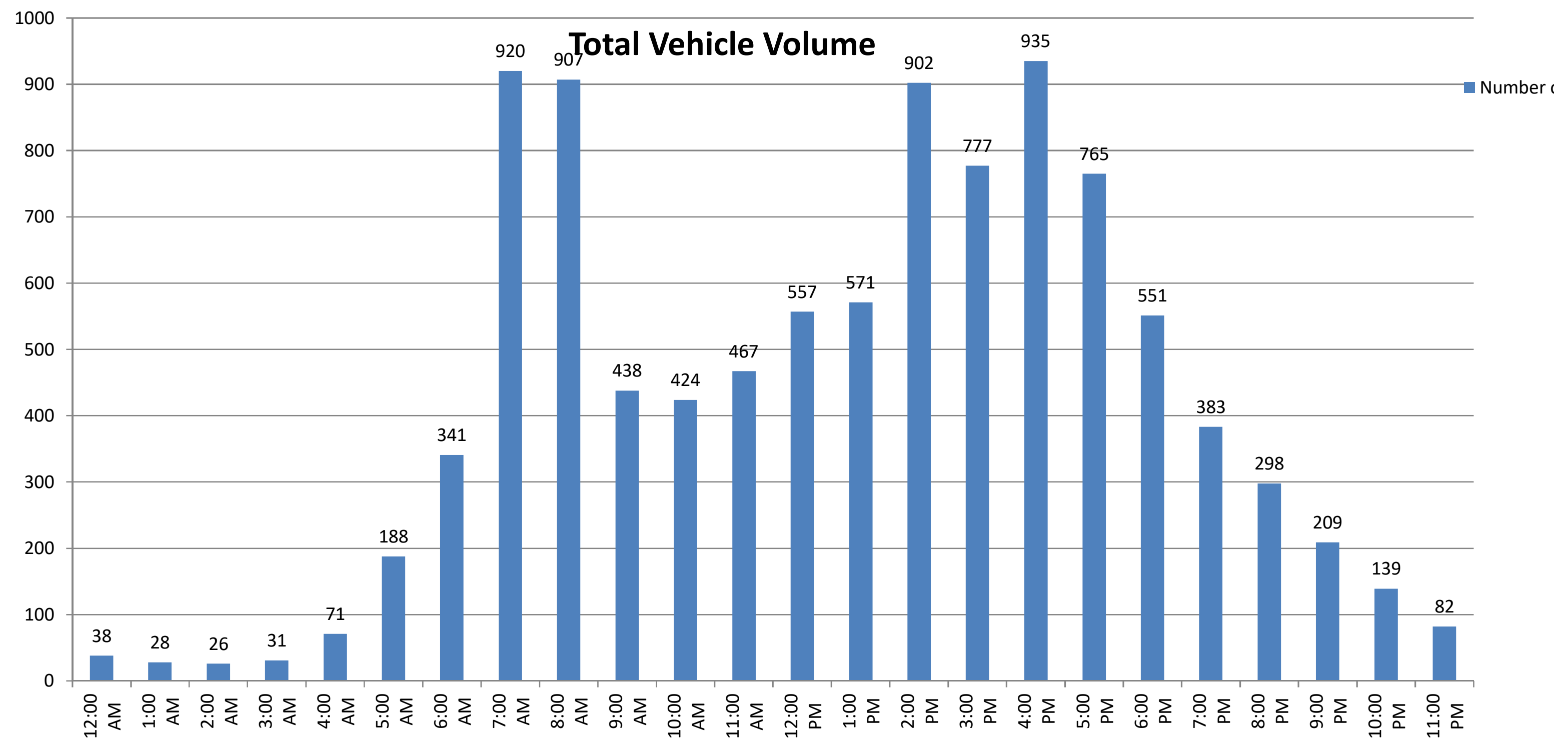
24 Hour Volume Plot

Ocean View Hills Parkway

B/ Del Sol Boulevard - Sea Fire Point

1/18/2018

Start Time	1/18/2018
12:00 AM	38
1:00 AM	28
2:00 AM	26
3:00 AM	31
4:00 AM	71
5:00 AM	188
6:00 AM	341
7:00 AM	920
8:00 AM	907
9:00 AM	438
10:00 AM	424
11:00 AM	467
12:00 PM	557
1:00 PM	571
2:00 PM	902
3:00 PM	777
4:00 PM	935
5:00 PM	765
6:00 PM	551
7:00 PM	383
8:00 PM	298
9:00 PM	209
10:00 PM	139
11:00 PM	82
Total	10048



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Ocean View Hills Parkway
B/ Sea Fire Point - Hidden Trails Road

File Name 004
Site Code: 143-18041
24 Hour Directional Volume Count

Date:	Northbound				Southbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	11	64			8	55				
12:15	6	76			4	66				
12:30	6	72			6	53				
12:45	7	57	30	269	1	75	19	249	49	518
1:00	3	61			4	52				
1:15	2	73			2	57				
1:30	3	71			2	62				
1:45	1	77	9	282	7	57	15	228	24	510
2:00	7	115			2	57				
2:15	3	107			1	113				
2:30	3	115			3	92				
2:45	6	113	19	450	6	84	12	346	31	796
3:00	3	104			1	170				
3:15	7	97			3	111				
3:30	2	83			4	74				
3:45	4	107	16	391	6	93	14	448	30	839
4:00	3	100			4	91				
4:15	9	194			1	104				
4:30	11	158			12	77				
4:45	6	115	29	567	14	80	31	352	60	919
5:00	9	110			8	62				
5:15	16	118			22	72				
5:30	21	112			26	61				
5:45	22	117	68	457	28	80	84	275	152	732
6:00	33	105			29	63				
6:15	37	86			28	76				
6:30	40	77			23	61				
6:45	39	57	149	325	46	38	126	238	275	563
7:00	57	55			63	35				
7:15	73	58			76	41				
7:30	139	53			115	37				
7:45	98	41	367	207	170	43	424	156	791	363
8:00	164	49			119	36				
8:15	96	39			143	32				
8:30	58	39			113	34				
8:45	77	33	395	160	145	27	520	129	915	289
9:00	106	29			78	28				
9:15	56	32			53	21				
9:30	62	30			52	25				
9:45	49	23	273	114	53	23	236	97	509	211
10:00	54	30			42	16				
10:15	45	21			56	24				
10:30	42	13			44	8				
10:45	66	23	207	87	32	11	174	59	381	146
11:00	57	10			46	13				
11:15	58	11			45	10				
11:30	53	7			45	5				
11:45	51	20	219	48	52	5	188	33	407	81
Totals	1781	3357			1843	2610				
Combined Totals		5138				4453				
ADT										9591
AM Peak Hour	730	AM			730	AM				
Volume	497				547					
P.H.F.	0.758				0.804					
PM Peak Hour		415	PM			215	PM			
Volume		577				459				
P.H.F.		0.744				0.675				
Percentage	34.7%	65.3%			41.4%	58.6%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

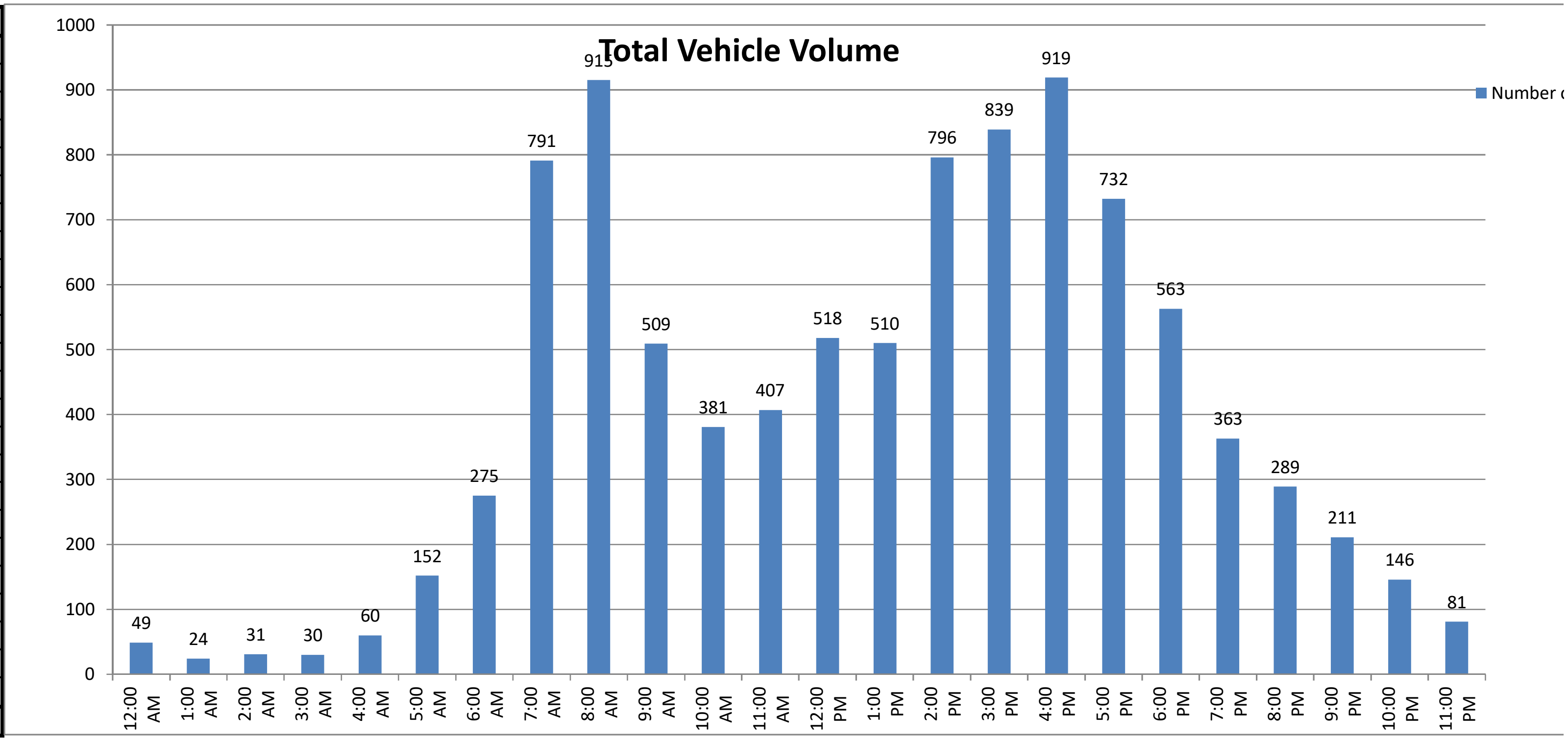
24 Hour Volume Plot

Ocean View Hills Parkway

B/ Sea Fire Point - Hidden Trails Road

1/18/2018

Start Time	1/18/2018
12:00 AM	49
1:00 AM	24
2:00 AM	31
3:00 AM	30
4:00 AM	60
5:00 AM	152
6:00 AM	275
7:00 AM	791
8:00 AM	915
9:00 AM	509
10:00 AM	381
11:00 AM	407
12:00 PM	518
1:00 PM	510
2:00 PM	796
3:00 PM	839
4:00 PM	919
5:00 PM	732
6:00 PM	563
7:00 PM	363
8:00 PM	289
9:00 PM	211
10:00 PM	146
11:00 PM	81
Total	9591



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Ocean View Hills Parkway
B/ Hidden Trails Road - Otay Mesa Road

File Name 005
Site Code: 143-18041
24 Hour Directional Volume Count

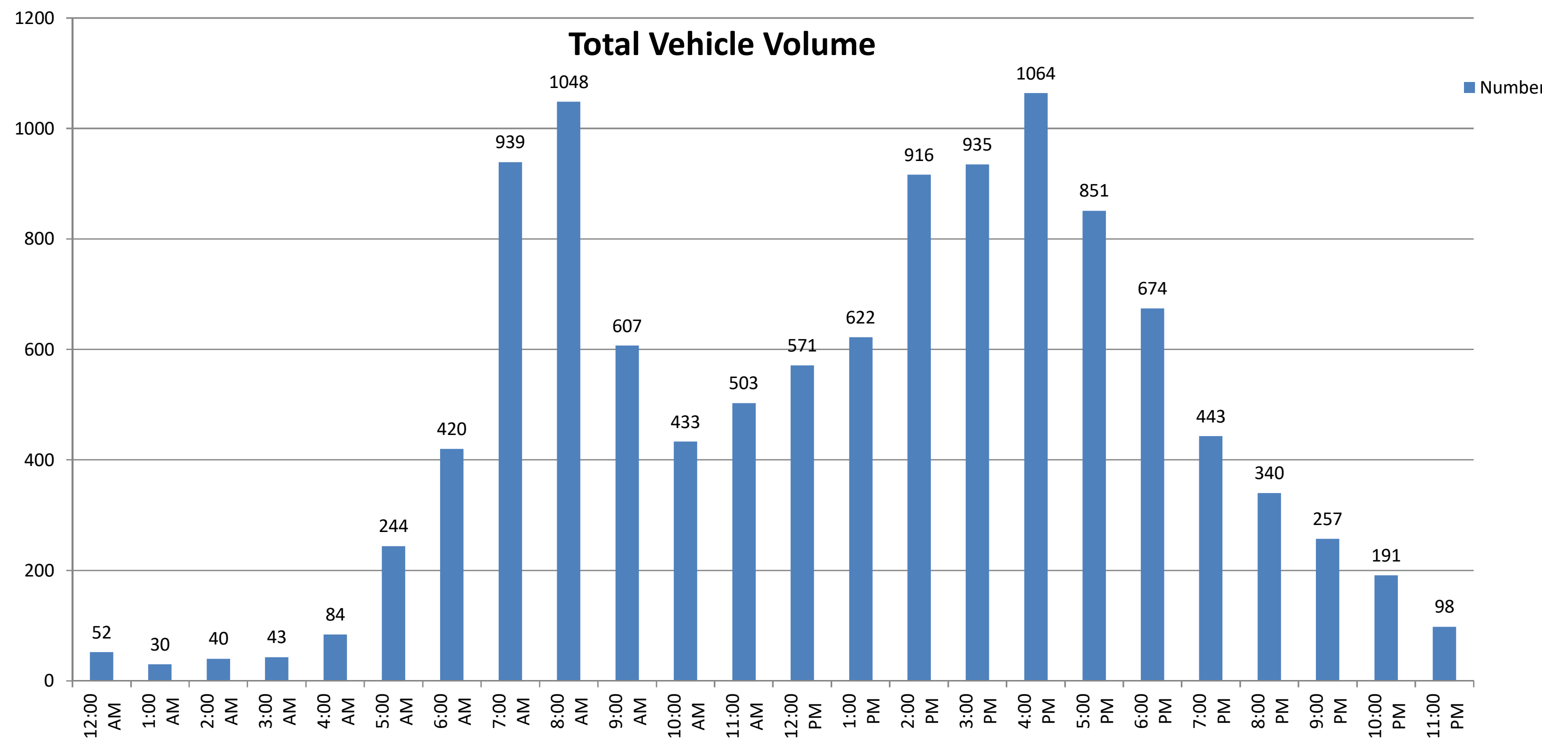
Date:	Northbound				Southbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	13	75			11	62				
12:15	8	85			3	76				
12:30	5	66			5	62				
12:45	6	67	32	293	1	78	20	278	52	571
1:00	6	71			5	68				
1:15	2	82			1	70				
1:30	4	90			5	82				
1:45	2	93	14	336	5	66	16	286	30	622
2:00	12	124			1	67				
2:15	2	119			2	127				
2:30	4	133			4	105				
2:45	8	135	26	511	7	106	14	405	40	916
3:00	7	108			2	182				
3:15	6	104			5	125				
3:30	1	104			4	81				
3:45	7	125	21	441	11	106	22	494	43	935
4:00	4	135			5	116				
4:15	13	227			5	116				
4:30	12	167			14	86				
4:45	12	129	41	658	19	88	43	406	84	1064
5:00	19	134			18	73				
5:15	26	131			40	83				
5:30	26	125			39	67				
5:45	33	138	104	528	43	100	140	323	244	851
6:00	43	119			43	80				
6:15	47	99			48	85				
6:30	56	93			47	68				
6:45	64	77	210	388	72	53	210	286	420	674
7:00	72	76			82	44				
7:15	79	66			95	46				
7:30	160	60			135	46				
7:45	116	56	427	258	200	49	512	185	939	443
8:00	190	55			153	42				
8:15	105	47			160	37				
8:30	67	49			121	36				
8:45	88	41	450	192	164	33	598	148	1048	340
9:00	117	33			114	33				
9:15	61	39			57	26				
9:30	75	38			64	30				
9:45	56	28	309	138	63	30	298	119	607	257
10:00	55	40			54	17				
10:15	55	31			57	26				
10:30	47	26			56	14				
10:45	73	24	230	121	36	13	203	70	433	191
11:00	66	13			55	12				
11:15	69	13			63	10				
11:30	63	9			56	6				
11:45	58	27	256	62	73	8	247	36	503	98
Totals	2120	3926			2323	3036				
Combined Totals		6046				5359				
ADT										11405
AM Peak Hour	730	AM			730	AM				
Volume	571				648					
P.H.F.	0.751				0.810					
PM Peak Hour		400	PM			215	PM			
Volume		658				520				
P.H.F.		0.725				0.714				
Percentage	35.1%	64.9%			43.3%	56.7%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

24 Hour Volume Plot

Ocean View Hills Parkway
B/ Hidden Trails Road - Otay Mesa Road
1/18/2018

Start Time	1/18/2018
12:00 AM	52
1:00 AM	30
2:00 AM	40
3:00 AM	43
4:00 AM	84
5:00 AM	244
6:00 AM	420
7:00 AM	939
8:00 AM	1048
9:00 AM	607
10:00 AM	433
11:00 AM	503
12:00 PM	571
1:00 PM	622
2:00 PM	916
3:00 PM	935
4:00 PM	1064
5:00 PM	851
6:00 PM	674
7:00 PM	443
8:00 PM	340
9:00 PM	257
10:00 PM	191
11:00 PM	98
Total	11405



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Otay Mesa Road
B/ Ocean View Hills Parkway - Emerald Crest Court

File Name 009
Site Code: 143-18041
24 Hour Directional Volume Count

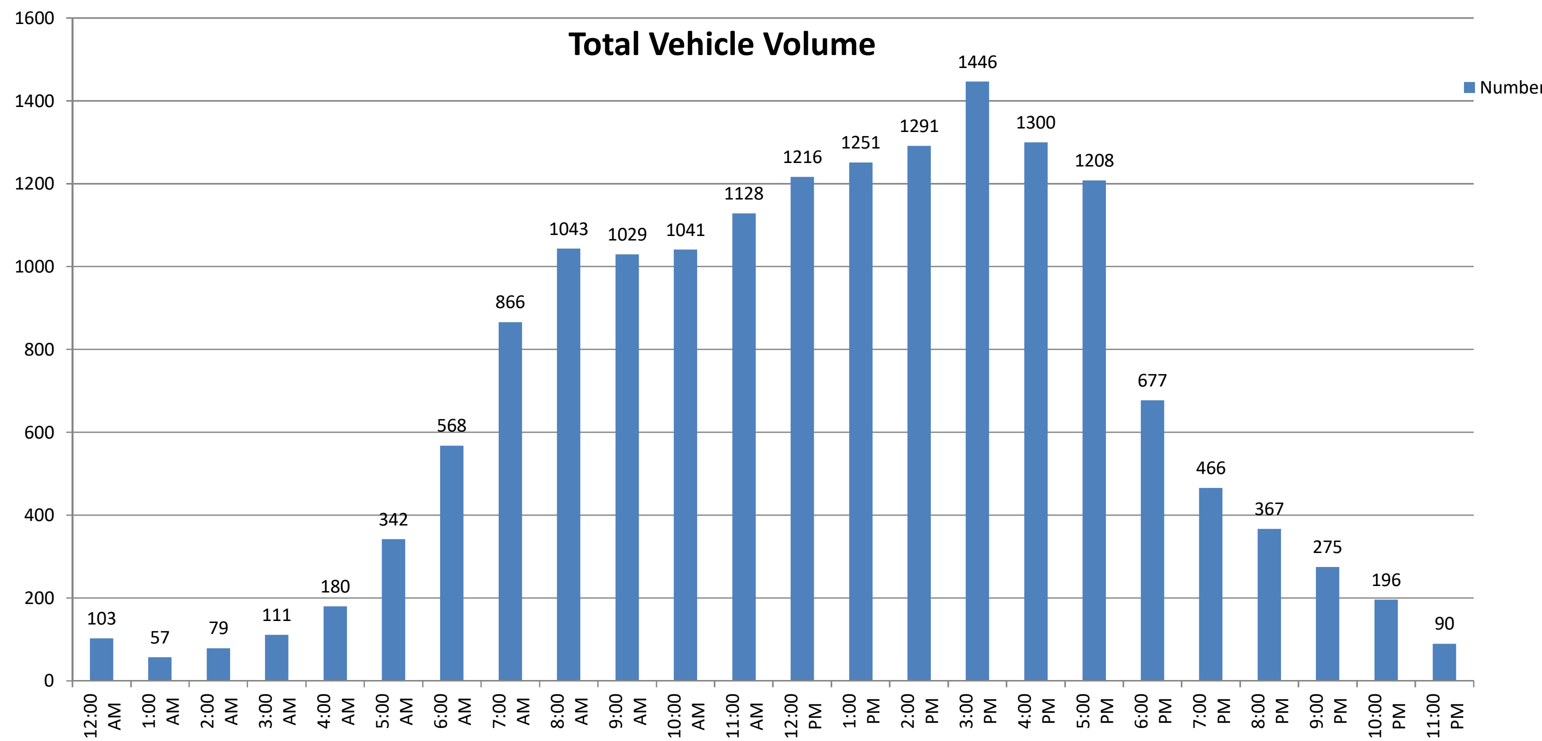
Date:	Eastbound				Westbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	14	135			15	185				
12:15	9	124			26	167				
12:30	10	150			13	159				
12:45	1	152	34	561	15	144	69	655	103	1216
1:00	7	149			4	165				
1:15	11	172			6	153				
1:30	6	160			6	177				
1:45	8	124	32	605	9	151	25	646	57	1251
2:00	8	165			18	187				
2:15	13	134			12	167				
2:30	9	126			7	181				
2:45	7	144	37	569	5	187	42	722	79	1291
3:00	20	128			12	207				
3:15	11	166			14	193				
3:30	6	163			13	244				
3:45	19	117	56	574	16	228	55	872	111	1446
4:00	13	126			14	210				
4:15	17	127			34	179				
4:30	21	114			24	221				
4:45	29	107	80	474	28	216	100	826	180	1300
5:00	21	87			39	265				
5:15	33	82			42	254				
5:30	37	69			55	211				
5:45	62	61	153	299	53	179	189	909	342	1208
6:00	64	67			62	136				
6:15	65	59			61	128				
6:30	75	69			63	116				
6:45	109	38	313	233	69	64	255	444	568	677
7:00	153	49			67	74				
7:15	94	36			96	85				
7:30	122	40			71	62				
7:45	176	53	545	178	87	67	321	288	866	466
8:00	210	40			79	63				
8:15	168	38			102	51				
8:30	150	38			94	57				
8:45	132	31	660	147	108	49	383	220	1043	367
9:00	136	26			98	43				
9:15	129	41			146	40				
9:30	131	25			129	36				
9:45	124	32	520	124	136	32	509	151	1029	275
10:00	124	19			134	36				
10:15	123	21			135	32				
10:30	143	24			118	25				
10:45	124	11	514	75	140	28	527	121	1041	196
11:00	110	13			131	13				
11:15	126	7			152	6				
11:30	143	16			156	6				
11:45	145	15	524	51	165	14	604	39	1128	90
Totals	3468	3890			3079	5893				
Combined Totals		7358				8972				
ADT										16330
AM Peak Hour	745	AM			1100	AM				
Volume	704				604					
P.H.F.	0.838				0.915					
PM Peak Hour		1245	PM			430	PM			
Volume		633				956				
P.H.F.		0.920				0.902				
Percentage	47.1%	52.9%			34.3%	65.7%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

24 Hour Volume Plot

Otay Mesa Road
B/ Ocean View Hills Parkway - Emerald Crest Court
1/18/2018

Start Time	1/18/2018
12:00 AM	103
1:00 AM	57
2:00 AM	79
3:00 AM	111
4:00 AM	180
5:00 AM	342
6:00 AM	568
7:00 AM	866
8:00 AM	1043
9:00 AM	1029
10:00 AM	1041
11:00 AM	1128
12:00 PM	1216
1:00 PM	1251
2:00 PM	1291
3:00 PM	1446
4:00 PM	1300
5:00 PM	1208
6:00 PM	677
7:00 PM	466
8:00 PM	367
9:00 PM	275
10:00 PM	196
11:00 PM	90
Total	16330



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Otay Mesa Road
B/ Emerald Crest Court - Corporate Center Drive

File Name 010
Site Code: 143-18041
24 Hour Directional Volume Count

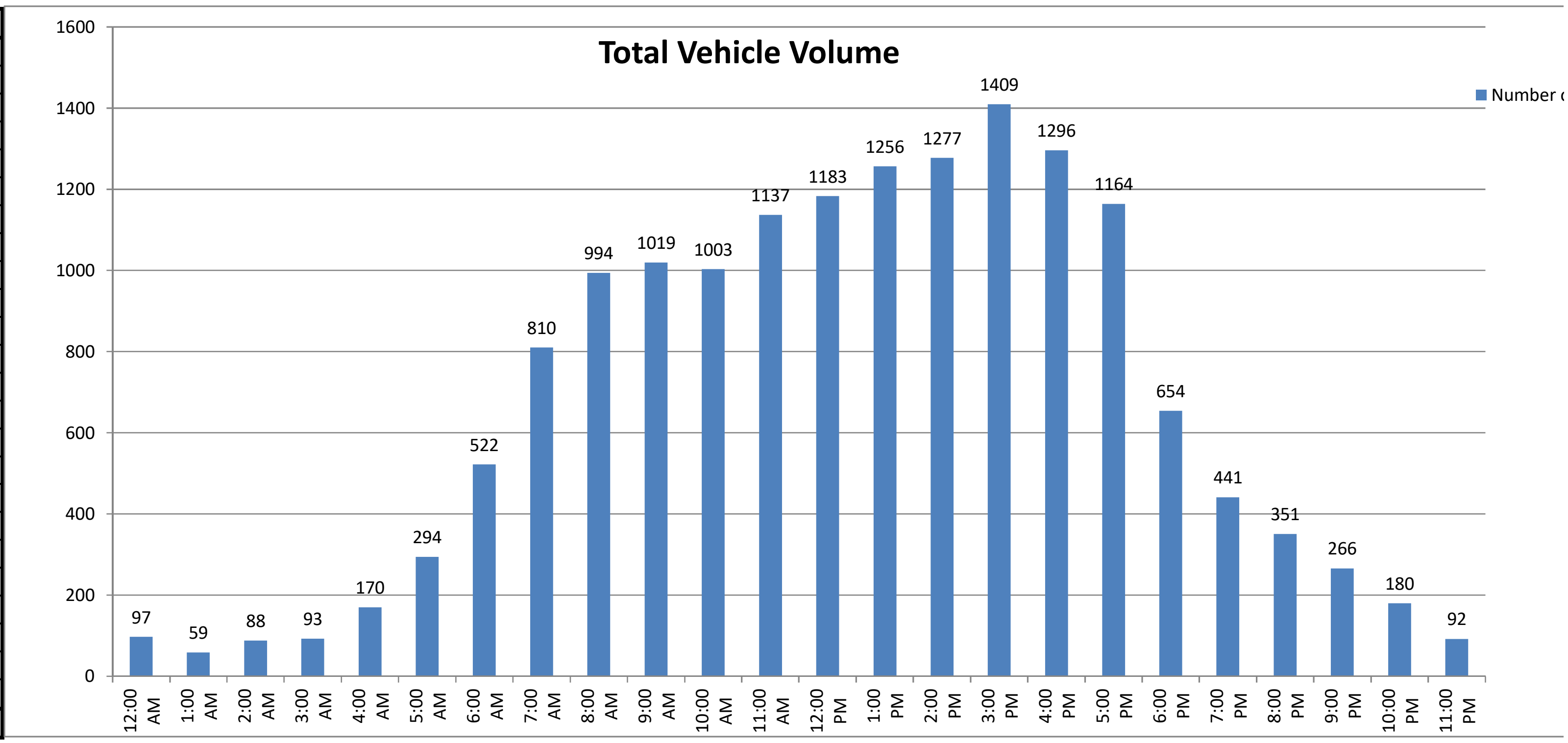
Date:	Eastbound				Westbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	13	126			13	177				
12:15	10	129			25	157				
12:30	7	150			14	147				
12:45	1	151	31	556	14	146	66	627	97	1183
1:00	8	162			5	162				
1:15	11	164			4	144				
1:30	7	159			7	176				
1:45	8	133	34	618	9	156	25	638	59	1256
2:00	7	164			19	173				
2:15	15	130			12	172				
2:30	9	132			5	166				
2:45	17	148	48	574	4	192	40	703	88	1277
3:00	8	140			11	194				
3:15	10	166			15	181				
3:30	8	155			13	261				
3:45	18	112	44	573	10	200	49	836	93	1409
4:00	15	131			14	214				
4:15	19	130			33	187				
4:30	20	111			19	195				
4:45	27	112	81	484	23	216	89	812	170	1296
5:00	19	83			31	269				
5:15	41	81			23	236				
5:30	33	70			36	196				
5:45	71	60	164	294	40	169	130	870	294	1164
6:00	67	65			47	127				
6:15	56	63			43	119				
6:30	87	66			51	115				
6:45	124	38	334	232	47	61	188	422	522	654
7:00	140	49			60	70				
7:15	97	34			66	75				
7:30	137	40			65	50				
7:45	183	57	557	180	62	66	253	261	810	441
8:00	206	36			74	60				
8:15	173	39			93	53				
8:30	156	37			77	43				
8:45	125	32	660	144	90	51	334	207	994	351
9:00	137	29			111	38				
9:15	136	38			133	31				
9:30	126	24			112	36				
9:45	138	38	537	129	126	32	482	137	1019	266
10:00	108	13			138	34				
10:15	130	21			112	34				
10:30	142	26			121	22				
10:45	120	7	500	67	132	23	503	113	1003	180
11:00	114	14			139	10				
11:15	124	7			147	5				
11:30	149	15			157	7				
11:45	145	18	532	54	162	16	605	38	1137	92
Totals	3522	3905			2764	5664				
Combined Totals		7427				8428				
ADT										15855
AM Peak Hour	745	AM			1100	AM				
Volume	718				605					
P.H.F.	0.871				0.934					
PM Peak Hour		1245	PM			445	PM			
Volume		636				917				
P.H.F.		0.970				0.852				
Percentage	47.4%	52.6%			32.8%	67.2%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

24 Hour Volume Plot

Otay Mesa Road
B/ Emerald Crest Court - Corporate Center Drive
1/18/2018

Start Time	1/18/2018
12:00 AM	97
1:00 AM	59
2:00 AM	88
3:00 AM	93
4:00 AM	170
5:00 AM	294
6:00 AM	522
7:00 AM	810
8:00 AM	994
9:00 AM	1019
10:00 AM	1003
11:00 AM	1137
12:00 PM	1183
1:00 PM	1256
2:00 PM	1277
3:00 PM	1409
4:00 PM	1296
5:00 PM	1164
6:00 PM	654
7:00 PM	441
8:00 PM	351
9:00 PM	266
10:00 PM	180
11:00 PM	92
Total	15855



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Otay Mesa Road
B/ Corporate Center Drive - Innovative Drive

File Name 011
Site Code: 143-18041
24 Hour Directional Volume Count

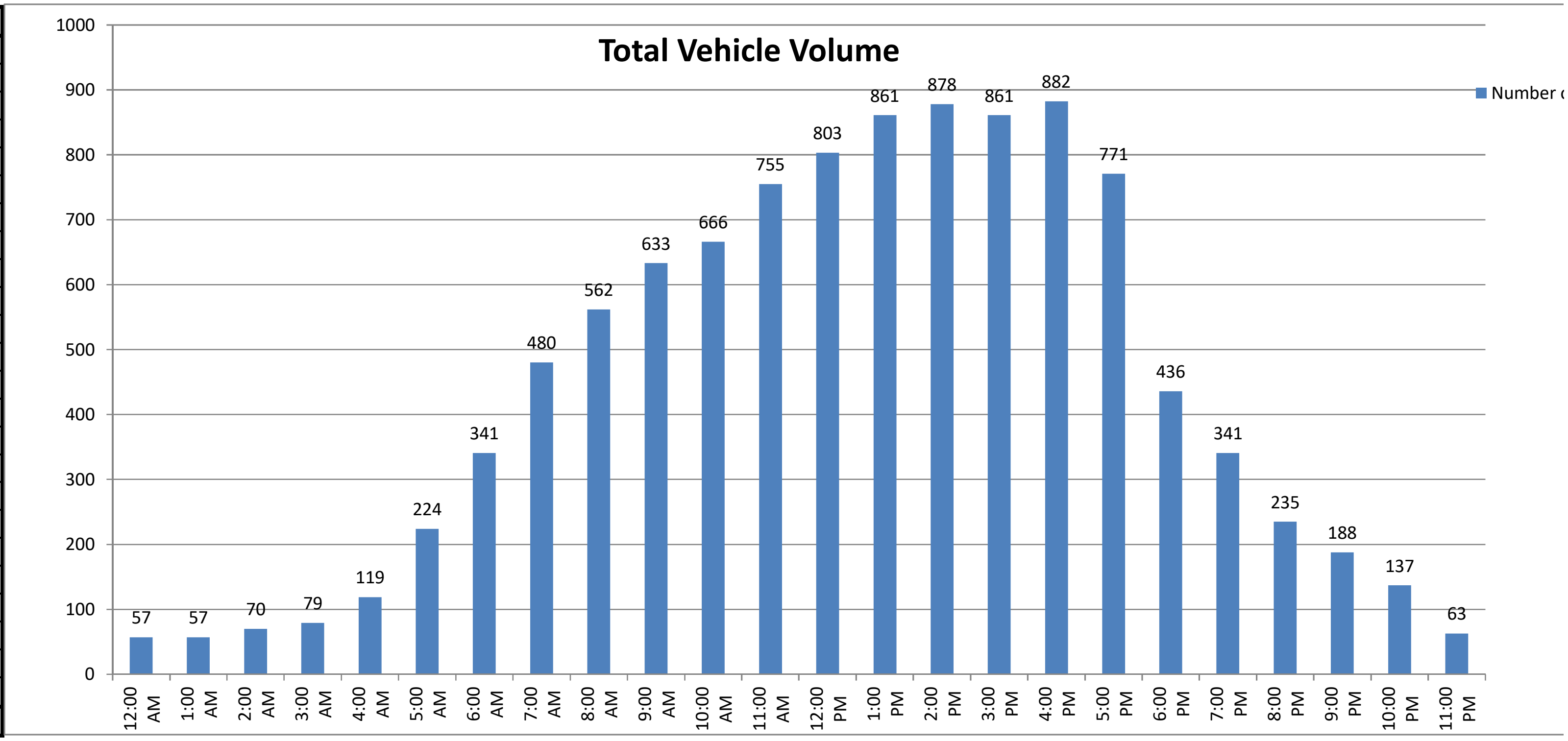
Date:	Eastbound				Westbound					
1/18/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	7	72			7	119				
12:15	10	76			12	112				
12:30	2	92			10	106				
12:45	3	110	22	350	6	116	35	453	57	803
1:00	9	90			3	107				
1:15	7	98			6	121				
1:30	4	107			10	132				
1:45	8	90	28	385	10	116	29	476	57	861
2:00	8	90			14	121				
2:15	11	105			6	113				
2:30	6	85			6	118				
2:45	13	94	38	374	6	152	32	504	70	878
3:00	9	93			9	131				
3:15	3	92			9	120				
3:30	14	85			12	139				
3:45	13	72	39	342	10	129	40	519	79	861
4:00	10	69			17	129				
4:15	11	91			22	143				
4:30	12	85			21	151				
4:45	15	72	48	317	11	142	71	565	119	882
5:00	15	69			24	177				
5:15	21	62			33	156				
5:30	22	50			30	119				
5:45	39	39	97	220	40	99	127	551	224	771
6:00	28	47			38	93				
6:15	40	40			32	81				
6:30	44	44			46	59				
6:45	63	27	175	158	50	45	166	278	341	436
7:00	53	39			54	65				
7:15	53	26			47	55				
7:30	60	37			63	41				
7:45	86	27	252	129	64	51	228	212	480	341
8:00	87	19			65	45				
8:15	74	33			45	35				
8:30	82	17			71	30				
8:45	72	23	315	92	66	33	247	143	562	235
9:00	87	26			91	26				
9:15	83	17			70	30				
9:30	77	25			77	26				
9:45	56	23	303	91	92	15	330	97	633	188
10:00	66	9			93	37				
10:15	87	15			86	23				
10:30	74	15			86	23				
10:45	77	5	304	44	97	10	362	93	666	137
11:00	61	5			90	8				
11:15	83	6			103	3				
11:30	107	11			102	8				
11:45	83	11	334	33	126	11	421	30	755	63
Totals	1955	2535			2088	3921				
Combined Totals		4490				6009				
ADT										10499
AM Peak Hour	1100	AM			1100	AM				
Volume	334				421					
P.H.F.	0.780				0.835					
PM Peak Hour		1245	PM			430	PM			
Volume		405				626				
P.H.F.		0.920				0.884				
Percentage	43.5%	56.5%			34.7%	65.3%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

24 Hour Volume Plot

Otay Mesa Road
B/ Corporate Center Drive - Innovative Drive
1/18/2018

Start Time	1/18/2018
12:00 AM	57
1:00 AM	57
2:00 AM	70
3:00 AM	79
4:00 AM	119
5:00 AM	224
6:00 AM	341
7:00 AM	480
8:00 AM	562
9:00 AM	633
10:00 AM	666
11:00 AM	755
12:00 PM	803
1:00 PM	861
2:00 PM	878
3:00 PM	861
4:00 PM	882
5:00 PM	771
6:00 PM	436
7:00 PM	341
8:00 PM	235
9:00 PM	188
10:00 PM	137
11:00 PM	63
Total	10499



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Otay Mesa Road
B/ Innovative Drive - Heritage Road

File Name 001
Site Code: 143-18999
24 Hour Directional Volume Count

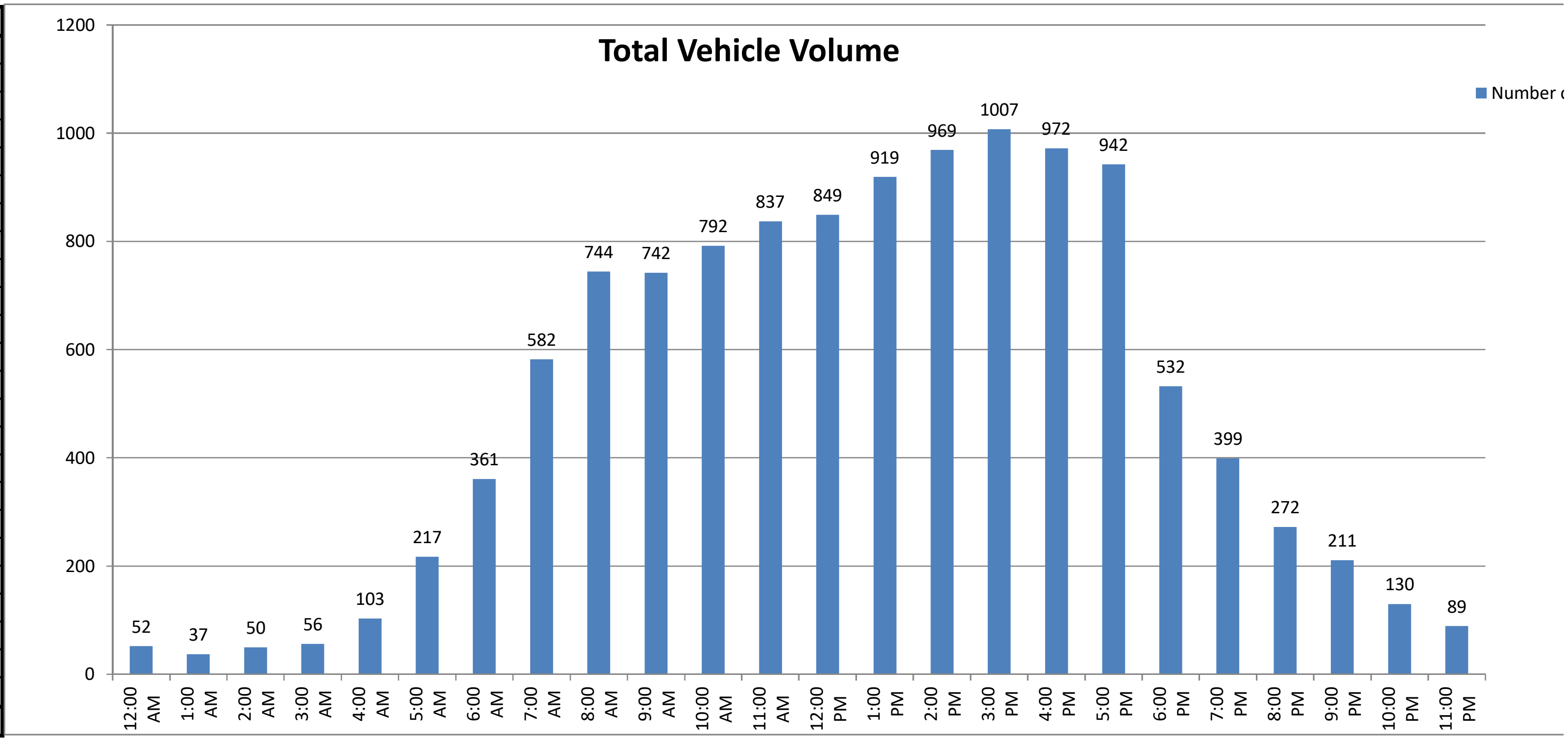
Date:	Eastbound				Westbound					
9/11/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	8	112			4	102				
12:15	11	121			2	90				
12:30	9	120			7	107				
12:45	6	104	34	457	5	93	18	392	52	849
1:00	6	109			4	100				
1:15	6	120			8	123				
1:30	3	151			4	103				
1:45	2	107	17	487	4	106	20	432	37	919
2:00	4	142			4	84				
2:15	6	129			8	114				
2:30	8	133			11	93				
2:45	4	150	22	554	5	124	28	415	50	969
3:00	6	147			6	118				
3:15	6	123			6	109				
3:30	11	141			9	111				
3:45	4	150	27	561	8	108	29	446	56	1007
4:00	11	168			11	97				
4:15	18	136			12	105				
4:30	12	147			9	99				
4:45	15	130	56	581	15	90	47	391	103	972
5:00	31	216			16	92				
5:15	24	169			14	87				
5:30	30	127			27	64				
5:45	30	129	115	641	45	58	102	301	217	942
6:00	37	79			17	60				
6:15	34	90			43	44				
6:30	54	78			56	46				
6:45	53	81	178	328	67	54	183	204	361	532
7:00	65	78			61	43				
7:15	81	61			79	25				
7:30	63	55			45	45				
7:45	60	50	269	244	128	42	313	155	582	399
8:00	86	50			107	31				
8:15	93	33			98	30				
8:30	69	26			109	32				
8:45	79	48	327	157	103	22	417	115	744	272
9:00	72	27			100	33				
9:15	88	32			94	14				
9:30	77	29			94	29				
9:45	118	28	355	116	99	19	387	95	742	211
10:00	96	24			91	16				
10:15	109	17			106	20				
10:30	110	20			87	10				
10:45	106	11	421	72	87	12	371	58	792	130
11:00	96	9			106	15				
11:15	100	10			94	10				
11:30	130	14			97	11				
11:45	97	5	423	38	117	15	414	51	837	89
Totals	2244	4236			2329	3055				
Combined Totals		6480				5384				
ADT										11864
AM Peak Hour	945	AM			745	AM				
Volume	433				442					
P.H.F.	0.917				0.863					
PM Peak Hour		430	PM			245	PM			
Volume		662				462				
P.H.F.		0.766				0.931				
Percentage	34.6%	65.4%			43.3%	56.7%				

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

24 Hour Volume Plot

Otay Mesa Road
B/ Innovative Drive - Heritage Road
9/11/2018

Start Time	9/11/2018
12:00 AM	52
1:00 AM	37
2:00 AM	50
3:00 AM	56
4:00 AM	103
5:00 AM	217
6:00 AM	361
7:00 AM	582
8:00 AM	744
9:00 AM	742
10:00 AM	792
11:00 AM	837
12:00 PM	849
1:00 PM	919
2:00 PM	969
3:00 PM	1007
4:00 PM	972
5:00 PM	942
6:00 PM	532
7:00 PM	399
8:00 PM	272
9:00 PM	211
10:00 PM	130
11:00 PM	89
Total	11864



Volumes represent the combined totals for both directions

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Ocean View Hills Parkway
E/W: Starfish / Westport View

Date: 1/18/2018
Day: WEDNESDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30AM to 8:30 AM

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Starfish / Westport View Eastbound			Starfish / Westport View Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	96	2	11	81	1	6	0	1	7	0	19	224
7:15 AM	0	85	2	6	107	2	5	0	0	9	0	18	234
7:30 AM	1	118	4	7	168	4	7	1	2	17	2	14	345
7:45 AM	0	144	6	9	137	5	14	0	2	24	0	20	361
8:00 AM	0	112	11	10	149	9	15	0	0	20	3	7	336
8:15 AM	1	168	7	16	89	4	24	3	0	7	2	12	333
8:30 AM	0	129	5	17	78	3	12	1	2	12	0	12	271
8:45 AM	0	102	7	20	105	1	7	0	2	12	0	10	266
TOTAL VOLUMES:	2	954	44	96	914	29	90	5	9	108	7	112	2370

AM Peak Hr Begins at: 730 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	2	542	28	42	543	22	60	4	4	68	7	53	1375

PEAK HR FACTOR:	0.813	0.848	0.630	0.727	0.952

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Starfish / Westport View Eastbound			Starfish / Westport View Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	3	0	0	0	0	0	0	0	0	0	0	3
TOTAL VOLUMES:	0	4	0	0	3	0	0	0	0	0	0	0	7

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	1	0	0	1	0	0	0	0	0	0	0	2

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Starfish / Westport View East Leg	Starfish / Westport View West Leg	TOTAL
7:00 AM	0	0	0	2	2
7:15 AM	0	0	0	0	0
7:30 AM	0	1	0	1	2
7:45 AM	0	0	0	0	0
8:00 AM	0	0	1	3	4
8:15 AM	1	0	0	3	4
8:30 AM	0	2	0	0	2
8:45 AM	0	1	1	1	3
TOTAL VOLUMES:	1	4	2	10	17

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	1	1	1	7	10

PO Box 1178
Corona, CA 92880
951-268-6268

Location:	San Diego		Date: 1/18/2018
N/S:	Ocean View Hills Parkway		Day: WEDNESDAY
E/W:	Starfish / Westport View		Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:15 PM to 5:15 PM**

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Starfish / Westport View Eastbound			Starfish / Westport View Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	103	7	27	116	5	7	0	1	3	1	5	275
4:15 PM	1	180	8	33	129	5	6	1	1	0	0	10	374
4:30 PM	0	136	5	47	119	5	2	0	1	6	0	14	335
4:45 PM	2	137	6	36	115	3	3	0	2	4	0	9	317
5:00 PM	1	110	6	31	108	7	3	0	0	3	0	20	289
5:15 PM	0	118	8	36	104	5	4	0	0	7	0	14	296
5:30 PM	0	112	9	38	89	4	8	0	0	2	1	15	278
5:45 PM	0	126	6	27	88	4	3	0	1	4	0	18	277
TOTAL VOLUMES:	4	1022	55	275	868	38	36	1	6	29	2	105	2441

PM Peak Hr Begins at: 415 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	4	563	25	147	471	20	14	1	4	13	0	53	1315

	Northbound	Southbound	Eastbound	Westbound	TOTAL
PEAK HR FACTOR:	0.783	0.933	0.594	0.717	0.879

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Starfish / Westport View Eastbound			Starfish / Westport View Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Starfish / Westport View East Leg	Starfish / Westport View West Leg	TOTAL
4:00 PM	0	0	0	1	1
4:15 PM	0	0	1	2	3
4:30 PM	0	0	1	1	2
4:45 PM	0	0	2	5	7
5:00 PM	0	0	0	0	0
5:15 PM	0	1	1	2	4
5:30 PM	1	0	0	0	1
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	1	1	5	11	18

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	4	8	12

Counts unlimited
PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Ocean View Hills Parkway
E/W: Sea Drift Way

Date: 1/18/2018
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30AM to 8:30 AM

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Sea Drift Way Eastbound			Sea Drift Way Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	2	70	0	0	90	5	12	0	7	0	0	0	186
7:15 AM	1	75	0	0	133	8	20	0	6	0	0	0	243
7:30 AM	0	126	0	0	158	21	20	0	8	0	0	0	333
7:45 AM	3	121	0	0	145	28	16	0	3	0	0	0	316
8:00 AM	4	118	0	0	122	35	20	0	7	0	0	0	306
8:15 AM	1	155	0	0	69	6	26	0	8	0	0	0	265
8:30 AM	1	104	0	0	99	8	19	0	5	0	0	0	236
8:45 AM	2	103	0	0	113	4	12	0	11	0	0	0	245
TOTAL VOLUMES:	14	872	0	0	929	115	145	0	55	0	0	0	2130

AM Peak Hr Begins at: 730 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	8	520	0	0	494	90	82	0	26	0	0	0	1220

PEAK HR FACTOR:	0.846	0.816	0.794	0.000	0.916

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Sea Drift Way Eastbound			Sea Drift Way Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	2
TOTAL VOLUMES:	0	3	0	0	3	0	0	0	0	0	0	0	6

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	1	0	0	1	0	0	0	0	0	0	0	2

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Sea Drift Way East Leg	Sea Drift Way West Leg	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	2	2
7:45 AM	0	0	2	3	5
8:00 AM	0	0	1	1	2
8:15 AM	0	0	0	2	2
8:30 AM	0	0	0	0	0
8:45 AM	0	0	3	4	7
TOTAL VOLUMES:	0	0	6	12	18

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	3	8	11

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Ocean View Hills Parkway
E/W: Sea Drift Way

Date: 1/18/2018
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Sea Drift Way Eastbound			Sea Drift Way Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	5	112	0	0	112	12	9	0	11	0	0	0	261
4:15 PM	8	183	0	0	114	11	6	0	5	0	0	0	327
4:30 PM	6	128	0	0	117	13	10	0	4	0	0	0	278
4:45 PM	2	125	0	0	104	14	12	0	2	0	0	0	259
5:00 PM	7	115	0	0	93	12	8	0	2	0	0	0	237
5:15 PM	7	116	0	0	100	13	7	0	1	0	0	0	244
5:30 PM	9	113	0	0	79	14	8	0	1	0	0	0	224
5:45 PM	7	132	0	0	89	10	5	0	3	0	0	0	246
TOTAL VOLUMES:	51	1024	0	0	808	99	65	0	29	0	0	0	2076

PM Peak Hr Begins at: 400 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	21	548	0	0	447	50	37	0	22	0	0	0	1125

	Northbound	Southbound	Eastbound	Westbound	TOTAL
PEAK HR FACTOR:	0.745	0.956	0.738	0.000	0.860

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Sea Drift Way Eastbound			Sea Drift Way Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	3	0	0	0	0	0	0	0	0	0	0	3

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	1	0	0	0	0	0	0	0	0	0	0	1

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Sea Drift Way East Leg	Sea Drift Way West Leg	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	1	4	5
4:30 PM	0	0	3	3	6
4:45 PM	0	0	0	1	1
5:00 PM	0	0	2	2	4
5:15 PM	0	0	0	2	2
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	6	12	18

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	4	8	12

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Ocean View Hills Parkway
E/W: Del Sol / Breakers

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **7:00 AM to 9:00 AM**
Peak Hour: **7:30AM to 8:30 AM**

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Del Sol / Breakers Eastbound			Del Sol / Breakers Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	27	38	0	2	38	57	27	0	26	1	0	10	226
7:15 AM	62	29	0	1	45	91	37	1	51	1	10	10	338
7:30 AM	107	43	0	5	47	109	70	7	114	2	11	11	526
7:45 AM	64	44	4	3	65	81	76	3	78	1	6	5	430
8:00 AM	119	54	7	5	56	70	67	6	77	0	14	6	481
8:15 AM	28	44	2	5	49	17	92	6	87	0	5	11	346
8:30 AM	11	64	0	5	86	19	39	2	28	1	0	9	264
8:45 AM	11	74	1	5	107	14	21	0	37	2	0	6	278
TOTAL VOLUMES:	429	390	14	31	493	458	429	25	498	8	46	68	2889

AM Peak Hr Begins at: 730 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	318	185	13	18	217	277	305	22	356	3	36	33	1783

PEAK HR FACTOR:	0.717	0.795	0.894	0.750	0.847

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Del Sol / Breakers Eastbound			Del Sol / Breakers Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	3
8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	1	0	0	2	0	0	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	2	0	0	0	0	0	0	1	0	0	0	3
TOTAL VOLUMES:	0	3	0	0	2	1	0	0	3	0	3	0	12

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	1	0	0	0	1	0	0	2	0	3	0	7

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Del Sol / Breakers East Leg	Del Sol / Breakers West Leg	TOTAL
7:00 AM	0	1	0	0	1
7:15 AM	0	8	0	0	8
7:30 AM	1	8	0	1	10
7:45 AM	0	16	2	2	20
8:00 AM	0	5	0	2	7
8:15 AM	0	6	2	2	10
8:30 AM	0	3	0	2	5
8:45 AM	0	0	3	1	4
TOTAL VOLUMES:	1	47	7	10	65

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	1	35	4	7	47

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Ocean View Hills Parkway
E/W: Del Sol / Breakers

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:00 PM to 5:00 PM**

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Del Sol / Breakers Eastbound			Del Sol / Breakers Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	21	97	4	9	91	33	23	1	15	1	0	4	299
4:15 PM	45	155	4	10	66	42	32	0	25	0	1	3	383
4:30 PM	28	114	2	7	70	42	18	0	19	1	1	4	306
4:45 PM	21	80	1	9	56	36	26	1	18	2	1	9	260
5:00 PM	28	98	3	4	57	35	27	1	23	0	0	6	282
5:15 PM	25	87	4	20	47	32	24	0	13	1	0	7	260
5:30 PM	31	88	7	5	37	41	39	0	37	2	4	4	295
5:45 PM	31	71	0	7	54	31	52	5	33	0	1	2	287
TOTAL VOLUMES:	230	790	25	71	478	292	241	8	183	7	8	39	2372

PM Peak Hr Begins at: 400 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	115	446	11	35	283	153	99	2	77	4	3	20	1248

PEAK HR FACTOR:	0.701	0.885	0.781	0.563	0.815

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Del Sol / Breakers Eastbound			Del Sol / Breakers Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	1	2	0	0	0	0	0	0	0	0	0	0	3

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	1	0	0	0	0	0	0	0	0	0	0	1

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Del Sol / Breakers East Leg	Del Sol / Breakers West Leg	TOTAL
4:00 PM	0	2	0	2	4
4:15 PM	0	1	4	6	11
4:30 PM	0	3	5	7	15
4:45 PM	0	1	1	0	2
5:00 PM	0	0	2	0	2
5:15 PM	0	0	0	3	3
5:30 PM	0	1	0	1	2
5:45 PM	0	2	0	0	2
TOTAL VOLUMES:	0	10	12	19	41

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	7	10	15	32

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Ocean View Hills Parkway
E/W: Sea Fire Point

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30AM to 8:30 AM

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Sea Fire Point Eastbound			Sea Fire Point Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	2	53	0	3	60	5	1	0	0	0	0	10	134
7:15 AM	2	95	2	1	96	1	0	0	0	4	0	11	212
7:30 AM	1	127	0	8	148	2	1	0	1	4	0	10	302
7:45 AM	0	118	3	3	142	2	0	0	2	0	0	13	283
8:00 AM	2	152	3	5	124	0	2	0	1	3	0	14	306
8:15 AM	0	63	0	10	132	0	0	0	0	3	0	5	213
8:30 AM	2	64	2	3	109	1	1	0	1	5	0	8	196
8:45 AM	1	85	2	5	139	0	0	0	2	6	0	2	242
TOTAL VOLUMES:	10	757	12	38	950	11	5	0	7	25	0	73	1888

AM Peak Hr Begins at: 730 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	3	460	6	26	546	4	3	0	4	10	0	42	1104

	Northbound	Southbound	Eastbound	Westbound	TOTAL
PEAK HR FACTOR:	0.747	0.911	0.583	0.765	0.902

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Sea Fire Point Eastbound			Sea Fire Point Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
7:15 AM	0	3	0	0	0	0	0	0	0	0	0	0	3
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	3	0	0	0	0	0	0	0	0	0	0	3
8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	3	0	0	0	0	0	0	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	2	0	0	2	0	0	0	0	0	0	0	4
TOTAL VOLUMES:	0	9	0	0	7	0	0	0	0	0	0	0	16

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	4	0	0	3	0	0	0	0	0	0	0	7

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Sea Fire Point East Leg	Sea Fire Point West Leg	TOTAL
7:00 AM	0	0	0	2	2
7:15 AM	0	0	4	17	21
7:30 AM	0	1	1	7	9
7:45 AM	0	1	8	4	13
8:00 AM	0	0	1	5	6
8:15 AM	0	2	7	6	15
8:30 AM	0	0	2	7	9
8:45 AM	0	0	3	3	6
TOTAL VOLUMES:	0	4	26	51	81

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	4	17	22	43

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Location: San Diego
N/S: Ocean View Hills Parkway
E/W: Sea Fire Point

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Sea Fire Point Eastbound			Sea Fire Point Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	1	115	8	8	96	0	1	0	1	1	0	10	241
4:15 PM	0	203	9	10	82	0	0	0	2	7	0	5	318
4:30 PM	0	139	0	16	76	0	1	0	1	1	0	8	242
4:45 PM	0	102	4	11	67	0	1	0	1	4	0	5	195
5:00 PM	1	117	5	7	71	0	0	0	0	2	0	7	210
5:15 PM	0	104	4	6	55	0	1	0	1	1	0	10	182
5:30 PM	0	122	4	9	69	0	0	0	0	2	0	7	213
5:45 PM	0	101	0	15	68	0	0	0	0	7	0	7	198
TOTAL VOLUMES:	2	1003	34	82	584	0	4	0	6	25	0	59	1799

PM Peak Hr Begins at: 400 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	1	559	21	45	321	0	3	0	5	13	0	28	996

PEAK HR FACTOR:	0.685	0.880	1.000	0.854	0.783

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Sea Fire Point Eastbound			Sea Fire Point Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	3	0	0	0	0	0	0	0	0	0	0	3

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	1	0	0	0	0	0	0	0	0	0	0	1

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Sea Fire Point East Leg	Sea Fire Point West Leg	TOTAL
4:00 PM	0	0	1	5	6
4:15 PM	1	2	3	13	19
4:30 PM	0	1	6	11	18
4:45 PM	0	0	3	0	3
5:00 PM	0	0	4	3	7
5:15 PM	0	0	0	1	1
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	1	3	17	33	54

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	1	3	13	29	46

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951-268-6268

Location: San Diego
N/S: Ocean View Hills Parkway
E/W: Hidden Trails Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **7:00 AM to 9:00 AM**
Peak Hour: **7:15 AM to 8:15 AM**

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Hidden Trails Road Eastbound			Hidden Trails Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	13	59	2	0	61	0	0	0	0	4	0	0	139
7:15 AM	13	95	2	1	92	0	0	0	0	17	0	4	224
7:30 AM	10	124	3	2	150	0	0	0	0	7	0	3	299
7:45 AM	17	111	2	1	145	0	0	0	0	21	0	1	298
8:00 AM	14	157	7	1	115	0	0	0	0	6	0	1	301
8:15 AM	9	58	1	0	143	0	0	0	0	6	0	0	217
8:30 AM	11	71	2	3	116	0	0	0	0	9	0	0	212
8:45 AM	11	84	6	0	145	0	0	0	0	13	0	2	261
TOTAL VOLUMES:	98	759	25	8	967	0	0	0	0	83	0	11	1951

AM Peak Hr Begins at: 715 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	54	487	14	5	502	0	0	0	0	51	0	9	1122

	Northbound	Southbound	Eastbound	Westbound	TOTAL
PEAK HR FACTOR:	0.779	0.834	0.000	0.682	0.932

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Hidden Trails Road Eastbound			Hidden Trails Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	1	0	0	0	0	0	2	1	4
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	4	0	0	0	0	0	0	0	0	0	0	4
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	2	0	0	0	1	0	0	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	5	0	0	2	0	0	0	0	0	0	0	7
TOTAL VOLUMES:	0	9	0	0	5	0	0	0	1	0	2	1	18

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	4	0	0	1	0	0	0	0	0	2	1	8

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Hidden Trails Road East Leg	Hidden Trails Road West Leg	TOTAL
7:00 AM	0	3	1	0	4
7:15 AM	0	4	4	0	8
7:30 AM	1	8	5	0	14
7:45 AM	3	1	11	0	15
8:00 AM	1	1	0	0	2
8:15 AM	3	1	0	0	4
8:30 AM	0	2	7	0	9
8:45 AM	4	0	0	0	4
TOTAL VOLUMES:	12	20	28	0	60

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	5	14	20	0	39

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951-268-6268

Location:	San Diego	Date:	1/18/18
N/S:	Ocean View Hills Parkway	Day:	THURSDAY
E/W:	Hidden Trails Road	Project #	143-18041

TURNING MOVEMENT COUNT

Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Hidden Trails Road Eastbound			Hidden Trails Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	14	120	9	2	89	0	0	0	0	11	0	2	247
4:15 PM	8	210	13	3	94	0	0	0	0	2	0	0	330
4:30 PM	7	137	17	1	78	0	0	0	0	4	0	1	245
4:45 PM	4	99	9	2	70	0	0	0	0	10	0	6	200
5:00 PM	9	126	11	1	73	0	0	0	0	1	0	0	221
5:15 PM	6	107	8	2	56	0	0	0	0	5	0	1	185
5:30 PM	8	115	6	1	69	0	0	0	0	5	0	3	207
5:45 PM	8	101	14	3	73	0	0	0	0	7	0	1	207
TOTAL VOLUMES:	64	1015	87	15	602	0	0	0	0	45	0	14	1842

PM Peak Hr Begins at: 400 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	33	566	48	8	331	0	0	0	0	27	0	9	1022

PEAK HR FACTOR:	0.700	0.874	0.000	0.563	0.774

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Hidden Trails Road Eastbound			Hidden Trails Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	3	0	0	0	0	0	0	0	0	0	0	3

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	1	0	0	0	0	0	0	0	0	0	0	1

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Hidden Trails Road East Leg	Hidden Trails Road West Leg	TOTAL
4:00 PM	0	2	1	0	3
4:15 PM	1	6	7	0	14
4:30 PM	0	0	1	0	1
4:45 PM	0	0	2	0	2
5:00 PM	0	0	1	0	1
5:15 PM	1	0	1	0	2
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	2	8	13	0	23

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	1	8	11	0	20

PO Box 1178
Corona, CA 92880
951-268-6268

Location:	San Diego		Date: 1/18/18
N/S:	Ocean View Hills Parkway		Day: THURSDAY
E/W:	Otay Mesa Road		Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **7:00 AM to 9:00 AM**
Peak Hour: **7:30AM to 8:30 AM**

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	3	40	94	18	69	0	0	0	0	57	0	15	296
7:15 AM	0	53	92	28	88	1	1	0	0	70	0	12	345
7:30 AM	4	100	111	24	132	0	0	0	0	60	0	17	448
7:45 AM	0	73	155	39	137	0	0	0	2	64	1	16	487
8:00 AM	0	121	152	44	105	0	0	0	3	63	0	21	509
8:15 AM	1	53	135	45	113	1	0	0	0	70	0	13	431
8:30 AM	2	49	107	35	90	0	0	0	1	66	0	19	369
8:45 AM	6	64	104	31	131	0	0	1	5	79	1	21	443
TOTAL VOLUMES:	16	553	950	264	865	2	1	1	11	529	2	134	3328

AM Peak Hr Begins at: 730 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	5	347	553	152	487	1	0	0	5	257	1	67	1875

PEAK HR FACTOR:	0.829	0.909	0.417	0.967	0.921

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
7:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	1
8:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	1	0	0	0	0	0	0	1	2
8:45 AM	0	1	0	0	1	1	0	0	0	0	0	1	4
TOTAL VOLUMES:	0	1	1	0	4	1	0	0	0	0	0	3	10

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	1	0	1	0	0	0	0	0	0	1	3

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Otay Mesa Road East Leg	Otay Mesa Road West Leg	TOTAL
7:00 AM	0	0	0	3	3
7:15 AM	0	0	0	2	2
7:30 AM	3	0	0	6	9
7:45 AM	1	0	0	1	2
8:00 AM	0	0	0	2	2
8:15 AM	3	0	0	6	9
8:30 AM	4	0	0	17	21
8:45 AM	2	0	0	14	16
TOTAL VOLUMES:	13	0	0	51	64

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	7	0	0	15	22

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Ocean View Hills Parkway
E/W: Otay Mesa Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:15 PM to 5:15 PM**

Vehicle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	1	102	95	28	86	0	0	0	1	140	0	52	505
4:15 PM	13	188	89	38	64	0	2	0	5	144	1	40	584
4:30 PM	9	127	80	23	61	0	0	0	8	159	3	44	514
4:45 PM	0	79	83	30	53	0	0	0	0	177	0	55	477
5:00 PM	0	92	59	33	50	0	0	0	3	217	3	59	516
5:15 PM	2	85	61	23	43	0	0	0	4	174	2	51	445
5:30 PM	0	84	49	35	39	0	0	0	3	141	0	51	402
5:45 PM	2	94	45	20	68	0	0	0	1	133	1	35	399
TOTAL VOLUMES:	27	851	561	230	464	0	2	0	25	1285	10	387	3842

PM Peak Hr Begins at: 415 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	22	486	311	124	228	0	2	0	16	697	7	198	2091

	Northbound	Southbound	Eastbound	Westbound	TOTAL
PEAK HR FACTOR:	0.706	0.863	0.563	0.808	0.895

Bicycle Counts

	Ocean View Hills Parkway Northbound			Ocean View Hills Parkway Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	0	0	0	0	0	0	0	0	0	1	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	1	2	0	0	0	0	0	0	0	0	0	1	4

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	2	0	0	0	0	0	0	0	0	0	0	2

Pedestrian Counts

	Ocean View Hills Parkway North Leg	Ocean View Hills Parkway South Leg	Otay Mesa Road East Leg	Otay Mesa Road West Leg	TOTAL
4:00 PM	2	1	0	8	11
4:15 PM	22	0	0	50	72
4:30 PM	1	0	0	8	9
4:45 PM	1	0	0	0	1
5:00 PM	0	0	0	3	3
5:15 PM	0	0	0	0	0
5:30 PM	2	0	0	5	7
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	28	1	0	74	103

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	24	0	0	61	85

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Caliente Avenue
E/W: I-905 WB Ramps

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30AM to 8:30 AM

Vehicle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			I-905 WB Ramps Eastbound			I-905 WB Ramps Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	46	112	0	0	17	89	0	0	0	0	0	8	272
7:15 AM	40	161	0	0	25	125	0	0	0	6	0	11	368
7:30 AM	60	201	0	0	62	137	0	0	0	3	0	12	475
7:45 AM	88	212	0	0	67	122	0	0	0	7	0	19	515
8:00 AM	52	241	0	0	52	113	0	0	0	6	0	14	478
8:15 AM	76	158	0	0	65	97	0	0	0	5	0	14	415
8:30 AM	96	150	0	0	83	86	0	0	0	6	0	7	428
8:45 AM	127	178	0	0	115	98	0	0	0	18	0	9	545
TOTAL VOLUMES:	585	1413	0	0	486	867	0	0	0	51	0	94	3496

AM Peak Hr Begins at: 730 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	276	812	0	0	246	469	0	0	0	21	0	59	1883

	Northbound	Southbound	Eastbound	Westbound	TOTAL
PEAK HR FACTOR:	0.907	0.898	0.000	0.769	0.914

Bicycle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			I-905 WB Ramps Eastbound			I-905 WB Ramps Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
7:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
8:45 AM	0	1	0	0	2	0	0	0	0	0	0	0	3
TOTAL VOLUMES:	0	2	0	0	4	0	0	0	0	0	0	0	6

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

Pedestrian Counts

	Caliente Avenue North Leg	Caliente Avenue South Leg	I-905 WB Ramps East Leg	I-905 WB Ramps West Leg	TOTAL
7:00 AM	0	0	0	3	3
7:15 AM	0	0	0	7	7
7:30 AM	0	0	0	14	14
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	21	21
8:15 AM	0	0	0	26	26
8:30 AM	0	0	0	32	32
8:45 AM	0	0	0	18	18
TOTAL VOLUMES:	0	0	0	121	121

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	0	61	61

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Caliente Avenue
E/W: I-905 WB Ramps

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Vehicle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			I-905 WB Ramps Eastbound			I-905 WB Ramps Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	124	194	0	0	79	135	0	0	0	14	1	16	563
4:15 PM	156	274	0	0	53	178	0	0	0	5	1	16	683
4:30 PM	120	184	0	0	36	189	0	0	0	8	2	28	567
4:45 PM	58	138	0	0	52	182	0	0	0	9	0	24	463
5:00 PM	54	123	0	0	38	221	0	0	0	6	1	21	464
5:15 PM	39	130	0	0	29	192	0	0	0	4	0	19	413
5:30 PM	37	118	0	0	29	159	0	0	0	9	0	18	370
5:45 PM	49	116	0	0	42	141	0	0	0	6	0	14	368
TOTAL VOLUMES:	637	1277	0	0	358	1397	0	0	0	61	5	156	3891

PM Peak Hr Begins at: 400 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	458	790	0	0	220	684	0	0	0	36	4	84	2276

	Northbound	Southbound	Eastbound	Westbound	TOTAL
PEAK HR FACTOR:	0.726	0.966	0.000	0.816	0.833

Bicycle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			I-905 WB Ramps Eastbound			I-905 WB Ramps Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	1	2	0	0	1	0	0	0	0	0	0	0	4

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	1	0	0	0	0	0	0	0	0	0	0	1

Pedestrian Counts

	Caliente Avenue North Leg	Caliente Avenue South Leg	I-905 WB Ramps East Leg	I-905 WB Ramps West Leg	TOTAL
4:00 PM	0	0	1	91	92
4:15 PM	0	0	0	57	57
4:30 PM	0	0	0	6	6
4:45 PM	0	0	0	14	14
5:00 PM	0	0	0	5	5
5:15 PM	0	0	0	2	2
5:30 PM	0	0	0	9	9
5:45 PM	0	0	0	1	1
TOTAL VOLUMES:	0	0	1	185	186

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	1	168	169

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Caliente Avenue
E/W: I-905 EB Ramps

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00AM to 9:00 AM

Vehicle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			I-905 EB Ramps Eastbound			I-905 EB Ramps Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	48	5	15	14	0	125	0	22	0	0	0	229
7:15 AM	0	55	6	16	10	0	135	0	25	0	0	0	247
7:30 AM	0	81	12	15	21	0	171	0	42	0	0	0	342
7:45 AM	0	89	13	45	48	0	179	0	98	0	0	0	472
8:00 AM	0	132	16	23	40	0	197	0	87	0	0	0	495
8:15 AM	0	83	13	33	47	0	162	1	77	0	0	0	416
8:30 AM	0	112	14	10	52	0	133	0	157	0	0	0	478
8:45 AM	0	184	16	23	125	0	97	0	165	0	0	0	610
TOTAL VOLUMES:	0	784	95	180	357	0	1199	1	673	0	0	0	3289

AM Peak Hr Begins at: 800 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	511	59	89	264	0	589	1	486	0	0	0	1999

PEAK HR FACTOR:	0.713	0.596	0.928	0.000	0.819

Bicycle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			I-905 EB Ramps Eastbound			I-905 EB Ramps Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
8:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	2
TOTAL VOLUMES:	0	2	0	0	3	0	0	0	0	0	0	0	5

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	1	0	0	2	0	0	0	0	0	0	0	3

Pedestrian Counts

	Caliente Avenue North Leg	Caliente Avenue South Leg	I-905 EB Ramps East Leg	I-905 EB Ramps West Leg	TOTAL
7:00 AM	0	0	0	7	7
7:15 AM	0	0	0	7	7
7:30 AM	0	0	0	10	10
7:45 AM	0	0	0	4	4
8:00 AM	0	0	0	15	15
8:15 AM	0	0	0	20	20
8:30 AM	0	0	0	14	14
8:45 AM	0	0	0	33	33
TOTAL VOLUMES:	0	0	0	110	110

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	0	82	82

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Caliente Avenue
E/W: I-905 EB Ramps

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:00 PM to 5:00 PM**

Vehicle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			I-905 EB Ramps Eastbound			I-905 EB Ramps Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	159	11	24	67	0	148	2	126	0	0	0	537
4:15 PM	0	288	43	21	49	0	151	1	96	0	0	0	649
4:30 PM	0	155	16	23	30	0	152	1	52	0	0	0	429
4:45 PM	0	79	6	30	24	0	114	0	48	0	0	0	301
5:00 PM	0	65	3	25	25	0	130	0	45	0	0	0	293
5:15 PM	0	47	3	15	24	0	115	0	45	0	0	0	249
5:30 PM	0	47	2	13	16	0	113	0	50	0	0	0	241
5:45 PM	0	65	3	18	36	0	100	0	68	0	0	0	290
TOTAL VOLUMES:	0	905	87	169	271	0	1023	4	530	0	0	0	2989

PM Peak Hr Begins at: 400 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	681	76	98	170	0	565	4	322	0	0	0	1916

PEAK HR FACTOR:	0.572	0.736	0.807	0.000	0.738

Bicycle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			I-905 EB Ramps Eastbound			I-905 EB Ramps Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	2	0	0	0	0	0	0	0	0	0	0	2

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

Pedestrian Counts

	Caliente Avenue North Leg	Caliente Avenue South Leg	I-905 EB Ramps East Leg	I-905 EB Ramps West Leg	TOTAL
4:00 PM	0	0	0	76	76
4:15 PM	0	0	1	93	94
4:30 PM	0	0	0	5	5
4:45 PM	0	0	0	13	13
5:00 PM	0	0	0	7	7
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	12	12
5:45 PM	0	0	0	3	3
TOTAL VOLUMES:	0	0	1	209	210

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	1	187	188

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Caliente Avenue
E/W: Airway Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00AM to 9:00 AM

Vehicle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			Airway Road Eastbound			Airway Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	2	0	14	5	18	38	0	1	0	0	18	96
7:15 AM	0	2	1	4	7	26	46	1	0	0	1	19	107
7:30 AM	1	10	0	6	15	46	60	0	1	0	0	23	162
7:45 AM	2	33	1	13	55	97	81	2	2	2	0	14	302
8:00 AM	1	31	0	11	42	71	68	0	1	0	0	18	243
8:15 AM	0	32	0	7	46	71	65	0	2	0	0	12	235
8:30 AM	0	41	0	5	71	140	112	0	2	0	1	13	385
8:45 AM	3	91	0	10	118	143	120	1	2	0	0	12	500
TOTAL VOLUMES:	7	242	2	70	359	612	590	4	11	2	2	129	2030

AM Peak Hr Begins at: 800 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	4	195	0	33	277	425	365	1	7	0	1	55	1363

PEAK HR FACTOR:	0.529	0.678	0.758	0.778	0.682

Bicycle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			Airway Road Eastbound			Airway Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	0	1	1	0	0	0	0	0	0	3
TOTAL VOLUMES:	0	1	0	0	2	1	1	0	0	0	0	0	5

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	1	0	0	1	1	0	0	0	0	0	0	3

Pedestrian Counts

	Caliente Avenue North Leg	Caliente Avenue South Leg	Airway Road East Leg	Airway Road West Leg	TOTAL
7:00 AM	0	1	0	2	3
7:15 AM	0	1	0	27	28
7:30 AM	1	2	1	8	12
7:45 AM	0	2	0	23	25
8:00 AM	0	1	0	46	47
8:15 AM	0	1	0	38	39
8:30 AM	0	1	0	29	30
8:45 AM	0	7	0	38	45
TOTAL VOLUMES:	1	16	1	211	229

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	10	0	151	161

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Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Caliente Avenue
E/W: Airway Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:00 PM to 5:00 PM**

Vehicle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			Airway Road Eastbound			Airway Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	89	4	41	90	60	65	2	2	2	1	51	407
4:15 PM	3	158	2	21	55	39	115	2	3	1	1	34	434
4:30 PM	2	44	0	14	14	44	99	1	1	0	0	7	226
4:45 PM	0	17	0	16	12	49	47	0	1	1	0	18	161
5:00 PM	1	11	1	23	5	42	44	0	0	0	0	13	140
5:15 PM	2	9	0	16	7	43	39	1	1	0	0	5	123
5:30 PM	0	4	0	18	1	57	31	1	0	1	1	8	122
5:45 PM	0	6	0	25	4	76	58	0	1	0	1	10	181
TOTAL VOLUMES:	8	338	7	174	188	410	498	7	9	5	4	146	1794

PM Peak Hr Begins at: 400 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	5	308	6	92	171	192	326	5	7	4	2	110	1228

PEAK HR FACTOR:	0.489	0.596	0.704	0.537	0.707

Bicycle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			Airway Road Eastbound			Airway Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	1	0	0	0	0	0	1

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

Pedestrian Counts

	Caliente Avenue North Leg	Caliente Avenue South Leg	Airway Road East Leg	Airway Road West Leg	TOTAL
4:00 PM	1	92	20	132	245
4:15 PM	1	8	1	27	37
4:30 PM	0	7	0	12	19
4:45 PM	0	1	0	5	6
5:00 PM	0	4	2	3	9
5:15 PM	0	0	0	1	1
5:30 PM	0	1	0	3	4
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	2	113	23	183	321

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	2	108	21	176	307

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Emerald Crest
E/W: Otay Mesa Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:00AM to 8:00 AM

Vehicle Counts

	Emerald Crest Northbound			Emerald Crest Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	16	0	0	0	0	0	1	17
7:15 AM	0	0	0	0	0	19	0	0	0	0	0	0	19
7:30 AM	0	0	0	0	0	17	0	0	0	0	0	0	17
7:45 AM	0	0	0	0	0	20	0	0	0	0	0	0	20
8:00 AM	0	0	0	0	0	11	0	0	0	0	0	2	13
8:15 AM	0	0	0	0	0	8	0	0	0	0	0	0	8
8:30 AM	0	0	0	0	0	8	0	0	0	0	0	0	8
8:45 AM	0	0	0	0	0	13	0	0	0	0	0	2	15
TOTAL VOLUMES:	0	0	0	0	0	112	0	0	0	0	0	5	117

AM Peak Hr Begins at: 700 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	72	0	0	0	0	0	1	73

	Northbound	Southbound	Eastbound	Westbound	TOTAL
PEAK HR FACTOR:	0.000	0.900	0.000	0.250	0.913

Bicycle Counts

	Emerald Crest Northbound			Emerald Crest Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	4
TOTAL VOLUMES:	0	0	0	0	0	0	0	1	0	0	4	0	5

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	1	0	0	0	0	1

Pedestrian Counts

	Emerald Crest North Leg	Emerald Crest South Leg	Otay Mesa Road East Leg	Otay Mesa Road West Leg	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	0	0	0

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Emerald Crest
E/W: Otay Mesa Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:30 PM to 5:30 PM**

Vehicle Counts

	Emerald Crest Northbound			Emerald Crest Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	12	0	0	0	0	0	3	15
4:15 PM	0	0	0	0	0	4	0	0	0	0	0	3	7
4:30 PM	0	0	0	0	0	13	0	0	0	0	0	3	16
4:45 PM	0	0	0	0	0	13	0	0	0	0	0	2	15
5:00 PM	0	0	0	0	0	7	0	0	0	0	0	9	16
5:15 PM	0	0	0	0	0	9	0	0	0	0	0	2	11
5:30 PM	0	0	0	0	0	9	0	0	0	0	0	4	13
5:45 PM	0	0	0	0	0	9	0	0	0	0	0	4	13
TOTAL VOLUMES:	0	0	0	0	0	76	0	0	0	0	0	30	106

PM Peak Hr Begins at: 430 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	42	0	0	0	0	0	16	58

PEAK HR FACTOR:	0.000	0.808	0.000	0.444	0.906

Bicycle Counts

	Emerald Crest Northbound			Emerald Crest Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	0	2	0	2

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	0	0	0	1	0	1

Pedestrian Counts

	Emerald Crest North Leg	Emerald Crest South Leg	Otay Mesa Road East Leg	Otay Mesa Road West Leg	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	0	0	0

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Corporate Center Drive
E/W: Otay Mesa Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **7:00 AM to 9:00 AM**
Peak Hour: **7:45 AM to 8:45 AM**

Vehicle Counts

	Corporate Center Drive Northbound			Corporate Center Drive Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	4	0	13	56	55	0	0	46	5	179
7:15 AM	0	0	0	2	0	6	54	55	0	0	48	2	167
7:30 AM	0	0	0	1	0	10	71	69	0	0	54	8	213
7:45 AM	0	0	0	2	0	12	91	87	0	0	50	17	259
8:00 AM	0	0	0	7	0	22	103	87	0	0	51	11	281
8:15 AM	0	0	0	6	0	26	71	73	0	1	45	4	226
8:30 AM	0	0	0	13	0	28	60	73	0	0	51	6	231
8:45 AM	0	0	0	7	0	23	45	76	0	1	69	18	239
TOTAL VOLUMES:	0	0	0	42	0	140	551	575	0	2	414	71	1795

AM Peak Hr Begins at: 745 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	28	0	88	325	320	0	1	197	38	997

	Northbound	Southbound	Eastbound	Westbound	TOTAL
PEAK HR FACTOR:	0.000	0.707	0.849	0.881	0.887

Bicycle Counts

	Corporate Center Drive Northbound			Corporate Center Drive Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	3
TOTAL VOLUMES:	0	0	0	0	0	1	1	0	0	0	3	0	5

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	1	0	0	0	0	0	0	1

Pedestrian Counts

	Corporate Center Drive North Leg	Corporate Center Drive South Leg	Otay Mesa Road East Leg	Otay Mesa Road West Leg	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	1	0	0	0	1
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	1	0	1
8:45 AM	1	0	0	0	1
TOTAL VOLUMES:	2	0	1	0	3

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	1	0	0	0	1

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Corporate Center Drive
E/W: Otay Mesa Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:15 PM to 5:15 PM**

Vehicle Counts

	Corporate Center Drive Northbound			Corporate Center Drive Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	22	0	75	52	70	0	2	120	24	365
4:15 PM	0	0	0	33	0	80	49	72	0	4	113	21	372
4:30 PM	0	0	0	31	0	70	39	71	0	5	128	22	366
4:45 PM	0	0	0	27	0	61	46	48	0	5	136	11	334
5:00 PM	0	0	0	26	0	126	27	48	0	5	171	16	419
5:15 PM	0	0	0	13	0	51	27	61	0	1	148	9	310
5:30 PM	0	0	0	15	0	56	18	46	0	0	116	3	254
5:45 PM	0	0	0	8	0	51	26	31	0	2	96	3	217
TOTAL VOLUMES:	0	0	0	175	0	570	284	447	0	24	1028	109	2637

PM Peak Hr Begins at: 415 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	117	0	337	161	239	0	19	548	70	1491

PEAK HR FACTOR:	0.000	0.747	0.826	0.829	0.890

Bicycle Counts

	Corporate Center Drive Northbound			Corporate Center Drive Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	0	1	0	1

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

Pedestrian Counts

	Corporate Center Drive North Leg	Corporate Center Drive South Leg	Otay Mesa Road East Leg	Otay Mesa Road West Leg	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	1	0	0	0	1
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	1	0	0	0	1

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	0	0	0

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Innovative Drive
E/W: Otay Mesa Road

Date: 9/11/18
Day: TUESDAY
Project # 143-18999

TURNING MOVEMENT COUNT

Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Vehicle Counts

	Innovative Drive Northbound			Innovative Drive Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	23	0	62	1	0	49	9	144
7:15 AM	0	0	0	0	0	17	0	59	0	0	58	9	143
7:30 AM	0	0	2	0	0	17	0	55	0	0	48	4	126
7:45 AM	0	0	0	0	0	15	0	127	0	0	45	8	195
8:00 AM	0	0	0	0	0	18	0	102	1	0	72	7	200
8:15 AM	0	0	2	0	0	6	0	98	2	0	83	7	198
8:30 AM	0	0	3	0	0	8	0	103	0	0	72	12	198
8:45 AM	0	0	2	0	0	10	0	98	3	0	66	3	182
TOTAL VOLUMES:	0	0	9	0	0	114	0	704	7	0	493	59	1386

AM Peak Hr Begins at: 745 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	5	0	0	47	0	430	3	0	272	34	791

	Northbound	Southbound	Eastbound	Westbound	Total
PEAK HR FACTOR:	0.417	0.653	0.852	0.850	0.989

Bicycle Counts

	Innovative Drive Northbound			Innovative Drive Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	1
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	1	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	2	0	0	1	2	5

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	1	0	0	1	2	4

Pedestrian Counts

	Innovative Drive North Leg	Innovative Drive South Leg	Otay Mesa Road East Leg	Otay Mesa Road West Leg	TOTAL
7:00 AM	3	0	0	0	3
7:15 AM	8	0	0	0	8
7:30 AM	1	0	0	0	1
7:45 AM	2	0	0	0	2
8:00 AM	0	0	0	0	0
8:15 AM	4	0	0	0	4
8:30 AM	2	0	0	0	2
8:45 AM	3	0	0	0	3
TOTAL VOLUMES:	23	0	0	0	23

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	8	0	0	0	8

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Innovative Drive
E/W: Otay Mesa Road

Date: 9/11/18
Day: TUESDAY
Project # 143-18999

TURNING MOVEMENT COUNT

Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

Vehicle Counts

	Innovative Drive Northbound			Innovative Drive Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	2	0	0	28	0	99	1	0	142	12	284
4:15 PM	0	0	1	0	0	23	0	101	1	0	116	11	253
4:30 PM	0	0	1	0	0	23	0	95	4	0	134	7	264
4:45 PM	0	0	2	0	0	19	0	89	1	0	112	11	234
5:00 PM	0	0	1	0	0	39	0	91	0	0	151	5	287
5:15 PM	0	0	1	0	0	32	0	86	0	0	157	6	282
5:30 PM	0	0	0	0	0	19	0	63	1	0	115	1	199
5:45 PM	0	0	1	0	0	8	0	58	0	0	116	4	187
TOTAL VOLUMES:	0	0	9	0	0	191	0	682	8	0	1043	57	1990

PM Peak Hr Begins at: 430 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	5	0	0	113	0	361	5	0	554	29	1067

PEAK HR FACTOR:	0.625	0.724	0.924	0.894	0.929

Bicycle Counts

	Innovative Drive Northbound			Innovative Drive Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
TOTAL VOLUMES:	0	0	0	1	0	0	0	3	0	0	5	0	9

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	1	0	0	0	1	0	0	1	0	3

Pedestrian Counts

	Innovative Drive North Leg	Innovative Drive South Leg	Otay Mesa Road East Leg	Otay Mesa Road West Leg	TOTAL
4:00 PM	3	0	0	0	3
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	1	0	0	0	1
5:15 PM	2	0	0	0	2
5:30 PM	1	0	0	0	1
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	7	0	0	0	7

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	3	0	0	0	3

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Heritage Road
E/W: Otay Mesa Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **7:00 AM to 9:00 AM**
Peak Hour: **8:00AM to 9:00 AM**

Vehicle Counts

	Heritage Road Northbound			Heritage Road Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	12	5	6	24	4	13	16	24	19	8	24	11	166
7:15 AM	6	4	5	12	8	13	16	21	22	9	26	16	158
7:30 AM	12	6	4	22	2	13	18	19	25	9	26	37	193
7:45 AM	16	4	4	27	6	12	29	31	38	9	38	34	248
8:00 AM	15	5	4	21	5	14	24	26	43	11	31	32	231
8:15 AM	12	11	15	22	7	10	35	34	19	9	26	21	221
8:30 AM	9	7	8	22	5	14	26	32	23	10	44	31	231
8:45 AM	18	10	11	21	6	25	41	26	20	7	36	32	253
TOTAL VOLUMES:	100	52	57	171	43	114	205	213	209	72	251	214	1701

AM Peak Hr Begins at: 800 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	54	33	38	86	23	63	126	118	105	37	137	116	936

	Northbound	Southbound	Eastbound	Westbound	TOTAL
PEAK HR FACTOR:	0.801	0.827	0.938	0.853	0.925

Bicycle Counts

	Heritage Road Northbound			Heritage Road Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	1	0	0	0	0	0	1	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	1	0	1	0	0	0	0	0	0	2
7:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	3
TOTAL VOLUMES:	0	2	0	1	0	2	0	0	0	0	3	1	9

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	0	0	0	3	0	3

Pedestrian Counts

	Heritage Road North Leg	Heritage Road South Leg	Otay Mesa Road East Leg	Otay Mesa Road West Leg	TOTAL
7:00 AM	0	0	6	0	6
7:15 AM	0	0	4	0	4
7:30 AM	0	0	2	0	2
7:45 AM	0	0	5	0	5
8:00 AM	0	0	1	0	1
8:15 AM	0	0	0	0	0
8:30 AM	0	0	4	0	4
8:45 AM	0	0	2	0	2
TOTAL VOLUMES:	0	0	24	0	24

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	0	7	0	7

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Heritage Road
E/W: Otay Mesa Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:15 PM to 5:15 PM**

Vehicle Counts

	Heritage Road Northbound			Heritage Road Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	26	8	13	51	11	56	42	40	18	10	54	39	368
4:15 PM	32	6	13	40	12	44	27	51	21	8	60	49	363
4:30 PM	37	15	10	47	20	52	38	56	11	2	61	31	380
4:45 PM	20	8	9	37	10	61	26	31	13	4	53	37	309
5:00 PM	34	4	11	73	14	66	25	45	22	10	72	38	414
5:15 PM	32	13	16	49	16	70	18	28	23	5	43	28	341
5:30 PM	32	9	6	31	13	43	16	34	10	12	42	27	275
5:45 PM	24	5	10	27	7	39	12	22	13	5	30	17	211
TOTAL VOLUMES:	237	68	88	355	103	431	204	307	131	56	415	266	2661

PM Peak Hr Begins at: 415 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	123	33	43	197	56	223	116	183	67	24	246	155	1466

PEAK HR FACTOR:	0.802	0.778	0.871	0.885	0.885

Bicycle Counts

	Heritage Road Northbound			Heritage Road Southbound			Otay Mesa Road Eastbound			Otay Mesa Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	1	0	1	0	0	0	0	0	0	1	1	4

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	1	0	0	0	0	0	0	0	1	2

Pedestrian Counts

	Heritage Road North Leg	Heritage Road South Leg	Otay Mesa Road East Leg	Otay Mesa Road West Leg	TOTAL
4:00 PM	0	0	3	0	3
4:15 PM	0	0	2	0	2
4:30 PM	0	1	1	1	3
4:45 PM	0	0	3	0	3
5:00 PM	0	1	5	1	7
5:15 PM	0	0	5	0	5
5:30 PM	0	0	2	0	2
5:45 PM	0	0	1	0	1
TOTAL VOLUMES:	0	2	22	2	26

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	0	2	11	2	15

Caltrans 2016 Data

Dist	Route	County		Postmile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
11	905	SD		5.164	JCT. RTE. 805	6200	66000	64000	6800	83000	79000
11	905	SD	R	6.723	CALIENTE ROAD	6800	83000	79000	6200	71000	**70000**
11	905	SD	R	8.782	BRITANNIA BLVD	6200	71000	70000	4800	64000	58000

OCEANVIEW / STARFISH / WESTPORT VIEW 1

INTERSECTION: OCEAN VIEW HILLS Py @ STARFISH Wy / WESTPORT VIEW Dr

Row		1	2	3	4	5	6	7	8
0	Ped Walk		7		7		7		7
1	Ped FDW		10		20		10		20
2	Min Green	4	10		7	4	10		7
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	6.4		2.0	2.0	6.4		2.0
6	Max Gap	2.0	6.4		2.0	2.0	6.4		2.0
7	Min Gap	2.0	0.2		2.0	2.0	0.2		2.0
8	Max Limit	30	60		40	30	60		40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		
D	Every		0.5				0.5		
E	Yellow	3.4	4.5		3.9	3.4	4.8		3.9
F	Red Clear	1.0	1.0		1.0	1.0	1.0		1.0
	Grade						-2.0		

Phase Timing - Bank 1
F + Phase + Row
<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Prompt Timing
F + E + Row

	F	Row
Permit	12_456_8	0
Red Lock		1
Yellow Lock		2
Min Recall		3
Ped Recall		4
Peds (View)	_2_4_6_8	5
Rest In Walk		6
Red Rest		7
DN Entry	4 8	8
Max Recall		9
Soft Recall	2 6	A
Max 2		B
Cond Serv		C
Ped Lock	12345678	D
Yellow Start	2 6	E
1st Phases	[illegible]	F

Phase Functions <F Page>
F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	2	C + 0 + 0
Zone Number	3	C + 0 + 1
Area Number	7	C + 0 + 2
Area Address	2.5	C + 0 + 3
QuickNet Channel	Com 3 4	(QuickNet)

Communication Addresses

Overlap Timing

	Row	Green Clear	Yellow Change	Red Clear	Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<O Page>

C + F + O	F	Row
Free Lag	_2_4_6_8	0

Lag Phases <C Page>

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + C + 8

Disable Ports	224

Disable Communication Ports
D + D + 9

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Timing Sheet By:
Approved By:
Drawing Number:
Timing Implemented On:

4N

Wy / Del Sol Bl @ Ocean View Hills Py

223 Pr... am

Group Assignment:
Field Master Assignment: None

N/S Street Name: Ocean View Hills Py
E/W Street Name: Del Sol Bl

Last Change:
Timing Sheet By: rej
Approved By:

Drawing Number: 30853-2-D
System Ref. Number:
Timing implemented on: Nov 28, 2001

3

9/08 MCL

Row	Column # → / Phase # →	1	2 Ocean View Hills Py	3	4 Breakers Wy	5	6 Ocean view Hills Py	7	8 Del Sol Bl
0	Ped Walk		7		7		7		7
1	Ped FDW		①19 ~~18~~		27		10		29 ~~28~~
2	Min Green	4	10	4	7	4	10	4	7
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	5.4	2.0	2.0	2.0	5.4	2.0	5.6
6	Max Gap	2.0	5.4	2.0	2.0	2.0	5.4	2.0	5.6
7	Min Gap	2.0	0.2	2.0	2.0	2.0	0.2	2.0	0.2
8	Max Limit	30	60	30	40	30	60	30	40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs			2				6	
C	Reduce By		0.1				0.1		0.1
D	Every		0.6				0.6		0.6
E	Yellow	3.4 ~~3.0~~	①4.4 ~~5.0~~	3.4 ~~3.0~~	3.9 ~~3.0~~	3.4 ~~3.0~~	4.6 ~~5.0~~	3.4 ~~3.0~~	3.9 ~~4.3~~
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 1
F + Phase + Row
<F Page>

Row		E
0	RR-1 Delay	
1	RR-1 Clear	
2	EV-A Delay	0
3	EV-A Clear	0
4	EV-B Delay	0
5	EV-B Clear	0
6	EV-C Delay	0
7	EV-C Clear	0
8	EV-D Delay	0
9	EV-D Clear	0
A	RR-2 Delay	
B	RR-2 Clear	
C	View EV Delay	---
D	View EV Clear	---
E	View RR Delay	---
F	View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12345678
1	Red Lock	
2	Yellow Lock	
3	Min Recall	
4	Ped Recall	
5	Peds (View)	
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	_2__6__
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2__6__
F	1st Phases	___4__8

Phase Functions <F Page>
F + F + Row

Max Initial		F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + 0

Start / Revert Times

Drop Number	4	C + 0 + 0
Zone Number	4	C + 0 + 1
Area Number	7	C + 0 + 2
Area Address	74	C + 0 + 3
QuicNet Channel	Com34	(QuicNet)

Communication Addresses

C + F + 0	E	Row
Free Lag	_2_4_6_8	1

Lag Phases <C Page>

Row		9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
A	Overlap A				
B	Overlap B				
C	Overlap C				
D	Overlap D				

Overlap Timing <F Page> F + COLOR + <D Page> D + 0 + OVERLAP

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset 0
= Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Disable Ports	234

Disable Communications Ports
D + D + 9

PHASE 3 TO 4 AND 7 TO 8 ARE HARDWIRED WITH A DIRECTIONAL DIODE

B[illegible]kers Wy / Del Sol Bl @ Ocean View Hills Py

223 Program

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function <D Page>

7 + ROW D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		[illegible]
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration <E Page>

E + F + ROW

Day of Week
1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	3 7
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration

For access, set F + 9 + E = 1 E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Time and Date
8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Program Information
C + C + 0 = program
C + C + F = version

Remote Download
C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

(This parameter is NOT downloaded)

#

Row	Delay	Carry-over	Detector Name	332 Input File	Detector Number
	[illegible]	3			
0				1I1	14
1		1.8		2I2U	1
2		1.8		2I2L	5
3				2I3U	21
4				2I3L	25
5				2I4	9
6				3I5	16
7				4I6U	3
8				4I6L	7
9				4I7U	23
A				4I7L	27
B				4I8	11
C				1I9U	18
D				3I9L	20
E		---	---	---	---
F	---	---	---	---	---

Row	Delay	Carry-over	Detector Name	332 Input File	Detector Number
	2	4			
0				5J1	13
1		1.8		6J2U	2
2		1.8		6J2L	6
3				6J3U	22
4				6J3L	26
5				6J4	10
6				7J5	15
7		1.8		8J6U	4
8				8J6L	8
9				8J7U	24
A	10.0			8J7L	28
B				8J8	12
C				5J9U	17
D				7J9L	19
E	---	---	---	---	---
F	---	---	---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 – – – –	1234
C	13 14 15 16 17 18 19 20	12345678
D	– – – – 21 22 23 24	5678
E	– – – – – – – –	1234
F	– 25 26 27 28 – – –	2345

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	0
2	System Det. # 2	0
3	System Det. # 3	0
4	System Det. # 4	0
5	System Det. # 5	0
6	System Det. # 6	0
7	System Det. # 7	0
8	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)
(These parameters are NOT downloaded.)

Page 1 (of 9)

INTERSECTION: OCEAN VIEW HILLS & SEAFIRE POINT

Group Assignment: NONE
Field Master Assignment: NONE
System Reference Number: 1076

N/S Street Name: SEAFIRE POINT
E/W Street Name: OCEAN VIEW HILLS PY

Last Database Change: 10/15/2008 14:02

DRH
10/16/08 12:30

Notes: *Redefine Detector Attributes for I4L (Phase 2) and J4L (Phase 6)*

Change Record					
Change	By	Date	Change	By	Date
Original	DRH	10/16			

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Drop Number	8	<C/0+0+0>
Zone Number	8	<C/0+0+1>
Area Number	7	<C/0+0+2>
Area Address	53	<C/0+0+3>
QuicNet Channel	COM34:	(QuicNet)

Communication Addresses

Manual Plan	14	<C/0+A+1>
Manual Offset		<C/0+B+1>

Manual Selection

Flash Start	0	<F/1+0+E>
Red Revert	0.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>

Start / Revert Times

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase
(Outputs specified in Assignable Outputs at E/127+A+E & F)

OCEAN VIEW HILLS | SEAFIRE | OCEAN VIEW HILLS | FUTURE ST "A"

AZ

Row	Column Numbers ----> / Phase Names ---->	1	2	3	4	5	6	7	8
0	Ped Walk	0	7	0	7	0	7	0	7
1	Ped FDW	0	22	0	25	0	6	0	24
2	Min Green	4	10	0	4	4	10	0	4
3	Type 3 Disconnect	0	0	0	0	0	0	0	0
4	Added per Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Veh Extension	2.0	5.4	0.0	2.0	2.0	5.4	0.0	2.0
6	Max Gap	2.0	5.4	0.0	2.0	2.0	5.4	0.0	2.0
7	Min Gap	2.0	0.2	0.0	2.0	2.0	0.2	0.0	2.0
8	Max Limit	30	60	0	40	30	60	0	40
9	Max Limit 2	0	0	0	0	0	0	0	0
A	Adv. / Delay Walk	0	0	0	0	0	0	0	0
B	PE Min Ped FDW	0	0	0	0	0	0	0	0
C	Cond Serv Check	0	0	0	0	0	0	0	0
D	Reduce Every	0.0	0.6	0.0	0.0	0.0	0.6	0.0	0.0
E	Yellow Change	3.4	5.0	0.0	3.9	3.4	5.0	0.0	3.9
F	Red Clear	1.0	1.0	0.0	1.0	1.0	1.0	0.0	1.0

Phase Timing - Bank 1 <C+0+F=1>

	9	A	B	C	D
	---	---	---	---	---
Phase 1	0	0	0	0	0.0
Phase 2	0	0	0	0	0.0
Phase 3	0	0	0	0	0.0
Phase 4	0	0	0	0	0.0
Phase 5	0	0	0	0	0.0
Phase 6	0	0	0	0	0.0
Phase 7	0	0	0	0	0.0
Phase 8	0	0	0	0	0.0

Max Initial
Alternate Walk
Alternate FDW
Alternate Initial
Alternate Extension

Alternate Timing <C+0+F=1>

	E
RR-1 Delay	0
RR-1 Clear	0
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	0
RR-2 Clear	0
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing

	F	Row
Permit	12_456_8	0
Red Lock	______	1
Yellow Lock	______	2
Min Recall	______	3
Ped Recall	______	4
View Set Peds	-----	5
Rest In Walk	______	6
Red Rest	______	7
Dual Entry	___4___8	8
Max Recall	______	9
Soft Recall	_2___6__	A
Max 2	______	B
Cond. Service	______	C
Man Cntrl Calls	______	D
Yellow Start	_2___6__	E
First Phases	___4___8	F

Phase Functions <C+0+F=1>

Printed on 10/15/2008 2:07 PM | Timing Sheet Version: 233 RV2 | Revision: 30826

LOCATION: RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY

CALTR[illegible] C8 Version 3 DATE: 3/3/[illegible] PA[illegible] #3 6

F PAG[illegible]

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9	PRE-EMPTION E		FLAGS	F 1	2	3	4	5	6	7	8	
0	WALK	1	1	1	7	1	7	1	7	CLK RST	EV SEL	0	PERMIT	1	2	3	4	5	6	7	8	0
1	DONT WALK	1	1	1	39	1	45	1	42		RR1 CLR	5	RED LOCK									1
2	MIN GREEN	11	11	11	11	11	11	11	11		EVA DLY	0	YEL LOCK									2
3	TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5	V RECALL		2				6			3
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0	P RECALL									4
5	PASSAGE	2.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0		EVB CLR	5	PED PHASES				4		6		8	5
6	MAX GAP	2.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0		EVC DLY	0	RT OLA									6
7	MIN GAP	2.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0		EVC CLR	5	RT OLB									7
8	MAX EXT	20	35	20	25	15	35	20	25		EVD DLY	0	DBL ENTRY									8
9	MAX 2			35						YR	EVD CLR	5	MAX 2 PHASES			3						9
A	MAX 3									MO	MAX EV	255	LAG PHASES	READ ONLY								A
B										DAY	RR2 CLR	5	RED REST									B
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW			REST-IN-WALK									C
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR			MAX 3 PHASES									D
E	YELLOW	3.7	4.8	3.7	4.1	3.7	4.8	3.7	5.2	MIN			YEL START UP				4				8	E
F	RED	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	SEC			FIRST PHASE		2				6			F
3.5'	PED XING FT				137'		156'		146'					1	2	3	4	5	6	7	8	
	BIKE XING FT	132'	158'	113'	146'	131'	161'	136'	147'													

NOTES:

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY

CA[illegible]NS C8 Version 3 DATE: 12[illegible]2012

C PAGE

#3

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER:
EB @ Caliente Ave

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		1
2		2
3	4	
4	8	
5	16	
6	32	
7		
8		

COO = 3

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY

CALTRANS C8 Version 3 DATE 12/13/12 PAGE 3

#3

D PAGE

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

D-E-E = C8 VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

LOCATION: RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY

CALTRANS C8 Version 3 DATE: 12/13/12

#3

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
				ON/	S	M	T	W	T	F	S
	HR	MIN	ACT	OFF	1	2	3	4	5	6	7
0	15	00	2	ON		2	3	4	5	6	
1	17	30	2	OFF		2	3	4	5	6	
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

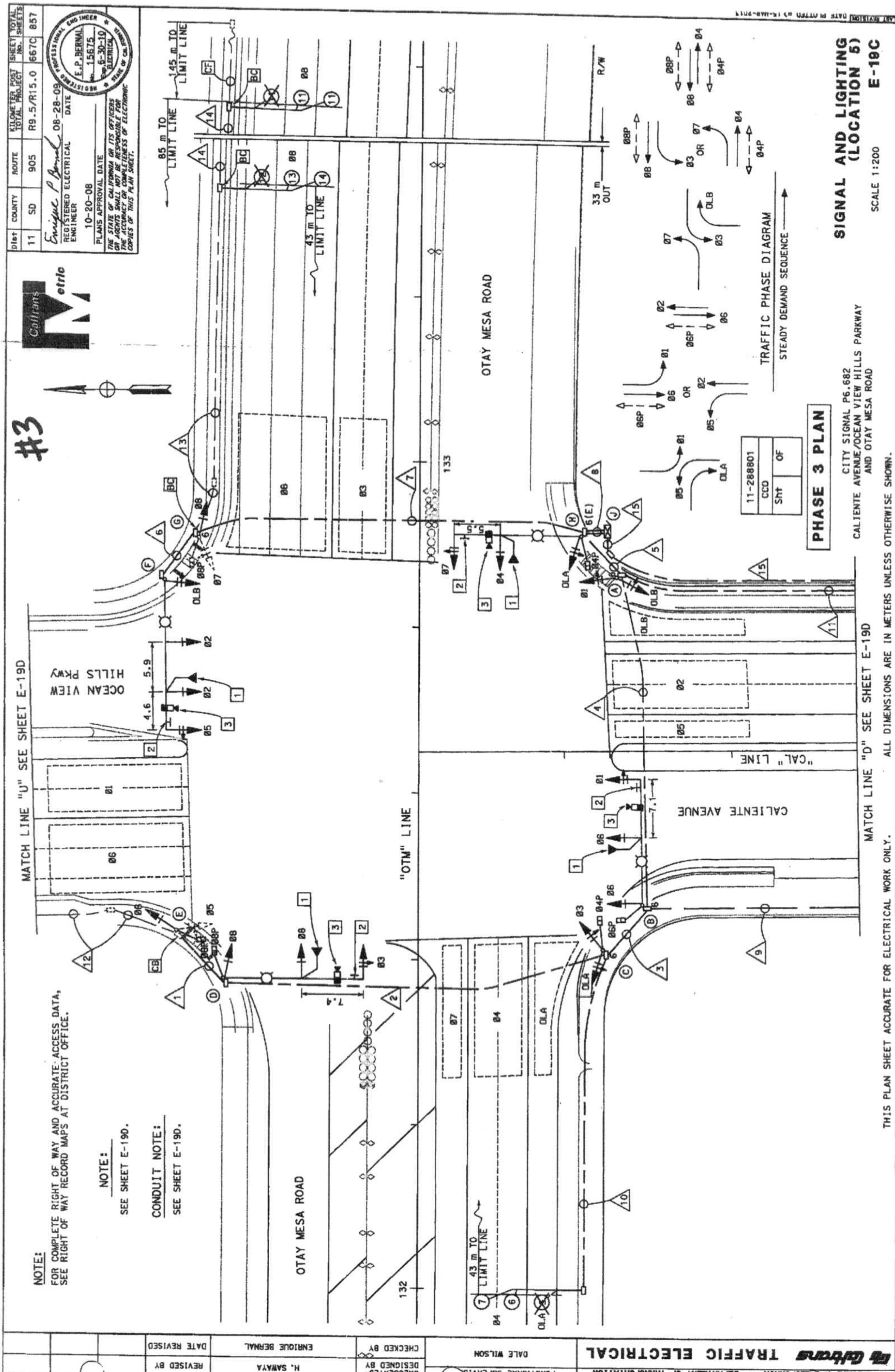
CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE C09 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											


SIGNAL AND LIGHTING (LOCATION 5)
E-19C
SCALE 1:200
PHASE 3 PLAN
CITY SIGNAL P6.682
CALIENTE AVENUE/OCEAN VIEW HILLS PARKWAY AND OTAY MESA ROAD
TRAFFIC PHASE DIAGRAM
STEADY DEMAND SEQUENCE
11-288801
OTAY MESA ROAD
CALIENTE AVENUE
OCEAN VIEW HILLS PKWY
"OTM" LINE
"CAL" LINE
MATCH LINE "U" SEE SHEET E-19D
MATCH LINE "D" SEE SHEET E-19D
ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.
THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY.
NOTE:
FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
NOTE:
SEE SHEET E-19D.
CONDUIT NOTE:
SEE SHEET E-19D.
145 m TO LIMIT LINE
85 m TO LIMIT LINE
43 m TO LIMIT LINE
33 m OUT
R/W
Dist 11 COUNTY SD ROUTE 905 KILOMETER POST TOTAL PROJECT R9.5/R15.0 SHEET No. 667C TOTAL SHEETS 857
REGISTERED ELECTRICAL ENGINEER 08-28-09
10-20-08 PLANS APPROVAL DATE
E.P. BERNAL No. 15675 Exp. 6-30-10 ELECTRICAL
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
TRAFFIC ELECTRICAL
DALE WILSON
H. SARVAYA
ENRIQUE BERNAL
#3

LOCATION: 905 WB @ Caliente Ave
CALTRANS C8 Version 3
F PAGE

3/4/13

#4 7

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9	PRE-EMPTION E	
0	WALK	1	7	1	1	1	7	1	1	CLK RST	EV SEL	0
1	DONT WALK	1	14	1	1	1	18	1	1		RR1 CLR	15
2	MIN GREEN	1	7	1	1	5	7	1	5		EVA DLY	0
3	TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0
5	PASSAGE	0.9	3.0	0.9	0.9	2.0	3.0	0.9	3.0		EVB CLR	5
6	MAX GAP	0.9	3.0	0.9	0.9	2.0	3.0	0.9	3.0		EVC DLY	0
7	MIN GAP	0.9	3.0	0.9	0.9	2.0	3.0	0.9	3.0		EVC CLR	5
8	MAX EXT	9	30	9	9	25	30	9	30		EVD DLY	0
9	MAX 2									YR	EVD CLR	5
A	MAX 3									MO	MAX EV	255
B										DAY	RR2 CLR	15
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW		
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR		
E	YELLOW	3.0	4.1	3.0	3.0	3.7	4.1	3.0	4.1	MIN		
F	RED	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	SEC		
3.5'	PED XING FT		50'				50'					
	BIKE XING FT		57'				81'					

F FLAGS	1	2	3	4	5	6	7	8	
PERMIT		2			5	6		8	0
RED LOCK									1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES		2				6			5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES									9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES									D
YEL START UP		2				6			E
FIRST PHASE								8	F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	30
FOF	5

FC0	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

C05 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: 905 WB @ Caliente Ave
CALTRANS C8 Version 3
C PAGE

8/15/12

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

System Master:
EB @ Caliente Ave

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		
2		2
3		
4		
5		
6		
7		
8		

COO = 2

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: 905 WB @ Caliente Ave
CALTRANS C8 Version 3
D PAGE

7/12/12

#9

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

D-E-E = C8 VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

L[illegible]TION: 905 WB @ Caliente Ave
CA[illegible]RANS C8 Version 3 7/12/12

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
				ON/	S	M	T	W	T	F	S
	HR	MIN	ACT	OFF	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE C09 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905	R9.5/R15.0	667	857

Enrique P. Bernal 08-28-09
REGISTERED ELECTRICAL ENGINEER DATE
10-20-08
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER E.P. BERNAL No. 15675 Exp. 6-30-10 ELECTRICAL STATE OF CALIFORNIA

Caltrans Metric

#4

NOTES:

1 - TERMINATE EVC IN RED SECTION OF HOUSING. LEAVE 1 m OF SLACK.

2 - DETAIL "U" ES-7N. SEE SIGN PLANS.

3 - CONDUIT AND CABLE CONTINUOUS TO SIGNAL AND LIGHTING (LOCATION 1).

4 - FURNISH AND INSTALL VDU, COMMUNICATION CARD, AND VIDEO DISPLAY IN TYPE 332 CABINET.

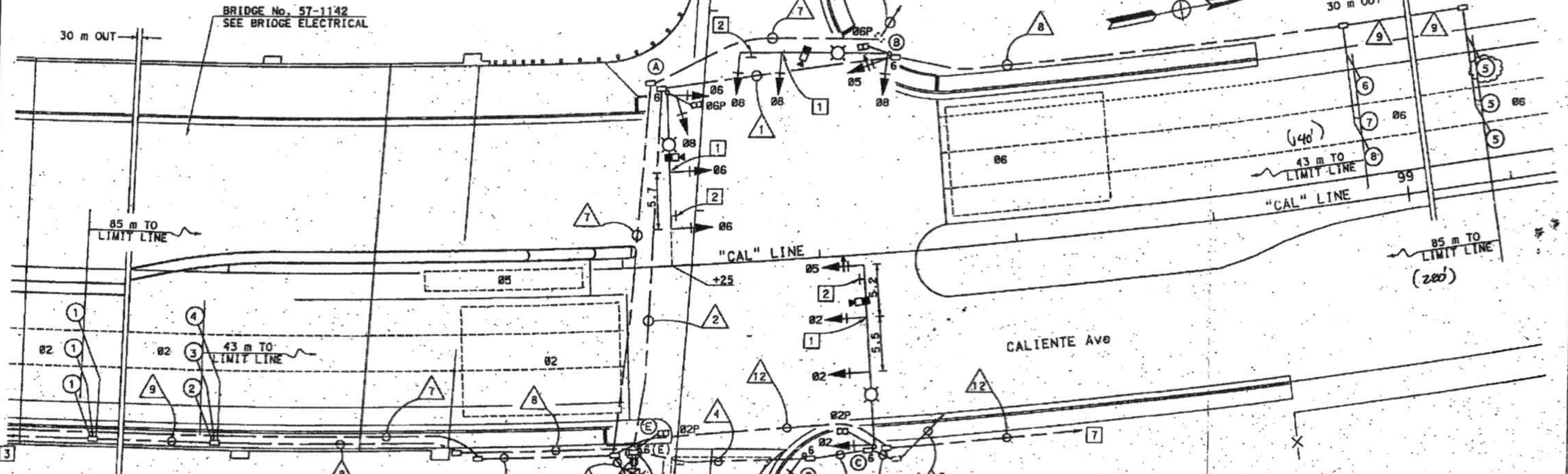
5 - FURNISH AND INSTALL COMMUNICATION EQUIPMENT PER COMPONENT DIAGRAM. SEE ELECTRICAL DETAILS.

6 - FURNISH AND INSTALL BATTERIES AND EXTERNAL BBS CABINET.

7 - CONDUIT AND CABLE CONTINUOUS TO SIGNAL AND LIGHTING (CITY LOCATION 1)

FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.

TRAFFIC PHASE DIAGRAM
STEADY DEMAND SEQUENCE



CONDUIT AND CONDUCTOR SCHEDULE

AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	103 (1)	103 (2)	103 (3)	103 (4)	2-103 (5)
No. 14 CONDUCTORS							
3CSC / 12CSC		POLE - A		1/1			1/1
		B	1/1	1/1			1/1
		C			1	1	1
		D				1/1	1/1
		E					1/1
TOTAL 3CSC / 12CSC			1/1	2/2	1	1/2	3/5
8		LIGHTING	2	2	2	2	
(8)		CONTROLLER			2	2	2
TYPE B DLC	Ø2						4
	Ø5						
	Ø6		4	4			4
	Ø8						2
VIDEO CABLE HARNESS	Ø6	POLE - A		1			1
	Ø8	B	1	1			1
	Ø2/Ø5	C			1	1	1
EVC			1	2	1	1	3
TOTAL CONDUCTORS / CABLES			10	14	7	9	27

CONDUIT NOTES:

6 - 53C, 2 SIC, 2 OCC
7 - 53C, 1 OCC, 1 SIC
8 - 53C, 4 DLC
9 - 53C, 1 DLC
10 - 53C, 2 DLC
11 - 53C, 2#8(L), 2#6(SIG)
12 - 53C, 1 SIC

EQUIPMENT AND POLE SCHEDULE

LOC	STANDARD TYPE	SMA (m)	LMA (m)	PLACEMENT DIMENSIONS A (m)	B (m)	VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PPB	REMARKS
A	26-4-161	T3.7	4.6	PER PLAN	2.0	SV-2-TD	2 MAS	SP-1-T	Ø6P	200 W HPS
B	29-5-161	15.2	4.6	8.3	2.4	SV-2-TD	2 MAS	SP-1-T	Ø6P	200 W HPS
C	29-5-161	16.8	4.6	2.3	2.2	SV-1-T	MAT 2 MAS	SP-1-T	—	200 W HPS
D	1-A (3 m)	—	—	5.7	1.0	TV-1-T	—	—	Ø2P	
E	1-A (2.4 m)	—	—	1.8	2.2	—	—	TP-1-T	Ø2P	
F	STATE FURNISHED MODEL 170 CONTROLLER ASSEMBLY. FOUNDATION PER E-236. 4 5 6									

11-288801	
CCO	
Sht	OF

PHASE 3 PLAN

PR6.715
ROUTE 905 WB RAMP
AT CALIENTE AVENUE

SIGNAL AND LIGHTING (LOCATION 2)

SCALE 1:200

E-19

THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
TRAFFIC ELECTRICAL

FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
DALE WILSON	K. SARAYA		ENRIQUE BERNAL	

LOC[illegible]ON: 905 EB @ Caliente Ave
CAL[illegible]NS C8 Version 3
F PAGE

3/4/15

PAGE 1 #5 8

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9	PRE-EMPTION E		FLAGS	F 1	2	3	4	5	6	7	8	
0	WALK	1	7	1	1	1	7	1	1	CLK RST	EV SEL	0	PERMIT	1	2		4		6			0
1	DONT WALK	1	14	1	1	1	14	1	1		RR1 CLR	15	RED LOCK									1
2	MIN GREEN	5	7	1	5	1	7	1	1		EVA DLY	0	YEL LOCK									2
3	TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5	V RECALL		2				6			3
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0	P RECALL									4
5	PASSAGE	2.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9		EVB CLR	5	PED PHASES		2				6			5
6	MAX GAP	2.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9		EVC DLY	0	RT OLA									6
7	MIN GAP	2.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9		EVC CLR	5	RT OLB									7
8	MAX EXT	15	30	9	30	9	30	9	9		EVD DLY	0	DBL ENTRY									8
9	MAX 2									YR	EVD CLR	5	MAX 2 PHASES									9
A	MAX 3									MO	MAX EV	255	LAG PHASES	READ ONLY								A
B										DAY	RR2 CLR	15	RED REST									B
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW			REST-IN-WALK									C
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR			MAX 3 PHASES									D
E	YELLOW	3.7	4.1	3.0	4.1	3.0	4.1	3.0	3.0	MIN			YEL START UP		2				6			E
F	RED	1.0	1.0	0.0	1.0	0.0	1.0	0.0	0.0	SEC			FIRST PHASE				4					F
3.5'	PED XING FT		48'				48'							1	2	3	4	5	6	7	8	
	BIKE XING FT		67'				60'															

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	30
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FDO TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

System Master:
EB @ Caliente Ave

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		1
2		
3		
4		
5		
6		
7		
8		

COO = 1

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: 905 EB @ Caliente Ave
CALTRANS C8 Version 3
D PAGE

7/18/12

#5

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

D-E-E = C8 VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

LOCATION: 905 EB @ Caliente Ave
CALTRANS C8 Version 3 7/18/12
PAGE 4

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE C09 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

CONDUIT AND CONDUCTOR SCHEDULE

AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	103 △1	103 △2	103 △3	103 △4	103 △5	103 △6	(53) △7	2-103 △8
No. 14 CONDUCTORS										
3CSC / 12CSC		POLE - A			1 / 1	1 / 1				1 / 1
		B		(1) / 1	1 / 1	1 / 1				1 / 1
		C	(1)	(1) / 1	1 / 1	1 / 1				1 / 1
		D					1 / 1	1 / 1		1 / 1
		E						1		1
		F							1	1
TOTAL 3CSC / 12CSC			1 / 1	2 / 2	3 / 5	3 / 3	1 / 1	2 / 1	/ 1	5 / 5
8		LIGHTING			2	2	2	2	2	
		CONTROLLER			2	2				2
		(F)			2					
TYPE B DLC	Ø1									
	Ø2					4				4
	Ø4			2	2	2				2
	Ø6		4	4	4	4				4
VIDEO CABLE HARNESS	Ø2	POLE - D					1	1		1
	Ø4	F							1	1
	Ø1 / Ø6	A			1	1				1
EVC					1	1	1	1	1	3
TOTAL CONDUCTORS / CABLES			6	10	20	22	6	7	5	28

CONDUIT NOTES:

F/9 - 27C, 1 FO12
27C, 1 OCC

△10 - 53C, 1 OCC 1 SIC

△11 - (53C) 1 DLC

△12 - 53C, 4 DLC

△13 - (53C) 2 DLC

△14 - 53C, 2#8(L) 2#8(SIG) 2#8(F) 4#14(PEU)

△15 - 53C, WITH 1 OCC 1 SIC 1 SIC(TELEPHONE)

△16 - 53C, WITH 1 SIC(TELEPHONE)

NOTES:

1 - TERMINATE EVC IN RED SECTION OF HOUSING. LEAVE 1 m OF SLACK.

2 - DETAIL "U" ES-7N. SEE SIGN PLANS.

3 - PLACE LUMINAIRE COUNTER-CLOCKWISE 60° TO SIGNAL MAST ARM.

4 - FURNISH AND INSTALL VDU, COMMUNICATION CARD, AND VIDEO DISPLAY IN TYPE 332 CABINET.

5 - FURNISH AND INSTALL COMMUNICATION EQUIPMENT PER COMPONENT DIAGRAM. SEE ELECTRICAL DETAILS.

6 - FURNISH AND INSTALL BATTERIES AND EXTERNAL BBS CABINET.

7 - CONDUIT AND CABLE CONTINUOUS TO SIGNAL AND LIGHTING (LOCATION 2).

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905	R9.5/R15.0	666	857

Enrique P. Bernal 08-28-09
REGISTERED ELECTRICAL ENGINEER DATE

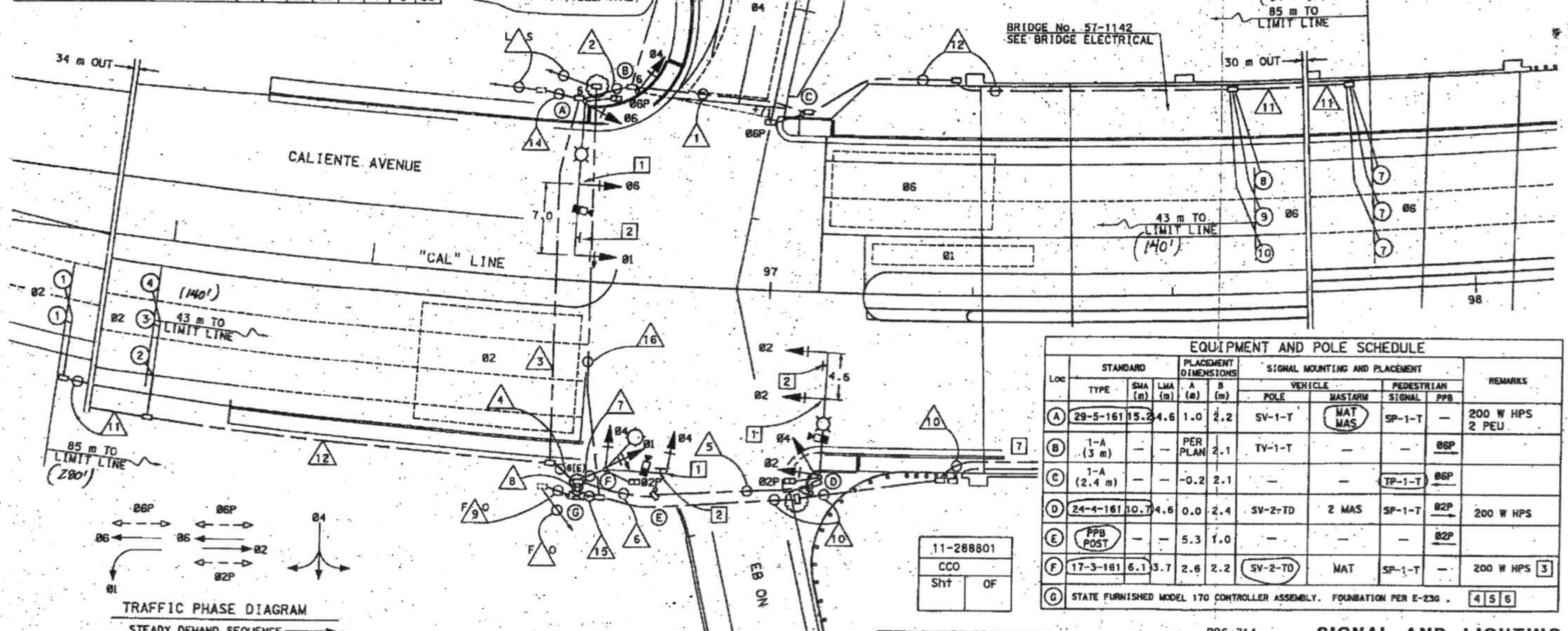
10-20-08
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER E.P. BERNAL No. 15675 Exp. 6-30-10 ELECTRICAL STATE OF CALIFORNIA

Caltrans Metric

#5



11-288801	
CCO	
Sht	OF

EQUIPMENT AND POLE SCHEDULE

Loc	STANDARD TYPE	SMA (m)	LMA (m)	PLACEMENT DIMENSIONS A (m)	B (m)	VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PPB	REMARKS
A	29-5-161	15.2	4.6	1.0	2.2	SV-1-T	MAT MAS	SP-1-T	—	200 W HPS 2 PEU
B	1-A (3 m)	—	—	PER PLAN	2.1	TV-1-T	—	—	Ø6P	
C	1-A (2.4 m)	—	—	-0.2	2.1	—	—	TP-1-T	Ø6P	
D	24-4-161	10.7	4.6	0.0	2.4	SV-2-TD	2 MAS	SP-1-T	Ø2P	200 W HPS
E	PPB POST	—	—	5.3	1.0	—	—	—	Ø2P	
F	17-3-161	6.1	3.7	2.6	2.2	SV-2-TD	MAT	SP-1-T	—	200 W HPS 3
G	STATE FURNISHED MODEL 170 CONTROLLER ASSEMBLY. FOUNDATION PER E-23G.									4 5 6

PHASE 3 PLAN

PR6:714
ROUTE 905 EB RAMP
AT CALIENTE AVENUE

SIGNAL AND LIGHTING (LOCATION 1)

SCALE 1:200

E-18

THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

Caltrans STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
TRAFFIC ELECTRICAL

FUNCTIONAL SUPERVISOR DALE WILSON
CALCULATED-DESIGNED BY H. SAWAYA
CHECKED BY ENRIQUE BERNAL
REVISED BY
DATE REVISED

12

Corpo[illegible]e Center Dr and Otay Mesa Rd

223 Pr[illegible]am

Group Assignment:
Field Master Assignment: None

N/S Street Name: Corporate Center Dr
E/W Street Name: Otay Mesa Rd

Last Change:
Timing Sheet By: REJ
Approved By:

Drawing Number: 29824-35-D
System Ref. Number:
Timing implemented on: Dec 05, 2000

Row	Column # ---> / Phase # --->	1 (Otay Mesa Rd)	2 (Otay Mesa Rd)	3 (Corporate Cnt)	4 (Corporate Cnt)	5 (Otay Mesa Rd)	6 (Otay Mesa Rd)	7	8
				OLA	OLA OLB	OLA			
0	Ped Walk			7			7		
1	Ped FDW			31			25		
2	Min Green	4	10	38	7	4	10		
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	5.0		2.0	2.0	5.5		
6	Max Gap	2.0	5.0		2.0	2.0	5.5		
7	Min Gap	2.0	0.2		2.0	2.0	0.2		
8	Max Limit	30	60		30	30	60		
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		
D	Every		0.6				0.6		
E	Yellow	3.0	5.3	3.0	3.0	3.0	5.0		
F	Red Clear	1.0	2.0		1.0	1.0	2.0		

Phase Timing - Bank 1
F + Phase + Row
<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	
EV-D Clear	
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

	F	Row
Permit	123456	0
Red Lock		1
Yellow Lock		2
Min Recall		3
Ped Recall		4
Peds (View)		5
Rest In Walk		6
Red Rest		7
Dbl Entry		8
Max Recall		9
Soft Recall	_2___6__	A
Max 2		B
Cond Serv		C
Ped Lock	12345678	D
Yellow Start	_2___6__	E
1st Phases	____4____	F

Phase Functions <F Page>
F + F + Row

Max Initial		F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number		C + 0 + 0
Zone Number		C + 0 + 1
Area Number		C + 0 + 2
Area Address		C + 0 + 3
QuicNet Channel		(QuicNet)

Communication Addresses

C + F + O

	F	Row
Free Lag	_2_4_6_8	0

Lag Phases <C Page>

Row		9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
A	Overlap A				
B	Overlap B				
C	Overlap C				
D	Overlap D				

Overlap Timing <F Page> <D Page>
F + COLOR + D + 0 + OVERLAP

Downtime Flash	60	(minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset 0
= Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Disable Ports	234

Disable Communications Ports
D + D + 9

Appendix I

Existing Level of Service Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	4	4	68	7	53	2	542	28	42	543	22
Future Volume (veh/h)	60	4	4	68	7	53	2	542	28	42	543	22
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.98	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	63	4	4	72	7	56	2	571	29	44	572	23
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	138	9	9	104	10	81	4	1333	68	64	1466	59
Arrive On Green	0.09	0.09	0.09	0.12	0.12	0.12	0.00	0.39	0.39	0.04	0.42	0.42
Sat Flow, veh/h	1567	100	100	902	88	702	1774	3423	174	1774	3464	139
Grp Volume(v), veh/h	71	0	0	135	0	0	2	295	305	44	292	303
Grp Sat Flow(s),veh/h/ln	1767	0	0	1692	0	0	1774	1770	1827	1774	1770	1833
Q Serve(g_s), s	2.1	0.0	0.0	4.1	0.0	0.0	0.1	6.6	6.6	1.3	6.1	6.2
Cycle Q Clear(g_c), s	2.1	0.0	0.0	4.1	0.0	0.0	0.1	6.6	6.6	1.3	6.1	6.2
Prop In Lane	0.89		0.06	0.53		0.41	1.00		0.10	1.00		0.08
Lane Grp Cap(c), veh/h	156	0	0	196	0	0	4	689	712	64	749	776
V/C Ratio(X)	0.46	0.00	0.00	0.69	0.00	0.00	0.51	0.43	0.43	0.69	0.39	0.39
Avail Cap(c_a), veh/h	888	0	0	850	0	0	135	689	712	158	749	776
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	0.0	0.0	22.9	0.0	0.0	26.9	12.1	12.1	25.7	10.7	10.7
Incr Delay (d2), s/veh	2.1	0.0	0.0	4.3	0.0	0.0	78.2	1.9	1.9	12.6	1.5	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	1.1	0.0	0.0	2.1	0.0	0.0	0.1	3.6	3.7	0.9	3.3	3.4
LnGrp Delay(d),s/veh	25.4	0.0	0.0	27.2	0.0	0.0	105.1	14.0	13.9	38.3	12.3	12.2
LnGrp LOS	C			C			F	B	B	D	B	B
Approach Vol, veh/h		71			135			602			639	
Approach Delay, s/veh		25.4			27.2			14.3			14.0	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	28.6		11.1	6.3	26.8		9.7
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	4.1	* 22		27.1	4.8	21.0		27.1
Max Q Clear Time (g_c+I1), s	2.1	8.2		6.1	3.3	8.6		4.1
Green Ext Time (p_c), s	0.0	2.7		0.6	0.0	2.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	82	26	8	520	494	90
Future Vol, veh/h	82	26	8	520	494	90
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	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	89	28	9	565	537	98

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	903	334	643	0	-	0
Stage 1	594	-	-	-	-	-
Stage 2	309	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	277	662	938	-	-	-
Stage 1	514	-	-	-	-	-
Stage 2	718	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	270	653	932	-	-	-
Mov Cap-2 Maneuver	386	-	-	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	713	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	932	-	428	-	-
HCM Lane V/C Ratio	0.009	-	0.274	-	-
HCM Control Delay (s)	8.9	-	16.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	1.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	22	356	3	36	33	318	185	13	18	217	277
Future Volume (veh/h)	305	22	356	3	36	33	318	185	13	18	217	277
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.97		0.98	1.00		0.97	1.00		0.98
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	359	26	419	4	42	39	374	218	15	21	255	326
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	597	615	499	337	175	162	445	1931	130	32	506	444
Arrive On Green	0.18	0.33	0.33	0.04	0.20	0.20	0.13	0.40	0.40	0.02	0.29	0.29
Sat Flow, veh/h	1774	1863	1513	1774	882	819	3442	4857	328	1774	1770	1552
Grp Volume(v), veh/h	359	26	419	4	0	81	374	151	82	21	255	326
Grp Sat Flow(s),veh/h/ln	1774	1863	1513	1774	0	1702	1721	1695	1795	1774	1770	1552
Q Serve(g_s), s	14.0	0.9	23.5	0.2	0.0	3.7	9.7	2.6	2.6	1.1	11.0	17.4
Cycle Q Clear(g_c), s	14.0	0.9	23.5	0.2	0.0	3.7	9.7	2.6	2.6	1.1	11.0	17.4
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	597	615	499	337	0	337	445	1348	713	32	506	444
V/C Ratio(X)	0.60	0.04	0.84	0.01	0.00	0.24	0.84	0.11	0.11	0.65	0.50	0.73
Avail Cap(c_a), veh/h	598	732	595	572	0	669	474	1348	713	107	506	444
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	20.8	28.4	26.4	0.0	30.9	38.9	17.4	17.4	44.7	27.3	29.5
Incr Delay (d2), s/veh	1.7	0.0	9.0	0.0	0.0	0.4	12.1	0.2	0.3	20.3	3.5	10.3
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	7.1	0.5	11.1	0.1	0.0	1.8	5.4	1.2	1.4	0.7	5.9	8.7
LnGrp Delay(d),s/veh	22.9	20.9	37.4	26.4	0.0	31.3	51.1	17.6	17.7	65.0	30.8	39.8
LnGrp LOS	C	C	D	C		C	D	B	B	E	C	D
Approach Vol, veh/h		804			85			607			602	
Approach Delay, s/veh		30.4			31.0			38.2			36.9	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	31.8	20.5	23.1	6.1	42.0	8.4	35.1
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	12.6	* 26	16.1	36.0	5.5	33.1	16.1	36.0
Max Q Clear Time (g_c+I1), s	11.7	19.4	16.0	5.7	3.1	4.6	2.2	25.5
Green Ext Time (p_c), s	0.1	1.9	0.0	0.4	0.0	1.3	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	34.6
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	4	10	0	42	3	460	6	26	546	4
Future Volume (veh/h)	3	0	4	10	0	42	3	460	6	26	546	4
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.96	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	3	0	4	11	0	47	3	511	7	29	607	4
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
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	17	0	23	75	0	67	6	2832	39	46	2974	20
Arrive On Green	0.02	0.00	0.02	0.04	0.00	0.04	0.00	0.55	0.55	0.03	0.57	0.57
Sat Flow, veh/h	704	0	939	1774	0	1583	1774	5167	71	1774	5211	34
Grp Volume(v), veh/h	7	0	0	11	0	47	3	335	183	29	395	216
Grp Sat Flow(s),veh/h/ln	1643	0	0	1774	0	1583	1774	1695	1847	1774	1695	1855
Q Serve(g_s), s	0.2	0.0	0.0	0.3	0.0	1.6	0.1	2.8	2.8	0.9	3.2	3.2
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.3	0.0	1.6	0.1	2.8	2.8	0.9	3.2	3.2
Prop In Lane	0.43		0.57	1.00		1.00	1.00		0.04	1.00		0.02
Lane Grp Cap(c), veh/h	40	0	0	75	0	67	6	1858	1012	46	1935	1059
V/C Ratio(X)	0.17	0.00	0.00	0.15	0.00	0.70	0.52	0.18	0.18	0.63	0.20	0.20
Avail Cap(c_a), veh/h	906	0	0	1013	0	904	145	1858	1012	240	1935	1059
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	0.0	25.9	0.0	26.6	28.0	6.4	6.4	27.1	5.9	5.9
Incr Delay (d2), s/veh	2.0	0.0	0.0	0.9	0.0	12.4	57.5	0.2	0.4	13.4	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.2	0.0	0.9	0.1	1.4	1.5	0.6	1.5	1.8
LnGrp Delay(d),s/veh	28.9	0.0	0.0	26.8	0.0	39.0	85.4	6.6	6.8	40.5	6.1	6.3
LnGrp LOS	C			C		D	F	A	A	D	A	A
Approach Vol, veh/h		7			58			521			640	
Approach Delay, s/veh		28.9			36.7			7.1			7.7	
Approach LOS		C			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.6	38.1		7.3	5.9	36.8		6.3
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	4.6	32.1		32.1	7.6	29.1		31.0
Max Q Clear Time (g_c+I1), s	2.1	5.2		3.6	2.9	4.8		2.2
Green Ext Time (p_c), s	0.0	3.6		0.2	0.0	3.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		9.0
HCM 2010 LOS		A

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	51	9	54	487	14	5	502
Future Volume (veh/h)	51	9	54	487	14	5	502
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.96	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	55	10		524	15	5	540
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.93	0.93		0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	86	77		3202	91	10	3716
Arrive On Green	0.05	0.05		0.63	0.63	0.01	0.73
Sat Flow, veh/h	1774	1583		5244	145	1774	5253
Grp Volume(v), veh/h	55	10		349	190	5	540
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1831	1774	1695
Q Serve(g_s), s	1.4	0.3		2.0	2.0	0.1	1.5
Cycle Q Clear(g_c), s	1.4	0.3		2.0	2.0	0.1	1.5
Prop In Lane	1.00	1.00			0.08	1.00	
Lane Grp Cap(c), veh/h	86	77		2138	1155	10	3716
V/C Ratio(X)	0.64	0.13		0.16	0.16	0.52	0.15
Avail Cap(c_a), veh/h	1156	1032		2138	1155	149	3716
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.2	21.7		3.6	3.6	23.6	1.9
Incr Delay (d2), s/veh	7.7	0.8		0.2	0.3	38.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3		1.0	1.1	0.2	0.7
LnGrp Delay(d),s/veh	29.9	22.4		3.8	3.9	61.7	2.0
LnGrp LOS	C	C		A	A	E	A
Approach Vol, veh/h	65			539			545
Approach Delay, s/veh	28.7			3.8			2.6
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		40.8		6.8	4.8	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		29.2		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		3.5		3.4	2.1	4.0		
Green Ext Time (p_c), s		3.4		0.1	0.0	3.1		

Intersection Summary	
HCM 2010 Ctrl Delay	4.6
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	5	257	1	67	5	347	553	152	487	1
Future Volume (veh/h)	0	0	5	257	1	67	5	347	553	152	487	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	0	5	279	1	73	5	377	601	165	529	1
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	2	190	96	503	502	418	12	1631	720	245	1859	803
Arrive On Green	0.00	0.00	0.05	0.15	0.27	0.27	0.01	0.46	0.46	0.07	0.53	0.53
Sat Flow, veh/h	1774	3539	1583	3442	1863	1551	1774	3539	1564	3442	3539	1528
Grp Volume(v), veh/h	0	0	5	279	1	73	5	377	601	165	529	1
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1551	1774	1770	1564	1721	1770	1528
Q Serve(g_s), s	0.0	0.0	0.2	5.6	0.0	2.7	0.2	4.8	25.3	3.5	6.3	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.2	5.6	0.0	2.7	0.2	4.8	25.3	3.5	6.3	0.0
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	2	190	96	503	502	418	12	1631	720	245	1859	803
V/C Ratio(X)	0.00	0.00	0.05	0.55	0.00	0.17	0.43	0.23	0.83	0.67	0.28	0.00
Avail Cap(c_a), veh/h	260	727	336	505	502	418	118	1631	720	262	1859	803
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)	0.00	0.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	33.2	29.7	20.0	21.0	37.1	12.2	17.7	34.0	9.9	8.5
Incr Delay (d2), s/veh	0.0	0.0	0.2	1.3	0.0	0.2	22.5	0.3	10.8	6.1	0.4	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	0.0	0.0	0.1	2.8	0.0	1.2	0.2	2.4	12.9	1.9	3.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	33.4	31.1	20.0	21.2	59.6	12.5	28.5	40.1	10.3	8.5
LnGrp LOS			C	C	C	C	E	B	C	D	B	A
Approach Vol, veh/h		5			353			983			695	
Approach Delay, s/veh		33.4			29.0			22.5			17.4	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	39.7	16.2	9.1	5.2	44.5	0.0	25.3
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 5.7	22.8	* 11	15.4	* 5	23.5	* 11	15.4
Max Q Clear Time (g_c+I1), s	5.5	27.3	7.6	2.2	2.2	8.3	0.0	4.7
Green Ext Time (p_c), s	0.0	0.0	0.3	0.0	0.0	2.8	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	21.9
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	21	0	59	276	812	0	0	246	469
Future Volume (veh/h)	0	0	0	21	0	59	276	812	0	0	246	469
Number				3	8	18	5	2	12	1	6	16
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		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				23	0	65	303	892	0	0	270	515
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
Peak Hour Factor				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	0	0	2	2
Cap, veh/h				103	0	92	325	4126	0	0	1925	870
Arrive On Green				0.06	0.00	0.06	0.18	0.81	0.00	0.00	0.57	0.57
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	3558	1532
Grp Volume(v), veh/h				23	0	65	303	892	0	0	270	515
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1695	1532
Q Serve(g_s), s				1.0	0.0	3.1	13.1	3.1	0.0	0.0	2.9	17.1
Cycle Q Clear(g_c), s				1.0	0.0	3.1	13.1	3.1	0.0	0.0	2.9	17.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				103	0	92	325	4126	0	0	1925	870
V/C Ratio(X)				0.22	0.00	0.71	0.93	0.22	0.00	0.00	0.14	0.59
Avail Cap(c_a), veh/h				350	0	313	325	4126	0	0	1925	870
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.70	0.70	0.00	0.00	0.95	0.95
Uniform Delay (d), s/veh				35.1	0.0	36.1	31.4	1.7	0.0	0.0	7.9	11.0
Incr Delay (d2), s/veh				1.1	0.0	9.7	25.7	0.1	0.0	0.0	0.1	2.8
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				0.5	0.0	1.6	8.7	1.4	0.0	0.0	1.4	7.8
LnGrp Delay(d),s/veh				36.2	0.0	45.8	57.0	1.8	0.0	0.0	8.1	13.8
LnGrp LOS				D		D	E	A			A	B
Approach Vol, veh/h					88			1195			785	
Approach Delay, s/veh					43.3			15.8			11.8	
Approach LOS					D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		68.4			19.0	49.4		9.6
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		21.9			* 14	32.9		15.4
Max Q Clear Time (g_c+I1), s		5.1			15.1	19.1		5.1
Green Ext Time (p_c), s		5.2			0.0	4.3		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	589	1	486	0	0	0	0	511	59	89	264	0
Future Volume (veh/h)	589	1	486	0	0	0	0	511	59	89	264	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	656	88	593				0	623	72	109	322	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
Peak Hour Factor	0.82	0.82	0.82				0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	755	89	598				0	1378	157	138	1553	0
Arrive On Green	0.43	0.43	0.43				0.00	0.30	0.30	0.08	0.44	0.00
Sat Flow, veh/h	1774	209	1406				0	4791	528	1774	3632	0
Grp Volume(v), veh/h	656	0	681				0	455	240	109	322	0
Grp Sat Flow(s),veh/h/ln	1774	0	1615				0	1695	1761	1774	1770	0
Q Serve(g_s), s	25.3	0.0	31.4				0.0	8.2	8.3	4.5	4.2	0.0
Cycle Q Clear(g_c), s	25.3	0.0	31.4				0.0	8.2	8.3	4.5	4.2	0.0
Prop In Lane	1.00		0.87				0.00		0.30	1.00		0.00
Lane Grp Cap(c), veh/h	755	0	687				0	1010	525	138	1553	0
V/C Ratio(X)	0.87	0.00	0.99				0.00	0.45	0.46	0.79	0.21	0.00
Avail Cap(c_a), veh/h	755	0	687				0	1010	525	149	1553	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.96	0.96	0.00
Uniform Delay (d), s/veh	19.7	0.0	21.4				0.0	21.3	21.4	34.0	13.0	0.0
Incr Delay (d2), s/veh	10.7	0.0	32.1				0.0	1.5	2.9	21.7	0.3	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
%ile BackOfQ(50%),veh/ln	14.4	0.0	19.9				0.0	4.0	4.4	3.0	2.1	0.0
LnGrp Delay(d),s/veh	30.3	0.0	53.6				0.0	22.8	24.3	55.7	13.3	0.0
LnGrp LOS	C		D					C	C	E	B	
Approach Vol, veh/h		1337						695			431	
Approach Delay, s/veh		42.2						23.3			24.0	
Approach LOS		D						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	10.6	27.4		37.0		38.0		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 6.3	21.9		31.9		32.9		
Max Q Clear Time (g_c+I1), s	6.5	10.3		33.4		6.2		
Green Ext Time (p_c), s	0.0	3.2		0.0		1.9		

Intersection Summary		
HCM 2010 Ctrl Delay		33.7
HCM 2010 LOS		C

Notes

LOS Engineering, Inc.

Intersection	
Intersection Delay, s/veh	124.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	365	1	7	0	1	55	4	195	0	33	277	425
Future Vol, veh/h	365	1	7	0	1	55	4	195	0	33	277	425
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	537	1	10	0	1	81	6	287	0	49	407	625
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	29.4	15.3	16.2	210.9
HCM LOS	D	C	C	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	96%	0%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	100%	0%	1%	100%	100%	0%	0%	100%	18%
Vol Right, %	0%	0%	0%	0%	4%	0%	0%	100%	0%	0%	82%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	98	98	186	187	0	1	55	33	185	517
LT Vol	4	0	0	186	179	0	0	0	33	0	0
Through Vol	0	98	98	0	1	0	1	0	0	185	92
RT Vol	0	0	0	0	7	0	0	55	0	0	425
Lane Flow Rate	6	143	143	274	275	0	1	81	49	272	761
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.016	0.365	0.296	0.67	0.669	0	0.004	0.206	0.116	0.609	1.581
Departure Headway (Hd)	10.512	9.992	8.189	9.5	9.452	10.735	10.735	10.016	8.588	8.074	7.483
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	343	363	442	383	385	0	335	361	418	448	487
Service Time	8.212	7.692	5.889	7.2	7.152	8.435	8.435	7.716	6.331	5.816	5.225
HCM Lane V/C Ratio	0.017	0.394	0.324	0.715	0.714	0	0.003	0.224	0.117	0.607	1.563
HCM Control Delay	13.4	18.3	14.3	29.5	29.3	13.4	13.5	15.3	12.5	22.7	290.8
HCM Lane LOS	B	C	B	D	D	N	B	C	B	C	F
HCM 95th-tile Q	0	1.6	1.2	4.7	4.7	0	0	0.8	0.4	4	41.6

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑	↱		↱
Traffic Vol, veh/h	0	705	253	1	35	72
Future Vol, veh/h	0	705	253	1	35	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	400	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	775	278	1	38	79

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	588	139
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	310	-
Critical Hdwy	-	-	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	0	-	-	-	496	751
Stage 1	0	-	-	-	652	-
Stage 2	0	-	-	-	657	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	496	751
Mov Cap-2 Maneuver	-	-	-	-	496	-
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	657	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	751
HCM Lane V/C Ratio	-	-	-	0.105
HCM Control Delay (s)	-	-	-	10.4
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.4

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	325	320	1	197	38	28	88
Future Volume (veh/h)	325	320	1	197	38	28	88
Number	5	2		6	16	7	14
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00				1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1863	1863	1863
Adj Flow Rate, veh/h	365	360		221	43	31	99
Adj No. of Lanes	2	3		3	1	1	2
Peak Hour Factor	0.89	0.89		0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	488	1691		697	216	915	1438
Arrive On Green	0.14	0.33		0.14	0.14	0.52	0.52
Sat Flow, veh/h	3442	5253		5253	1578	1774	2787
Grp Volume(v), veh/h	365	360		221	43	31	99
Grp Sat Flow(s),veh/h/ln	1721	1695		1695	1578	1774	1393
Q Serve(g_s), s	7.6	3.8		2.9	1.8	0.6	1.3
Cycle Q Clear(g_c), s	7.6	3.8		2.9	1.8	0.6	1.3
Prop In Lane	1.00				1.00	1.00	1.00
Lane Grp Cap(c), veh/h	488	1691		697	216	915	1438
V/C Ratio(X)	0.75	0.21		0.32	0.20	0.03	0.07
Avail Cap(c_a), veh/h	1015	3490		2352	730	915	1438
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	30.7	17.9		29.0	28.6	8.9	9.1
Incr Delay (d2), s/veh	2.3	0.1		0.3	0.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	1.8		1.4	0.8	0.3	1.5
LnGrp Delay(d),s/veh	33.1	17.9		29.3	29.0	9.0	9.2
LnGrp LOS	C	B		C	C	A	A
Approach Vol, veh/h		725		264		130	
Approach Delay, s/veh		25.6		29.2		9.1	
Approach LOS		C		C		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		32.1		42.5	14.6	17.5		
Change Period (Y+Rc), s		7.3		4.0	4.0	* 7.3		
Max Green Setting (Gmax), s		51.2		38.5	22.0	* 35		
Max Q Clear Time (g_c+I1), s		5.8		3.3	9.6	4.9		
Green Ext Time (p_c), s		2.3		0.4	1.0	1.5		

Intersection Summary	
HCM 2010 Ctrl Delay	24.5
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	430	3	0	272	34	0	0	5	0	0	47
Future Vol, veh/h	0	430	3	0	272	34	0	0	5	0	0	47
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	467	3	0	296	37	0	0	5	0	0	51

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	235	-	-	148
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	653	0	0	741
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	653	-	-	741
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.6	10.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	653	-	-	-	-	741
HCM Lane V/C Ratio	0.008	-	-	-	-	0.069
HCM Control Delay (s)	10.6	-	-	-	-	10.2
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	118	105	37	137	116	54	33	38	86	23	63
Future Volume (veh/h)	126	118	105	37	137	116	54	33	38	86	23	63
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	135	127	113	40	147	125	58	35	41	92	25	68
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	778	239	106	613	191	74	348	407	118	880	1316
Arrive On Green	0.06	0.15	0.15	0.03	0.12	0.12	0.04	0.45	0.45	0.07	0.47	0.47
Sat Flow, veh/h	3442	5085	1562	3442	5085	1583	1774	777	910	1774	1863	2787
Grp Volume(v), veh/h	135	127	113	40	147	125	58	0	76	92	25	68
Grp Sat Flow(s),veh/h/ln	1721	1695	1562	1721	1695	1583	1774	0	1687	1774	1863	1393
Q Serve(g_s), s	2.7	1.5	4.7	0.8	1.8	5.3	2.3	0.0	1.8	3.6	0.5	0.9
Cycle Q Clear(g_c), s	2.7	1.5	4.7	0.8	1.8	5.3	2.3	0.0	1.8	3.6	0.5	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	218	778	239	106	613	191	74	0	755	118	880	1316
V/C Ratio(X)	0.62	0.16	0.47	0.38	0.24	0.66	0.79	0.00	0.10	0.78	0.03	0.05
Avail Cap(c_a), veh/h	415	2960	909	220	2671	832	227	0	755	176	880	1316
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	25.9	27.2	33.5	28.1	29.6	33.4	0.0	11.3	32.4	9.9	10.1
Incr Delay (d2), s/veh	2.8	0.1	1.5	2.2	0.2	3.8	16.6	0.0	0.3	12.0	0.1	0.1
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	1.4	0.7	2.1	0.4	0.9	2.5	1.5	0.0	0.9	2.2	0.3	0.4
LnGrp Delay(d),s/veh	35.0	26.0	28.7	35.7	28.3	33.4	50.0	0.0	11.5	44.4	10.0	10.1
LnGrp LOS	C	C	C	D	C	C	D		B	D	B	B
Approach Vol, veh/h		375			312			134			185	
Approach Delay, s/veh		30.1			31.3			28.2			27.1	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	40.7	8.5	14.4	8.7	38.9	6.2	16.7
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	9.0	29.2	8.5	37.0	7.0	* 32	4.5	41.0
Max Q Clear Time (g_c+I1), s	4.3	2.9	4.7	7.3	5.6	3.8	2.8	6.7
Green Ext Time (p_c), s	0.0	0.3	0.1	1.2	0.0	0.3	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	29.6
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	1	4	13	0	53	4	563	25	147	471	20
Future Volume (veh/h)	14	1	4	13	0	53	4	563	25	147	471	20
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.99	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	16	1	5	15	0	60	5	640	28	167	535	23
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	46	3	14	29	0	116	10	1248	55	211	1642	71
Arrive On Green	0.04	0.04	0.04	0.09	0.00	0.09	0.01	0.36	0.36	0.12	0.48	0.48
Sat Flow, veh/h	1258	79	393	324	0	1294	1774	3454	151	1774	3456	148
Grp Volume(v), veh/h	22	0	0	75	0	0	5	328	340	167	274	284
Grp Sat Flow(s),veh/h/ln	1730	0	0	1618	0	0	1774	1770	1835	1774	1770	1835
Q Serve(g_s), s	0.6	0.0	0.0	2.3	0.0	0.0	0.1	7.4	7.4	4.7	4.9	4.9
Cycle Q Clear(g_c), s	0.6	0.0	0.0	2.3	0.0	0.0	0.1	7.4	7.4	4.7	4.9	4.9
Prop In Lane	0.73		0.23	0.20		0.80	1.00		0.08	1.00		0.08
Lane Grp Cap(c), veh/h	64	0	0	145	0	0	10	639	663	211	841	872
V/C Ratio(X)	0.35	0.00	0.00	0.52	0.00	0.00	0.53	0.51	0.51	0.79	0.33	0.33
Avail Cap(c_a), veh/h	918	0	0	858	0	0	143	639	663	265	841	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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	0.0	22.1	0.0	0.0	25.3	12.7	12.7	21.8	8.3	8.3
Incr Delay (d2), s/veh	3.2	0.0	0.0	2.8	0.0	0.0	38.4	2.9	2.8	12.0	1.0	1.0
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	0.4	0.0	0.0	1.1	0.0	0.0	0.2	4.1	4.2	3.0	2.6	2.7
LnGrp Delay(d),s/veh	27.1	0.0	0.0	24.9	0.0	0.0	63.6	15.7	15.6	33.8	9.3	9.3
LnGrp LOS	C			C			E	B	B	C	A	A
Approach Vol, veh/h		22			75			673			725	
Approach Delay, s/veh		27.1			24.9			16.0			14.9	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	30.0		9.5	10.5	24.2		6.8
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	4.1	* 22		27.0	7.6	18.4		27.0
Max Q Clear Time (g_c+I1), s	2.1	6.9		4.3	6.7	9.4		2.6
Green Ext Time (p_c), s	0.0	2.6		0.3	0.0	2.5		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Notes

LOS Engineering, Inc.

Intersection						
Int Delay, s/veh	0.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	22	21	548	447	50
Future Vol, veh/h	37	22	21	548	447	50
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	26	24	637	520	58

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	932	305	586	0	-	0
Stage 1	557	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	265	691	985	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	255	682	978	-	-	-
Mov Cap-2 Maneuver	376	-	-	-	-	-
Stage 1	520	-	-	-	-	-
Stage 2	660	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	978	-	452	-	-
HCM Lane V/C Ratio	0.025	-	0.152	-	-
HCM Control Delay (s)	8.8	-	14.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	2	77	4	3	20	115	446	11	35	283	153
Future Volume (veh/h)	99	2	77	4	3	20	115	446	11	35	283	153
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.97	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	121	2	94	5	4	24	140	544	13	43	345	187
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	415	293	246	366	29	173	229	2381	57	58	964	512
Arrive On Green	0.09	0.16	0.16	0.06	0.12	0.12	0.07	0.47	0.47	0.03	0.43	0.43
Sat Flow, veh/h	1774	1863	1562	1774	231	1384	3442	5105	122	1774	2226	1183
Grp Volume(v), veh/h	121	2	94	5	0	28	140	361	196	43	273	259
Grp Sat Flow(s),veh/h/ln	1774	1863	1562	1774	0	1615	1721	1695	1837	1774	1770	1639
Q Serve(g_s), s	3.9	0.1	3.6	0.2	0.0	1.0	2.7	4.3	4.3	1.6	6.9	7.2
Cycle Q Clear(g_c), s	3.9	0.1	3.6	0.2	0.0	1.0	2.7	4.3	4.3	1.6	6.9	7.2
Prop In Lane	1.00		1.00	1.00		0.86	1.00		0.07	1.00		0.72
Lane Grp Cap(c), veh/h	415	293	246	366	0	202	229	1581	857	58	766	710
V/C Ratio(X)	0.29	0.01	0.38	0.01	0.00	0.14	0.61	0.23	0.23	0.74	0.36	0.37
Avail Cap(c_a), veh/h	696	1000	839	691	0	855	492	1581	857	201	766	710
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	23.9	25.4	22.6	0.0	26.2	30.5	10.7	10.7	32.2	12.8	12.8
Incr Delay (d2), s/veh	0.4	0.0	1.0	0.0	0.0	0.3	2.7	0.3	0.6	16.5	1.3	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	1.9	0.0	1.6	0.1	0.0	0.5	1.3	2.1	2.3	1.1	3.6	3.5
LnGrp Delay(d),s/veh	22.7	23.9	26.4	22.6	0.0	26.5	33.2	11.0	11.3	48.7	14.1	14.3
LnGrp LOS	C	C	C	C		C	C	B	B	D	B	B
Approach Vol, veh/h		217			33			697			575	
Approach Delay, s/veh		24.3			25.9			15.6			16.8	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	34.7	10.4	13.3	6.6	37.0	8.2	15.5
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	9.6	* 29	16.6	35.6	7.6	30.9	16.1	36.1
Max Q Clear Time (g_c+I1), s	4.7	9.2	5.9	3.0	3.6	6.3	2.2	5.6
Green Ext Time (p_c), s	0.2	2.9	0.2	0.1	0.0	3.2	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	17.5
HCM 2010 LOS	B

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	5	13	0	28	1	559	21	45	321	0
Future Volume (veh/h)	3	0	5	13	0	28	1	559	21	45	321	0
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	4	0	6	17	0	36	1	717	27	58	412	0
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	15	0	23	78	0	70	3	2680	101	75	2922	0
Arrive On Green	0.02	0.00	0.02	0.04	0.00	0.04	0.00	0.53	0.53	0.04	0.57	0.00
Sat Flow, veh/h	656	0	985	1774	0	1577	1774	5024	189	1774	5253	0
Grp Volume(v), veh/h	10	0	0	17	0	36	1	483	261	58	412	0
Grp Sat Flow(s),veh/h/ln	1641	0	0	1774	0	1577	1774	1695	1822	1774	1695	0
Q Serve(g_s), s	0.3	0.0	0.0	0.5	0.0	1.3	0.0	4.4	4.4	1.8	2.1	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.5	0.0	1.3	0.0	4.4	4.4	1.8	2.1	0.0
Prop In Lane	0.40		0.60	1.00		1.00	1.00		0.10	1.00		0.00
Lane Grp Cap(c), veh/h	38	0	0	78	0	70	3	1808	972	75	2922	0
V/C Ratio(X)	0.26	0.00	0.00	0.22	0.00	0.52	0.32	0.27	0.27	0.77	0.14	0.00
Avail Cap(c_a), veh/h	899	0	0	1007	0	895	132	1808	972	301	2922	0
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.2	0.0	0.0	26.1	0.0	26.4	28.2	7.2	7.2	26.8	5.6	0.0
Incr Delay (d2), s/veh	3.7	0.0	0.0	1.4	0.0	5.8	49.9	0.4	0.7	15.4	0.1	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	0.2	0.0	0.0	0.3	0.0	0.7	0.1	2.1	2.4	1.2	1.0	0.0
LnGrp Delay(d),s/veh	30.8	0.0	0.0	27.5	0.0	32.3	78.1	7.5	7.9	42.2	5.7	0.0
LnGrp LOS	C			C		C	E	A	A	D	A	
Approach Vol, veh/h		10			53			745			470	
Approach Delay, s/veh		30.8			30.7			7.8			10.2	
Approach LOS		C			C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	38.5		7.4	6.8	36.2		6.2
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	4.2	32.5		32.1	9.6	27.1		31.0
Max Q Clear Time (g_c+I1), s	2.0	4.1		3.3	3.8	6.4		2.3
Green Ext Time (p_c), s	0.0	2.6		0.2	0.0	4.3		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		9.8
HCM 2010 LOS		A

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	27	9	33	566	48	8	331
Future Volume (veh/h)	27	9	33	566	48	8	331
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.97	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	35	12		735	62	10	430
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.77	0.77		0.77	0.77	0.77	0.77
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	69	62		3022	253	18	3759
Arrive On Green	0.04	0.04		0.63	0.63	0.01	0.74
Sat Flow, veh/h	1774	1583		4936	400	1774	5253
Grp Volume(v), veh/h	35	12		521	276	10	430
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1778	1774	1695
Q Serve(g_s), s	0.9	0.3		3.1	3.2	0.3	1.1
Cycle Q Clear(g_c), s	0.9	0.3		3.1	3.2	0.3	1.1
Prop In Lane	1.00	1.00			0.22	1.00	
Lane Grp Cap(c), veh/h	69	62		2149	1127	18	3759
V/C Ratio(X)	0.51	0.19		0.24	0.24	0.54	0.11
Avail Cap(c_a), veh/h	1162	1037		2149	1127	150	3759
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.3	22.0		3.8	3.8	23.3	1.8
Incr Delay (d2), s/veh	5.6	1.5		0.3	0.5	22.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.3		1.5	1.7	0.2	0.5
LnGrp Delay(d),s/veh	27.9	23.5		4.0	4.3	45.7	1.8
LnGrp LOS	C	C		A	A	D	A
Approach Vol, veh/h	47			797			440
Approach Delay, s/veh	26.8			4.1			2.8
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.0		6.3	5.0	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		29.5		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		3.1		2.9	2.3	5.2		
Green Ext Time (p_c), s		2.7		0.1	0.0	4.9		

Intersection Summary	
HCM 2010 Ctrl Delay	4.5
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	16	697	7	198	22	486	311	124	228	0
Future Volume (veh/h)	2	0	16	697	7	198	22	486	311	124	228	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	2	0	18	774	8	220	24	540	346	138	253	0
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
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	11	220	139	844	562	466	46	1343	981	212	1470	658
Arrive On Green	0.01	0.00	0.06	0.25	0.30	0.30	0.03	0.38	0.38	0.06	0.42	0.00
Sat Flow, veh/h	1774	3539	1583	3442	1863	1546	1774	3539	1562	3442	3539	1583
Grp Volume(v), veh/h	2	0	18	774	8	220	24	540	346	138	253	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1546	1774	1770	1562	1721	1770	1583
Q Serve(g_s), s	0.1	0.0	0.8	17.5	0.2	9.3	1.1	8.9	8.5	3.1	3.6	0.0
Cycle Q Clear(g_c), s	0.1	0.0	0.8	17.5	0.2	9.3	1.1	8.9	8.5	3.1	3.6	0.0
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	11	220	139	844	562	466	46	1343	981	212	1470	658
V/C Ratio(X)	0.19	0.00	0.13	0.92	0.01	0.47	0.52	0.40	0.35	0.65	0.17	0.00
Avail Cap(c_a), veh/h	244	606	312	852	562	466	111	1343	981	271	1470	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	0.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.6	0.0	33.6	29.4	19.6	22.7	38.5	18.2	7.2	36.7	14.7	0.0
Incr Delay (d2), s/veh	8.3	0.0	0.4	14.5	0.0	0.7	8.8	0.9	1.0	3.5	0.3	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	0.1	0.0	0.4	10.0	0.1	4.1	0.6	4.5	3.9	1.6	1.8	0.0
LnGrp Delay(d),s/veh	47.9	0.0	34.1	43.9	19.6	23.5	47.3	19.1	8.2	40.2	15.0	0.0
LnGrp LOS	D		C	D	B	C	D	B	A	D	B	
Approach Vol, veh/h		20			1002			910			391	
Approach Delay, s/veh		35.4			39.2			15.7			23.9	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	35.5	24.8	10.1	6.8	38.3	5.7	29.2
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 6.3	20.1	* 20	13.7	* 5	21.4	* 11	22.5
Max Q Clear Time (g_c+I1), s	5.1	10.9	19.5	2.8	3.1	5.6	2.1	11.3
Green Ext Time (p_c), s	0.0	3.1	0.1	0.0	0.0	1.2	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	27.4
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	36	0	84	458	790	0	0	220	684
Future Volume (veh/h)	0	0	0	36	0	84	458	790	0	0	220	684
Number				3	8	18	5	2	12	1	6	16
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		0.91
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				43	0	101	552	952	0	0	265	824
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
Peak Hour Factor				0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				139	0	124	503	4302	0	0	1788	760
Arrive On Green				0.08	0.00	0.08	0.28	0.85	0.00	0.00	0.53	0.53
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	3558	1441
Grp Volume(v), veh/h				43	0	101	552	952	0	0	265	824
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1695	1441
Q Serve(g_s), s				3.1	0.0	8.5	38.3	4.8	0.0	0.0	5.4	71.2
Cycle Q Clear(g_c), s				3.1	0.0	8.5	38.3	4.8	0.0	0.0	5.4	71.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				139	0	124	503	4302	0	0	1788	760
V/C Ratio(X)				0.31	0.00	0.81	1.10	0.22	0.00	0.00	0.15	1.08
Avail Cap(c_a), veh/h				204	0	182	503	4302	0	0	1788	760
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.55	0.55	0.00	0.00	0.71	0.71
Uniform Delay (d), s/veh				58.7	0.0	61.2	48.3	2.0	0.0	0.0	16.4	31.9
Incr Delay (d2), s/veh				1.2	0.0	15.9	59.8	0.1	0.0	0.0	0.1	53.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.6	0.0	4.3	27.1	2.2	0.0	0.0	2.6	39.5
LnGrp Delay(d),s/veh				60.0	0.0	77.1	108.2	2.0	0.0	0.0	16.5	85.2
LnGrp LOS				E		E	F	A			B	F
Approach Vol, veh/h					144			1504			1089	
Approach Delay, s/veh					72.0			41.0			68.5	
Approach LOS					E			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		119.3			43.0	76.3		15.7
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		109.3			* 38	66.3		15.5
Max Q Clear Time (g_c+I1), s		6.8			40.3	73.2		10.5
Green Ext Time (p_c), s		7.5			0.0	0.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	53.6
HCM 2010 LOS	D

Notes

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	565	4	322	0	0	0	0	681	76	98	170	0
Future Volume (veh/h)	565	4	322	0	0	0	0	681	76	98	170	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	602	232	435				0	920	103	132	230	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
Peak Hour Factor	0.74	0.74	0.74				0.74	0.74	0.74	0.74	0.74	0.74
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	754	247	463				0	1370	153	165	1583	0
Arrive On Green	0.43	0.43	0.43				0.00	0.30	0.30	0.09	0.45	0.00
Sat Flow, veh/h	1774	581	1089				0	4804	517	1774	3632	0
Grp Volume(v), veh/h	602	0	667				0	672	351	132	230	0
Grp Sat Flow(s),veh/h/ln	1774	0	1670				0	1695	1763	1774	1770	0
Q Serve(g_s), s	23.6	0.0	30.6				0.0	13.9	14.0	5.8	3.1	0.0
Cycle Q Clear(g_c), s	23.6	0.0	30.6				0.0	13.9	14.0	5.8	3.1	0.0
Prop In Lane	1.00		0.65				0.00		0.29	1.00		0.00
Lane Grp Cap(c), veh/h	754	0	710				0	1002	521	165	1583	0
V/C Ratio(X)	0.80	0.00	0.94				0.00	0.67	0.67	0.80	0.15	0.00
Avail Cap(c_a), veh/h	774	0	729				0	1002	521	184	1583	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.79	0.79	0.00
Uniform Delay (d), s/veh	20.0	0.0	22.0				0.0	24.8	24.8	35.6	13.1	0.0
Incr Delay (d2), s/veh	5.8	0.0	19.7				0.0	3.6	6.8	16.4	0.2	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
%ile BackOfQ(50%),veh/ln	12.7	0.0	17.8				0.0	7.0	7.8	3.6	1.5	0.0
LnGrp Delay(d),s/veh	25.8	0.0	41.7				0.0	28.3	31.6	51.9	13.2	0.0
LnGrp LOS	C		D					C	C	D	B	
Approach Vol, veh/h		1269						1023			362	
Approach Delay, s/veh		34.1						29.4			27.3	
Approach LOS		C						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	12.1	28.7		39.1		40.9		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 8.3	21.9		34.9		34.9		
Max Q Clear Time (g_c+I1), s	7.8	16.0		32.6		5.1		
Green Ext Time (p_c), s	0.0	3.0		1.5		1.3		

Intersection Summary		
HCM 2010 Ctrl Delay		31.4
HCM 2010 LOS		C

Notes

Intersection	
Intersection Delay, s/veh	27.4
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	326	5	7	4	2	110	5	308	6	92	171	192
Future Vol, veh/h	326	5	7	4	2	110	5	308	6	92	171	192
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	459	7	10	6	3	155	7	434	8	130	241	270
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	26.6	18.9	29	29
HCM LOS	D	C	D	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	93%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	94%	0%	3%	0%	100%	0%	0%	100%	23%
Vol Right, %	0%	0%	6%	0%	4%	0%	0%	100%	0%	0%	77%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	205	109	170	168	4	2	110	92	114	249
LT Vol	5	0	0	170	156	4	0	0	92	0	0
Through Vol	0	205	103	0	5	0	2	0	0	114	57
RT Vol	0	0	6	0	7	0	0	110	0	0	192
Lane Flow Rate	7	289	153	239	237	6	3	155	130	161	351
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.019	0.748	0.394	0.627	0.619	0.017	0.008	0.416	0.339	0.397	0.813
Departure Headway (Hd)	9.828	9.315	9.275	9.455	9.391	10.887	10.374	9.655	9.415	8.902	8.348
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	364	388	387	382	384	328	344	372	382	405	435
Service Time	7.598	7.084	7.045	7.217	7.152	8.666	8.152	7.433	7.177	6.664	6.11
HCM Lane V/C Ratio	0.019	0.745	0.395	0.626	0.617	0.018	0.009	0.417	0.34	0.398	0.807
HCM Control Delay	12.8	35.2	18	26.9	26.3	13.9	13.2	19.2	17	17.4	38.7
HCM Lane LOS	B	E	C	D	D	B	B	C	C	C	E
HCM 95th-tile Q	0.1	6	1.8	4.1	4	0.1	0	2	1.5	1.9	7.5

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	435	860	16	20	42
Future Vol, veh/h	0	435	860	16	20	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	400	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	478	945	18	22	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	1136	473
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	191	-
Critical Hdwy	-	-	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	0	-	-	-	265	460
Stage 1	0	-	-	-	261	-
Stage 2	0	-	-	-	756	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	265	460
Mov Cap-2 Maneuver	-	-	-	-	265	-
Stage 1	-	-	-	-	261	-
Stage 2	-	-	-	-	756	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	460
HCM Lane V/C Ratio	-	-	-	0.1
HCM Control Delay (s)	-	-	-	13.7
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.3

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	161	239	19	548	70	117	337
Future Volume (veh/h)	161	239	19	548	70	117	337
Number	5	2		6	16	7	14
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00				1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1863	1863	1863
Adj Flow Rate, veh/h	181	269		616	79	131	379
Adj No. of Lanes	2	3		3	1	1	2
Peak Hour Factor	0.89	0.89		0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	283	1680		988	308	918	1443
Arrive On Green	0.08	0.33		0.19	0.19	0.52	0.52
Sat Flow, veh/h	3442	5253		5253	1583	1774	2787
Grp Volume(v), veh/h	181	269		616	79	131	379
Grp Sat Flow(s),veh/h/ln	1721	1695		1695	1583	1774	1393
Q Serve(g_s), s	3.8	2.8		8.3	3.1	2.9	5.6
Cycle Q Clear(g_c), s	3.8	2.8		8.3	3.1	2.9	5.6
Prop In Lane	1.00				1.00	1.00	1.00
Lane Grp Cap(c), veh/h	283	1680		988	308	918	1443
V/C Ratio(X)	0.64	0.16		0.62	0.26	0.14	0.26
Avail Cap(c_a), veh/h	1018	3501		2359	735	918	1443
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	33.1	17.6		27.5	25.4	9.3	10.0
Incr Delay (d2), s/veh	2.4	0.0		0.6	0.4	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	1.3		3.9	1.4	1.5	5.9
LnGrp Delay(d),s/veh	35.5	17.7		28.1	25.8	9.7	10.5
LnGrp LOS	D	B		C	C	A	B
Approach Vol, veh/h		450		695		510	
Approach Delay, s/veh		24.8		27.8		10.2	
Approach LOS		C		C		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		31.9		42.5	10.1	21.8		
Change Period (Y+Rc), s		7.3		4.0	4.0	* 7.3		
Max Green Setting (Gmax), s		51.2		38.5	22.0	* 35		
Max Q Clear Time (g_c+I1), s		4.8		7.6	5.8	10.3		
Green Ext Time (p_c), s		1.7		1.9	0.5	4.2		

Intersection Summary	
HCM 2010 Ctrl Delay	21.6
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	361	5	0	554	29	0	0	5	0	0	113
Future Vol, veh/h	0	361	5	0	554	29	0	0	5	0	0	113
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	392	5	0	602	32	0	0	5	0	0	123

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	199	-	-	301
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	688	0	0	593
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	688	-	-	593
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.3	12.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	688	-	-	-	-	593
HCM Lane V/C Ratio	0.008	-	-	-	-	0.207
HCM Control Delay (s)	10.3	-	-	-	-	12.7
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	183	67	24	246	155	123	33	43	197	56	223
Future Volume (veh/h)	116	183	67	24	246	155	123	33	43	197	56	223
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	130	206	75	27	276	174	138	37	48	221	63	251
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	204	984	301	77	797	244	174	279	362	257	797	1191
Arrive On Green	0.06	0.19	0.19	0.02	0.16	0.16	0.10	0.38	0.38	0.14	0.43	0.43
Sat Flow, veh/h	3442	5085	1556	3442	5085	1556	1774	732	949	1774	1863	2783
Grp Volume(v), veh/h	130	206	75	27	276	174	138	0	85	221	63	251
Grp Sat Flow(s),veh/h/ln	1721	1695	1556	1721	1695	1556	1774	0	1681	1774	1863	1391
Q Serve(g_s), s	3.1	2.8	3.4	0.6	4.0	8.8	6.3	0.0	2.7	10.1	1.7	4.7
Cycle Q Clear(g_c), s	3.1	2.8	3.4	0.6	4.0	8.8	6.3	0.0	2.7	10.1	1.7	4.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	204	984	301	77	797	244	174	0	641	257	797	1191
V/C Ratio(X)	0.64	0.21	0.25	0.35	0.35	0.71	0.79	0.00	0.13	0.86	0.08	0.21
Avail Cap(c_a), veh/h	354	2524	772	187	2278	697	346	0	641	258	797	1191
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.0	28.0	28.2	39.8	31.1	33.1	36.4	0.0	16.7	34.5	14.0	14.9
Incr Delay (d2), s/veh	3.3	0.1	0.4	2.7	0.3	3.9	7.8	0.0	0.4	24.1	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.3	1.5	0.3	1.9	4.0	3.4	0.0	1.3	6.6	0.9	1.9
LnGrp Delay(d),s/veh	41.3	28.1	28.7	42.5	31.3	36.9	44.3	0.0	17.1	58.6	14.2	15.3
LnGrp LOS	D	C	C	D	C	D	D		B	E	B	B
Approach Vol, veh/h		411			477			223			535	
Approach Delay, s/veh		32.4			34.0			33.9			33.0	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	42.8	8.9	18.8	16.0	38.9	5.8	21.9
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	16.1	27.1	8.5	37.0	12.0	* 32	4.5	41.0
Max Q Clear Time (g_c+I1), s	8.3	6.7	5.1	10.8	12.1	4.7	2.6	5.4
Green Ext Time (p_c), s	0.2	1.2	0.1	2.2	0.0	0.4	0.0	1.5

Intersection Summary		
HCM 2010 Ctrl Delay		33.3
HCM 2010 LOS		C

Notes

Appendix J

Street B Letter of Permissions, Handler Conditions and Otay Mesa/Emerald Crest/Street B Signal Warrant Calculations

THE CITY OF SAN DIEGO

For:

The City of San Diego
Development Services Department
Land Development Review Division

1222 First Avenue, M.S. 501
San Diego, CA 92101-4155

WWW.Sandiego.Gov

LETTER OF PERMISSION FOR OFFSITE GRADING/IMPROVEMENTS

P.T.S. PROJECT NUMBER: 605191 | WORK ORDER NUMBER: 24007824

PORTIONS OF THE NE 1/4 OF THE NW 1/4 OF SEC 32, T18S, R1W (Owner)
(*Legal Description/Address-Owner*)

which is adjacent to PORTIONS OF THE NW 1/4 OF THE NW 1/4 OF SEC 32, T18S, R1W (Applicant)
(*Legal Description/Address -Applicant*)

and have reviewed the proposed grading/improvements as shown on City of San Diego Drawing No. VTM 2152396, with the above referenced Project Tracking System (PTS) number, and do hereby grant permission for the City of San Diego to issue a permit for the grading/improvements to be performed and/or constructed by (*Owner/Developer*) PARDEE HOMES on property as shown thereon.

The grading/improvements for which permission is granted can be more particularly described as:

Grading associated with construction of a public street known as Emerald Crest Court as shown on VTM 215396.

Owner:

GERALD HANDLER TRUSTEE
Print Name

Title

HANDLER TRUST 8/27/1983
Company

Gerald Handler 12-7-2018
Signature | Date

This information is available in alternative formats for persons with disabilities, upon request.

Printed on recycled paper.

THE CITY OF SAN DIEGO

For:

The City of San Diego
Development Services Department
Building, Safety, & Construction

1222 First Avenue, M.S. 501
San Diego, CA 92101-4155

LETTER OF PERMISSION FOR OFFSITE GRADING/IMPROVEMENTS

PROJECT NUMBER: 39191

INTERNAL ORDER NUMBER: 24006395

I am the owner of A portion of NW 1/4 of the NW 1/4 in Sec. 34, T 18 S, R 1 W (Owner)
(Legal Description/Address-Owner)

which is adjacent to A portion of NE 1/4 of the NW 1/4 in Sec. 32 T 18 S, R 1 W/Emerald Crest Ct (Handler Commercial), City of San Diego (Applicant)
(Legal Description/Address -Applicant)

has reviewed the proposed grading/improvements as shown on City of San Diego Drawing No. 39191-12 & -19-D, with the above referenced project number, and do hereby grant permission for the City of San Diego to issue a permit for the grading/improvements to be performed and/or constructed by
Dr. Gerald Handler *(Owner/Developer)* on property as shown thereon.

The grading/improvements for which permission is granted can be more particularly described as:

Grading associated with construction of a public street known as Emerald Crest Court.

Owner:

Print Name **Jimmy Ayala**

Division President

Title

PARDEE HOMES

Company

Signature

4.19.18

Date

This information is available in alternative formats for persons with disabilities, upon request.

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Page 1 of 1

1

CONDITIONS FOR VESTING TENTATIVE MAP NO. 362532

OTAY MESA EAST - PROJECT NO. 108628

ADOPTED BY RESOLUTION NO. R-306960 ON JUL 26 2011

GENERAL:

1. This Vesting Tentative Map will be effective upon adoption of Rezone No. 388241.

2. This Vesting Tentative Map will expire three years after its approval or conditional approval, which will be JUL 26 2014.

3. Compliance with all of the following conditions shall be completed and/or assured, to the satisfaction of the City Engineer, prior to the recordation of the Final Map, unless otherwise noted.

4. Prior to the recordation of the Final Map, taxes must be paid on this property pursuant to Subdivision Map Act section 66492. To satisfy this condition, a tax certificate stating that there are no unpaid lien conditions against the subdivision must be recorded in the Office of the San Diego County Recorder.

5. The Final Map shall conform to the provisions of Site Development Permit No. 388242.

6. The Subdivider shall defend, indemnify, and hold the City (including its agents, officers, and employees [together, "Indemnified Parties"]) harmless from any claim, action, or proceeding, against the City and/or any Indemnified Parties to attack, set aside, void, or annul City's approval of this project, which action is brought within the time period provided for in Government Code section 66499.37. City shall promptly notify Subdivider of any claim, action, or proceeding and shall cooperate fully in the defense. If City fails to promptly notify Subdivider of any claim, action, or proceeding, or if City fails to cooperate fully in the defense, Subdivider shall not thereafter be responsible to defend, indemnify, or hold City and/or any Indemnified Parties harmless. City may participate in the defense of any claim, action, or proceeding if City both bears its own attorney's fees and costs, City defends the action in good faith, and Subdivider is not required to pay or perform any settlement unless such settlement is approved by the Subdivider.

ENGINEERING:

7. At the time of the final map, the Subdivider shall grant a building restrictive easement over Lot B.

8. Prior to the issuance of any construction permit, the Subdivider shall incorporate any construction Best Management Practices necessary to comply with Chapter 14, Article 2, Division 1 (Grading Regulations) of the San Diego Municipal Code, into the construction plans or specifications.

COPY

RESOLUTION NUMBER R- 306960

DATE OF FINAL PASSAGE JUL 26 2011

A RESOLUTION APPROVING VESTING TENTATIVE MAP NO. 362532 FOR OTAY MESA EAST - PROJECT NO. 108628

WHEREAS, Gerald Handler, Trustee of the Handler Trust UDT, Subdivider, and RBF Consulting, Engineer, submitted an application to the City of San Diego for a Vesting Tentative Map, No. 362532, for the subdivision of a vacant approximately 21.35-acre site into commercial and open space lots, known as the Otay Mesa East Project (Project); and

WHEREAS, on September 16, 2003, the City Council of the City of San Diego approved an earlier version of the Otay Mesa East Project, Project No. 3159, for a commercial subdivision on a 45.5-acre site, including specifically Vesting Tentative Map No. 8182 (Original VTM); and

WHEREAS, on August 26, 2009, the California Department of Transportation (Caltrans) acquired approximately 24.1-acres of the 45.5-acre site through condemnation for the realignment of State Route 905 (SR 905); and

WHEREAS, the project site is located in the 6100 block of Otay Mesa Road (temporarily addressed as 6175 Otay Mesa Road) west of Heritage Road in the AR-1-1 zone, which is proposed to be rezoned to the Otay Mesa Development District-Commercial (OMDD-C) zone, within the Otay Mesa Community Plan (Rezone); and

WHEREAS, the property is legally described as Parcel A, portion of the Northeast Quarter of the Northwest Quarter of Section 32, Township 18 South, Range 1 west, San Bernardino and Meridian, in the County of San Diego, State of California, according to the Official Plan thereof, excepting therefrom the Northerly 40.00 feet ("Otay Mesa Road") as described in that certain deed to the City of San Diego, a Municipal Corporation, filed in the Office of the County Recorder of said County, May 27, 1983, as File No. 83-177720 of Official

Records, and all that portion thereof taken by the State of California in that certain Final Order of Condemnation issued out of Superior Court Case No. 37-2008-0008061-CU-EI-CTL, a Certified Copy of which was recorded November 9, 2009, as File No. 2009-0624504, Official Records; Parcel B, portion of the Northeast Quarter of the Northwest Quarter of Section 32, Township 18 South, Range 1 West, San Bernardino and Meridian, in the County of San Diego, State of California, according to the Official Plan thereof, excepting therefrom the northerly 40.00 feet ("Otay Mesa Road") as described in that certain deed to the City of San Diego, A Municipal Corporation, filed in the Office of the County Recorder of said County, May 27, 1983, as File No. 83-177720 of Official Records, all that portion thereof taken by the State of California in that certain Final Order of Condemnation issued out of Superior Court Case No. 37-2008-0008061-CU-EI-CTL, a certified copy of which was recorded November 9, 2009, as File No. 2009-0624504, Official Records, and all that portion thereof described, deeded to the State of California, recorded on February 2, 2010, as File No. 2010-00054943, Official Record; and

WHEREAS, the Vesting Tentative Map proposes the subdivision of a 21.35-acre site into 8 lots for commercial use and open space (5 commercial lots, one open space lot, one lot for a private underground sewer pump station, and one lot for a private driveway); and

WHEREAS, on July 21, 2006, the Owner/Permittee filed an application for an Extension of Time (EOT) for the Original VTM prior to its expiration. However, the application for the EOT was never heard by the City Council and in accordance with San Diego Municipal Code Section 125.0461 and Subdivision Map Act Section 66452.6(e), the Original VTM could not be extended beyond September 2012 and because Subdivider desires a VTM that extends beyond September 2012, a new VTM is required for the Project; and

WHEREAS, on April 7, 2011, the Planning Commission of the City of San Diego considered Vesting Tentative Map No. 388242, and pursuant to Resolution No. 4689-PC voted to recommend City Council approval of a Vesting Tentative Map for a three-year period for the Project with the understanding that the appropriate vehicle to accomplish that recommendation would be determined prior to the Project coming before the City Council; and

WHEREAS, the project complies with the requirements of a preliminary soils and/or geological reconnaissance report pursuant to Subdivision Map Act and Sections 66490 and 66491 (b)-(f) and San Diego Municipal Code Section 144.0220; and

WHEREAS, under Charter section 280(a)(2) this resolution is not subject to veto by the Mayor because this matter requires the City Council to act as a quasi-judicial body and where a public hearing was required by law implicating due process rights of individuals affected by the decision and where the Council was required by law to consider evidence at the hearing and to make legal findings based on the evidence presented; and

WHEREAS, on ____________________, the City Council of the City of San Diego considered Vesting Tentative Map No. 362532, and pursuant to Section 125.0440 of the Municipal Code of the City of San Diego and Subdivision Map Act Section 66428, received for its consideration written and oral presentations, evidence having been submitted, and heard testimony from all interested parties at the public hearing, and the City Council having fully considered the matter and being fully advised concerning the same; NOW THEREFORE,

BE IT RESOLVED by the City Council of the City of San Diego, that it adopts the following findings with respect to Vesting Tentative Map No. 362532:

1. The proposed subdivision and its design or improvement are consistent with the policies, goals, and objectives of the applicable land use plan (Land Development Code Section 125.0440(a) and Subdivision Map Action Sections 66473.5, 66474(a), and 66474(b)). The proposed subdivision would provide eight (8) lots for commercial use and open space (5 commercial lots, one open space lot, one lot for a private underground sewer pump station, and one lot for a private driveway) along Otay Mesa Road for future development and an approximately 7.4-acre non-buildable portion of the site is located south of SR 905, a portion of which is required to be placed in a covenant of easement for protection of the 22 vernal pools and the area within the Multiple Habitat Planning Area (MHPA). The 21.35-acre vacant site is located in the 6100 block of Otay Mesa Road (temporarily addressed as 6175 Otay Mesa Road) west of Heritage Road.

The proposed subdivision is zoned AR-1-1 within the Otay Mesa Development District (OMDD) and the Otay Mesa Community Plan (OMCP). The site is designated for Specialized Commercial uses within the OMCP, which defers development requirements to the standards and provisions of the OMDD. The proposed commercial subdivision on a 21.35-acre vacant site includes a rezone from AR-1-1 to OMDD-C (Rezone). The proposed subdivision to create commercial lots for future development is not requesting and does not require any deviations to the OMDD development regulations. The proposed subdivision would establish 5 commercial lots for future development and construct the infrastructure needed for the development. The future development on the individual lots would comply with the OMDD development regulations. With the adoption of the Rezone, the proposed subdivision and its design and improvements are consistent with the policies, goals, and objectives of the OMDD, OMCP, and the General Plan.

2. **The proposed subdivision complies with the applicable zoning and development regulations of the Land Development Code (Land Development Code Section 125.0440(b)).** The proposed subdivision would provide eight (8) lots for commercial use and open space (5 commercial lots, one open space lot, one lot for a private underground sewer pump station, and one lot for a private driveway) along Otay Mesa Road for future development and an approximately 7.4-acre non-buildable portion of the site located south of the SR 905, a portion of which is required to be placed in a covenant of easement for protection of the 22 vernal pools and the area within the MHPA. The proposed commercial subdivision on a 21.35-acre vacant site includes a rezone from AR-1-1 to OMDD-C. The proposed subdivision is not requesting and does not require any deviations to the development regulations in the Land Development Code. With the adoption of the Rezone, which is a condition of the VTM, the proposed commercial lots would comply with the applicable zoning and development regulations of the Land Development Code, and the OMDD.

3. **The site is physically suitable for the type and density of development (Land Development Code Section 125.0440(c) and Subdivision Map Act Sections 66474(c) and 66474(d)).** The 21.35-acre vacant site has been historically used for agricultural purposes but is currently dominated by non-native grass species. Approximately 13.95-acres of the site along Otay Mesa Road currently contains a grade differential of 15 feet and slopes gently from a 520 foot above mean sea level (AMSL) from the western property line towards the east to a 505 foot AMSL at the eastern property line. The surrounding properties to the north consist of multi-family residential development, commercial/office/retail development, and open space; to the west is a proposed multi-family residential development; to the east is open space; and to the south is the realignment of SR 905, which is currently under construction.

An approximately 7.4-acre non-buildable portion of the site is located south of SR 905, a portion of which is required be placed in a covenant of easement for protection of the 22 vernal pools and the area within the MHPA. A building restrictive easement is also required to be recorded over this lot since the condemnation for the realignment of SR 905 eliminated access to this lot. The Mitigation Monitoring and Reporting Program (MMRP) for the project, which is required to be implemented as a condition of the VTM includes protocols and measures for protection of the onsite biological resources and a vernal pool management plan. Therefore, the site is physically suitable for the type and density of development.

4. **The design of the subdivision or the proposed improvements is not likely to cause substantial environmental damage or substantially and avoidably injure fish or wildlife or their habitat (Land Development Code Section 125.0440(d) and Subdivision Map Act Section 66474(e)).** The MMRP for the Project includes protocols and measures for protection of the onsite biological resources and a vernal pool management plan. An approximately 7.4-acre non-buildable portion of the site is located south of SR 905, a portion of which is required be placed in a covenant of easement for protection of the 22 vernal pools and the area within the MHPA. A building restrictive easement is also required to be recorded over this lot since the condemnation for the realignment of SR 905 eliminated access to this lot. Therefore, the design of the subdivision or the proposed improvements is not likely to cause substantial environmental damage or substantially and avoidably injure fish or wildlife or their habitat.

5. **The design of the subdivision or the type of improvements will not be detrimental to the public health, safety, and welfare (Land Development Code Section 125.0440(e) and Subdivison Map Act Section 66474(f)).** With the adoption of the rezone, the proposed subdivision and its design and improvements are consistent with the policies, goals, and objectives of the OMDD, Otay Mesa Community Plan, the San Diego Municipal Code (SDMC), the General Plan, and consistent with the Subdivision Map Act. Project and permit conditions have been determined by the decision-maker as necessary to avoid adverse impacts upon the health, safety, and general welfare of persons residing, working and recreating in the surrounding area. The future development on the proposed subdivision will be required to comply with the development regulations of the OMDD and will be required to obtain building permits to show that project construction will comply with all applicable Building and Fire Code requirements. Therefore, the proposed commercial subdivision will not be detrimental to the public health, safety and welfare.

6. **The design of the subdivision or the type of improvements will not conflict with easements acquired by the public at large for access through or use of property within the proposed subdivision (Land Development Code Section 125.0440(f) and Subdivision Map Act Section 66474(g)).** The design of the proposed commercial subdivision provides for two new public access roads from Otay Mesa Road, and provides for one private road through the project that connects to the two access roads and provides access for the five proposed commercial lots. On August 26, 2009, approximately 24.1-acres of the original 45.5-acres site were acquired by the California Department of Transportation (Caltrans) through condemnation for the realignment of SR 905; and no action is proposed for that area. Therefore, the design of the subdivision or the type of improvements will not conflict with easements acquired by the public at large for access through or use of property within the proposed subdivision.

7. **The design of the proposed subdivision provides, to the extent feasible, for future passive or natural heating and cooling opportunities (Land Development Code Section 125.0440(g) and Subdivision Map Act Section 66473.1).** The proposed subdivision would establish 5 commercial lots for future development and construct the infrastructure needed for the development. The future development on the individual lots would comply with the

OMDD development regulations. The proposed subdivision has been designed along the east-west axis, to the extent feasible, thereby increasing the area for future passive or natural heating and cooling opportunities.

8. **The decision maker has considered the effects of the proposed subdivision on the housing needs of the region and that those needs are balanced against the needs for public services and the available fiscal and environmental resources (Land Development Code Section 125.0440(h) and Subdivision Map Act Section 66412.3).** The vacant site has been historically used for agricultural purposes but is currently dominated by non-native grass species. The surrounding properties to the north contains multi-family residential development, commercial/office/retail development, and open space; to the west is a proposed multi-family residential development; to the east is open space; and to the south is the realignment of SR 905, which is currently under construction. The proposed commercial subdivision would allow for future commercial development and job opportunities for the current and future multi-family households within the region. Therefore, the decision maker has considered the effects of the proposed subdivision on the housing needs of the region and that those needs are balanced against the needs for public services and the available fiscal and environmental resources.

The above findings are supported by the minutes, maps, and exhibits, all of which are herein incorporated by reference.

BE IT FURTHER RESOLVED, that based on the Findings hereinbefore adopted by the City Council, Vesting Tentative Map No. 362532, is hereby granted to Gerald Handler, Trustee of the Handler Trust UDT, subject to the attached conditions which are made a part of this resolution by this reference.

APPROVED: JAN I. GOLDSMITH, City Attorney

By ______________________
Heidi K. Vonblum
Deputy City Attorney

HKV:hm
07/07/2011
Or.Dept:DSD

Doc. No. 208252

COPY

9. Prior to the issuance of any construction permit, the Subdivider shall incorporate and show the type and location of all post-construction Best Management Practices (BMP's) on the final construction drawings, in accordance with the approved Water Quality Technical Report.

10. The Subdivider shall enter into a Maintenance Agreement for the ongoing permanent BMP maintenance, satisfactory to the City Engineer.

11. The drainage system proposed for this subdivision, as shown on the approved Vesting Tentative Map, is private and subject to approval by the City Engineer, and shall include detention basins and flood water storage easements satisfactory to the City Engineer.

12. Development of this project shall comply with all requirements of the applicable State Water Resources Control Board (SWRCB) Order and the Municipal Storm Water Permit, governing Waste Discharge Requirements for Discharges of Storm Water Runoff Associated With Construction Activity. In accordance with said permit, a Storm Water Pollution Prevention Plan (SWPPP) and a Monitoring Program Plan shall be implemented concurrently with the commencement of grading activities, and a Notice of Intent (NOI) shall be filed with the SWRCB.

13. A copy of the acknowledgment from the SWRCB that an NOI has been received for this project shall be filed with the City of San Diego when received; further, a copy of the completed NOI from the SWRCB showing the permit number for this project shall be filed with the City of San Diego when received. In addition, Subdivider and Subdivider's successor(s) shall comply with special provisions as set forth in the applicable SWRCB Order.

14. The Subdivider shall obtain a bonded grading permit from the City Engineer for the grading proposed for this project. All grading shall conform to the requirements of the City of San Diego Municipal Code in a manner satisfactory to the City Engineer.

15. The applicant shall construct drainage detention basins, the design, location, and size of which are subject to approval by the City Engineer. The design shall be such that the discharge from the improved area will be no more than the discharge would have been from the land in the unimproved state. The applicant shall provide for the maintenance of the drainage detention facilities within a storage easement, satisfactory to the City Engineer.

16. The Subdivider shall underground any new service run to any new or proposed structures within the subdivision.

17. The Subdivider shall ensure that all existing onsite utilities serving the subdivision shall be undergrounded with the appropriate permits. The Subdivider shall provide written confirmation from applicable utilities that the conversion has taken place, or provide other means to assure the undergrounding, satisfactory to the City Engineer.

18. Conformance with the "General Conditions for Tentative Subdivision Maps," filed in the Office of the City Clerk under Document No. 767688 on May 7, 1980, is required. Only those exceptions to the General Conditions which are shown on the Vesting Tentative Map and covered in these special conditions will be authorized. All public improvements and incidental facilities shall be designed in accordance with criteria established in the Street Design Manual, filed with the City Clerk as Document No. RR-297376.

MAPPING:

19. "Basis of Bearings" means the source of uniform orientation of all measured bearings shown on the map. Unless otherwise approved, this source shall be the California Coordinate System, Zone 6, North American Datum of 1983 [NAD 83].

20. "California Coordinate System" means the coordinate system as defined in Section 8801 through 8819 of the California Public Resources Code. The specified zone for San Diego County is "Zone 6," and the official datum is the "North American Datum of 1983."

21. The Final Map shall:

    a. Use the California Coordinate System for its "Basis of Bearing" and express all measured and calculated bearing values in terms of said system. The angle of grid divergence from a true median (theta or mapping angle) and the north point of said map shall appear on each sheet thereof. Establishment of said Basis of Bearings may be by use of existing Horizontal Control stations or astronomic observations.

    b. Show two measured ties from the boundary of the map to existing Horizontal Control stations having California Coordinate values of Third Order accuracy or better. These tie lines to the existing control shall be shown in relation to the California Coordinate System (i.e., grid bearings and grid distances). All other distances shown on the map are to be shown as ground distances. A combined factor for conversion of grid-to-ground distances shall be shown on the map.

WASTEWATER:

22. The Subdivider shall construct the Otay Mesa Trunk Sewer Phase II or enter into an agreement to pay their fair share cost of the trunk sewer in proportion to the ultimate zoned use of the property being developed, in accordance with the City's Sewer Design Guide.

23. The Subdivider shall install all sewer facilities required by the accepted sewer study for the project, necessary to serve this development. Sewer facilities as shown on the approved vesting tentative map will require modification based on the accepted sewer study.

24. The Subdivider shall design and construct all proposed public sewer facilities to the most current edition of the City of San Diego's sewer design guide. Proposed facilities that do not meet the current standards shall be re-designed.

25. The Subdivider shall design and construct all proposed private sewer facilities serving more than one lot to the most current edition of the City of San Diego's sewer design guide. Improvement drawings are required for private sewer facilities serving more than one lot.

26. Prior to the issuance of any building permits, the Subdivider shall process and record a Notice & Agreement for each ownership being served by a private pump station/sewer facilities which serves more than one ownership, which indemnifies the City and contains an agreement that the applicant, and successors in interest, will be responsible for the operation and maintenance of the private sewer systems.

27. The Subdivider shall obtain a building permit for any private pump station serving a condominium project or more than one lot.

28. The Subdivider shall provide, satisfactory to the Public Utilities Department Director, CC&R's for the operation and maintenance of on-site private sewer facilities that serve more than one lot.

29. No structures or landscaping, including private sewer facilities and enhanced paving, shall be installed in or over any easement or street right-of-way prior to the Subdivider obtaining an Encroachment Maintenance and Removal Agreement.

30. Providing sewer for this development is dependent upon prior construction of certain portions of the Otay Mesa Trunk Sewer Phase II. If they have not been constructed when required for this development, then the construction of certain portions of these sewer facilities, as required by the City Engineer, shall become off-site improvements required for this development.

WATER:

31. The Subdivider shall design and construct a system of public 16-inch water facilities within Street "B," Street "C," and Street "A," with two points of connection to the Otay Mesa Pipeline, in a manner satisfactory to the Public Utilities Department Director and the City Engineer.

32. The Subdivider shall install fire hydrants at locations satisfactory to the Public Utilities Department, the Fire Department and the City Engineer.

33. The Subdivider shall grant adequate water easements, including vehicular access to each appurtenance (meters, blow offs, valves, fire hydrants, etc.), over the entire Street A, satisfactory to the Public Utilities Department Director.

34. Grants of water easements shall be of sufficient width to accommodate a minimum 24-feet wide fully paved vehicular access road with full height curbs, and 4-feet behind curb or sidewalk. Easements shall accommodate two-way traffic. Easements or lack thereof, as shown on the approved tentative map, will require modification based on standards at final engineering.

35. The Subdivider shall design and construct all irrigations systems to utilize reclaimed water in a manner satisfactory to the Public Utilities Department Director.

36. The Subdivider shall design and construct all proposed public water facilities, including services, meters, and easements, in accordance with established criteria in the most current edition of the City of San Diego Water Facility Design Guidelines and City regulations, standards, and practices pertaining thereto. Water facilities, as shown on the approved tentative map, shall be modified at final engineering to comply with standards.

GEOLOGY:

37. Prior to the issuance of a grading permit, the Subdivider shall submit a geotechnical report prepared in accordance with the City of San Diego's "Guidelines for Geotechnical Reports," satisfactory to the City Engineer.

PLANNING:

38. Prior to the recordation of the Final Map, the Subdivider shall execute and record a Covenant of Easement which ensures preservation of the Environmentally Sensitive Lands that are outside the allowable development area on the premises as shown on Exhibit "A" for Sensitive Biological Resources, in accordance with San Diego Municipal Code section 143.0152. The Covenant of Easement shall include a legal description and an illustration of the premises showing the development area and the Environmentally Sensitive Lands that will be preserved as shown on Exhibit "A."

LANDSCAPE:

39. The Final Map shall conform to the Landscape provisions of Site Development Permit No. 388242.

TRANSPORTATION:

40. Prior to the recordation of first final map, Subdivider shall relinquish access rights along project frontage on Otay Mesa Road, satisfactory to the City Engineer.

41. Street B is classified as a commercial local street. The Subdivider shall dedicate 84 feet of right-of-way and shall construct 64 feet of pavement, curb gutter and a five (5)-foot-wide sidewalk. The Subdivider shall also dedicate 92 feet of right-of way for a portion of Street B and shall construct, within 200 feet of the intersection with Otay Mesa Road, 72 feet of pavement (an 18-foot southbound lane, a four (4)-foot raised center median, two (2) 12-foot northbound left turn lanes, a 12-foot northbound through lane, a 14-foot northbound through lane and a 14-foot northbound right turn lane, with curb, gutter and a five (5)-foot-wide sidewalk transitioning to the aforementioned 84-foot right-of-way. Finally, the Subdivider shall construct, at the southern terminus of Street B, a 55-foot curb radius cul-de-sac within 65 feet of right-of-way, including curb, gutter and a five (5) -foot sidewalk.

42. Street C is classified as a commercial local street. The Subdivider shall dedicate 40 feet of right-of-way along with right-of-way for a 65-foot right-of-way radius for a cul-de-sac, and shall construct the half width of Street "C" including 30 feet of pavement, curb, gutter and a five (5)-foot sidewalk within 10-foot curb to property line distance with 55-foot curb radius cul-de-sac turnaround at the southern end, satisfactory to the City Engineer.

43. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of Street "B" with 64 feet curb to curb within 84 feet right-of-way including curb, gutter and 5-foot sidewalk within 10-foot curb to property line distance on both sides of the street with 55-foot curb radius cul-de-sac turnaround at the southern end, satisfactory to the city Engineer.

44. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of Street "B" within 200 feet of its intersection with Otay Mesa Road with 72 feet of curb to curb pavement (18' southbound lane, 4' raised center median, two12' northbound left turn lanes, 12' northbound thru lane, 14' northbound right turn lane) within 92 feet of right- of-way including curb, gutter and 5-foot sidewalk within 10-foot curb to property line distance on both sides of the street transitioning to a 64 feet curb to curb width within 84 feet right-of-way with 55-foot curb radius cul-de-sac turnaround at the southern end within 65 feet right-of-way, satisfactory to the City Engineer.

45. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of a second left turn lane on Otay Mesa Road at its intersection with Street "B", satisfactory to the City Engineer.

46. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of a eastbound exclusive right turn lane with 500 feet of storage and proper transition on Otay Mesa Road at its intersection with Street "B", satisfactory to the City Engineer.

47. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, modification of the existing traffic signal at the intersection of Otay Mesa Road / Street "B" in order to accommodate the improvements by this project at this intersection, satisfactory to the City Engineer.

48. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of private Street "A" between Street "B" and Street "C" with 50 feet of pavement within 70 feet of private general utility easement with curb, gutter and 5-foot sidewalk on both sides of the street and raised center median at both ends of the streets within 200 feet of intersection with Street "B" and Street "C", satisfactory to the City Engineer.

49. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of half width of Street "C" including 30 feet of pavement, curb, gutter and 5-foot sidewalk within 10-foot curb to property line distance with 55-foot curb radius cul-de-sac turnaround at the southern end, satisfactory to the City Engineer.

COPY

50. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond construction of a eastbound exclusive right turn lane with 200 feet of storage and proper transition on Otay Mesa Road at its intersection with Street "C", satisfactory to the City Engineer.

Does this still apply? Not on plans

51. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of second eastbound left turn lane and one exclusive westbound right turn lane at the intersection of Otay Mesa Road / Ocean View Hills Parkway, satisfactory to the City Engineer.

"

52. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of second westbound left turn lane at the intersection of Otay Mesa Road / Ocean View Hills Parkway, satisfactory to the City Engineer. Subdivider may enter into a deferred improvement agreement with City of San Diego for this improvement.

"

53. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of the second half (western half) of Street "C" to provide 60 feet of pavement, curb, gutter and 5-foot sidewalk within 10-foot curb to property line distance on the west side, satisfactory to the City Engineer. Subdivider may enter into a deferred improvement agreement with City of San Diego for this improvement.

Does this apply?

54. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of a westbound left turn lane at the intersection of Otay Mesa Road / Street "C", satisfactory to the City Engineer. Subdivider may enter into a deferred improvement agreement with City of San Diego for this improvement.

55. Prior to the recordation of the first final map, Subdivider shall assure by permit and bond, construction of a traffic signal a the intersection of Otay Mesa Road / Street "C", satisfactory to the City Engineer. Subdivider may enter into a deferred improvement agreement with City of San Diego for this improvement.

where is this?

56. Prior to the recordation of the first final map, Subdivider shall provide an Irrevocable Offer of Dedication (IOD) for half of the cul-de-sac on Street A at the western end of Camino Maquiladora with 55-foot curb radius turn around within 60 feet of right-of-way, satisfactory to the City Engineer.

ENVIRONMENTAL:

57. The Subdivider shall comply with the Mitigation, Monitoring and Reporting Program (MMRP) as specified in Mitigated Negative Declaration No. 99-0555, Project No. 3159, to the satisfaction of the Development Services Department and the City Engineer. Prior to issuance of any grading permits and/or building permits, mitigation measures as specifically outlined in the MMRP shall be implemented for Land Use/Biological Resources/Historical Resources (Archaeology)/Water Quality.

MSCP:

58. In accordance with authorization granted to the City of San Diego from the United States Fish and Wildlife Service (USFWS) pursuant to Section 10(a) of the ESA and by the California Department of Fish and Game (CDFG) pursuant to Fish and Game Code section 2835 as part of the Multiple Species Conservation Program (MSCP), the City of San Diego through the issuance of this Permit hereby confers upon Subdivider the status of Third Party Beneficiary as provided for in Section 17 of the City of San Diego Implementing Agreement (IA), executed on July 17, 1997 and on File in the Office of the City Clerk as Document No. 00-18394. Third Party Beneficiary status is conferred upon Permittee by the City: (1) to grant Subdivider the legal standing and legal right to utilize the take authorizations granted to the City pursuant to the MSCP within the context of those limitations imposed under this Permit and the IA, and (2) to assure Subdivider that no existing mitigation obligation imposed by the City of San Diego pursuant to this Permit shall be altered in the future by the City of San Diego, USFWS or CDFG, except in the limited circumstances described in Sections 9.6 and 9.7 of the IA.

    If mitigation lands are identified but not yet dedicated or preserved in perpetuity, maintenance and continued recognition of Third Party Beneficiary status by the City is contingent upon Subdivider maintaining the biological values of any and all lands committed for mitigation pursuant to this Permit and of full satisfaction by Subdivider of mitigation obligations required by this Permit, as described in accordance with Section 17.1D of the IA.

59. The Subdivider shall comply with the Mitigation, Monitoring and Reporting Program (MMRP) as specified in the Environmental Documentation for the "Otay Mesa East Project" (Project No. 3159, SCH No. 2003051060), satisfactory to the City Manager and the City Engineer, for the following issues areas to ensure compliance with the MSCP and MHPA Land Use Adjacency Guidelines: Land Use, Biological Resources and Water Quality.

    In addition, the following conditions shall apply:

    Operational Noise: Prior to issuance of any building occupancy permits, the sewer pump station proposed adjacent to the existing Otay Mesa Road wildlife under crossing shall be constructed, to the satisfaction of the Development Services Department and the City Engineer, to ensure that operational noise does not impact wildlife movement, including: 1) designing the facility below-ground; 2) encasing it in concrete; 3) providing perimeter berms and native screening vegetation; and, 4) shielding/directing all necessary lighting away from the MHPA.

    Edge Treatment: Prior to issuance of any building occupancy permits, the Subdivider shall construct a six-foot-high black vinyl-coated chain link fence along areas adjacent to the MHPA, including the rear of proposed Lot B, satisfactory to the Development Services Department and the City Engineer. The fencing shall be appropriately maintained at all times by the Subdivider. Any necessary future fence repairs shall be conducted in a manner which does not result in impacts to sensitive biology resource or wildlife movement.

Drainage: Prior to recordation of the first final map and/or issuance of any grading permits, the Development Services Department and the City Engineer shall verify that on-site drainage for all lots, including proposed Lot B, is designed to avoid discharging into the on-site vernal pool watershed areas.

60. Prior to recordation of the first final map and/or issuance of any grading permits, the on-site MHPA shall be conserved and conveyed to the City's MHPA through either dedication in fee to the City, OR covenant of easement, which shall then be recorded on the property to the satisfaction of the City Attorney. All other areas of Lot B could be conveyed through any of the two above methods. Management of the on-site preserved MHPA shall be the responsibility of the Subdivider in perpetuity, unless the City accepts responsibility through dedication in fee title. *Note: Any proposed dedication of land in-fee to the City outside the MHPA would require approval from the Park and Recreation Department.

INFORMATION:

- The approval of this Vesting Tentative Map by the City Council of the City of San Diego does not authorize the subdivider to violate any Federal, State, or City laws, ordinances, regulations, or policies including but not limited to, the Federal Endangered Species Act of 1973 and any amendments thereto (16 USC § 1531 et seq.).

- If the Subdivider makes any request for new water and sewer facilities (including services, fire hydrants, and laterals), the Subdivider shall design and construct such facilities in accordance with established criteria in the most current editions of the City of San Diego water and sewer design guides and City regulations, standards and practices pertaining thereto. Off-site improvements may be required to provide adequate and acceptable levels of service and will be determined at final engineering.

- Subsequent applications related to this Vesting Tentative Map will be subject to fees and charges based on the rate and calculation method in effect at the time of payment.

- Any party on whom fees, dedications, reservations, or other exactions have been imposed as conditions of approval of the Vesting Tentative Map, may protest the imposition within ninety days of the approval of this Vesting Tentative Map by filing a written protest with the San Diego City Clerk pursuant to Government Code sections 66020 and/or 66021.

- Where in the course of development of private property, public facilities are damaged or removed, the Subdivider shall at no cost to the City, obtain the required permits for work in the public right-of-way, and repair or replace the public facility to the satisfaction of the City Engineer (San Diego Municipal Code § 142.0607.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

11	SD	NA	
DIST	CO	RTE	PM

COUNT DATE ____________
CALC JR ____ DATE ____________
CHK ____________ DATE ____________

Major St: OTAY MESA RD
Minor St: STREET B / EMERALD CREST

Critical Approach Speed ________ mph
Critical Approach Speed ________ mph

Speed limit or critical speed on major street traffic > 40 mph........................ ☒
or
In built up area of isolated community of < 10,000 population...................... ☐ } **RURAL (R)**
☐ **URBAN (U)**

OTAY MESA RD POSTED SPEED LIMIT = 50 MPH

(Based on Estimated Average Daily Traffic - See Note)

URBAN............ RURAL......✓ **CONDITION A - Minimum Vehicular Volume** Satisfied ______ Not Satisfied ✓	Minimum Requirements EADT			
	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach	Urban	Rural ✓	Urban	Rural ✓
Major Street 1........ / Minor Street 1........	8,000	5,600	2,400	1,680
Major Street 2 or More........ / Minor Street 1........	9,600	6,720	2,400	1,680
Major Street 2 or More..16,330.... / Minor Street 2 or More..1,704....	9,600	6,720 ✓	3,200	2,240 ✗
Major Street 1........ / Minor Street 2 or More........	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic Satisfied ✓ Not Satisfied ______	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach	Urban	Rural ✓	Urban	Rural ✓
Major Street 1........ / Minor Street 1........	12,000	8,400	1,200	850
Major Street 2 or More........ / Minor Street 1........	14,400	10,080	1,200	850
Major Street 2 or More..16,330.... / Minor Street 2 or More..1,704....	14,400	10,080 ✓	1,600	1,120 ✓
Major Street 1........ / Minor Street 2 or More........	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B Satisfied ______ Not Satisfied ______ No one condition satisfied, but following conditions fulfilled 80% or more.......... ____ A ____ B	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

STEET B HAS 50% EGRESS (MINOR ST APPROACH). TG = 6,816 ADT ÷ 2 = 3,408 OUTBOUND
X 50% = 1,704 MINOR ST DAILY APPROACH VOL.

Appendix K

City of San Diego Trip Generation Manual Excerpts

TABLE 1

May 2003

TRIP GENERATION RATE SUMMARY
(WEEKDAY)

LAND USE	DRIVEWAY (1) (2) VEHICLE TRIP RATE	CUMULATIVE (8) VEHICLE TRIP RATE	PEAK HOUR AND IN/OUT RATIO AM (IN:OUT)	PM IN:OUT)
AGRICULTURE (OPEN SPACE) (3)	2 trips/acre	2 trips/acre	- -	- -
AIRPORT (3)				
Commercial	100 trips/flight; 60 trips/acre	100 trips/flight; 60 trips/acre	6% (6:4)	7% (5:5)
General Aviation	2 trips/flight; 6 trips/acre	2 trips/flight; 6 trips/acre	- -	- -
CEMETERY	5 trips/acre	5 trips/acre	- -	- -
COMMERCIAL-RETAIL (4) (5)				
Automobile Services:				
Car Dealer	50 trips/1,000 sq. ft.; 300 trips/acre	45 trips/1,000 sq. ft.; 297 trips/acre	5% (7:3)	8% (4:6)
Carwash:				
Full service	900 trips/site; 600 trips/acre	450 trips/site; 300 trips/acre	4% (5:5)	9% (5:5)
Self service	100 trips/wash stall	50 trips/wash stall	4% (5:5)	8% (5:5)
Gasoline Stations:	130 trips/vehicle fueling space; 750 trips/station	26 trips/vehicle fueling space; 150 trips/station	7% (5:5)	11% (5:5)
With food mart	150 trips/vehicle fueling space	30 trips/vehicle fueling space	8% (5:5)	8% (5:5)
With fully automated carwash	135 trips/vehicle fueling space	27 trips/vehicle fueling space	- -	- -
With food mart & fully automated carwash	155 trips/vehicle fueling space	31 trips/vehicle fueling space	8% (5:5)	9% (5:5)
Parts Sale	62 trips/1,000 sq. ft.	56 trips/1,000 sq. ft.	4% (5:5)	10% (5:5)
Repair Shop	20 trips/1,000 sq. ft.; 20 trips/service stall; 400 trips acre	18 trips/1,000 sq. ft.; 19 trips/service stall	8% (7:3)	11% (4:6)
Tire Store	25 trips/1,000 sq. ft.; 30 trips/service stall	23 trips/1,000 sq. ft.; 27 trips/service stall	7% (6:4)	11% (5:5)
Convenience Market Chain:				
Open Up to 16 Hours Per Day	500 trips/1,000 sq. ft.	250 trips/1,000 sq. ft.	8% (5:5)	8% (5:5)
Open 24 Hours	700 trips/1,000 sq. ft.	350 trips/1,000 sq. ft.	9% (5:5)	7% (5:5)
Discount Store/Discount Club	70 trips/1,000 sq. ft.	49 trips/1,000 sq. ft.	2% (6:4)	10% (5:5)
Drugstore	90 trips/1,000 sq. ft.	40 trips/1,000 sq. ft.	4% (6:4)	10% (5:5)
Furniture Store	6 trips/1,000 sq. ft.; 100 trips/acre	5.4 trips/1,000 sq. ft.	4% (7:3)	9% (5:5)
Lumber/Home Improvement Store	30 trips/1,000 sq. ft.; 150 trips/acre	27 trips/1,000 sq. ft.; 135 trips/acre	7% (6:4)	9% (5:5)
Nursery	40 trips/1,000 sq. ft.; 90 trips/acre	36 trips/1,000 sq. ft.; 81 trips/acre	3% (6:4)	10% (5:5)
Restaurant:				
Quality	100 trips/1,000 sq. ft.; 3 trips/seat; 500 trips/acre	90 trips/1,000 sq. ft.; 2.7 trips/seat; 450 trips/acre	1% (6:4)	8% (7:3)
High Turnover (sit-down)	130 trips/1,000 sq. ft.; 7 trips/seat; 1,200 trips/acre	104 trips/1,000 sq. ft.; 5.6 trips/seat; 460 trips/acre	8% (5:5)	8% (6:4)
Fast Food (with or without drive-through)	700 trips/1,000 sq. ft.; 22 trips/seat; 3,000 trips/acre	420 trips/1,000 sq. ft.; 13.2 trips/seat; 1,800 trips/acre	4% (6:4)	8% (5:5)
Shopping Center:				
Neighborhood (30,000 sq. ft. or more GLA on 4 or more acres)	120 trips/1,000 sq. ft. GLA; 1,200 trips/acre	72 trips/1,000 sq. ft.; 720 trips/acre	4% (6:4)	11% (5:5)
Community (100,000 sq. ft. or more GLA on 10 or more acres)	70 trips/1,000 sq. ft. GLA; 700 trips/acre	49 trips/1,000 sq. ft.; 490 trips/acre	3% (6:4)	10% (5:5)
Regional (300,000 sq. ft. or more GLA) (6)	$\ln(T) = 0.756 \ln(x) + 5.25$ *	$0.8 [\ln(T) = 0.756 \ln(x) + 5.25]$ *	2% (7:3)	9% (5:5)
Specialty Retail Center/Strip Commercial	40 trips/1,000 sq. ft.; 400 trips/acre	36 trips/1,000 sq. ft.; 360 trips/acre	3% (6:4)	9% (5:5)
Supermarket	150 trips/1,000 sq. ft.; 2,000 trips/acre	90 trips/1,000 sq. ft.; 2,000 trips/acre	4% (7:3)	10% (5:5)

* See Table 2

TABLE 1 (Continued)

TRIP GENERATION RATE SUMMARY
(WEEKDAY)

LAND USE	DRIVEWAY [1][2] VEHICLE TRIP RATE	CUMULATIVE [8] VEHICLE TRIP RATE	PEAK HOUR AND IN/OUT RATIO AM (IN:OUT)	PM (IN:OUT)
EDUCATION [3]				
University (4 years or higher)	2.5 trips/student; 100 trips/acre	2.5 trips/student; 100 trips/acre	10% (9:1)	9% (3:7)
Community College (2 years)	1.6 trips/student; 18 trips/1,000 sq. ft.; 80 trips/acre	1.6 trips/student; 18 trips/1,000 sq. ft.; 80 trips/acre	12% (9:1)	8% (3:7)
High School	1.8 trips/student; 50 trips/acre; 11 trips/1,000 sq. ft.	1.8 trips/student; 50 trips/acre; 11 trips/1,000 sq. ft.	20% (8:2)	14% (3:7)
Junior High/Middle School	1.4 trip/student; 12 trips/1,000 sq. ft.; 40 trips/acre	1.4 trips/student; 12 trips/1,000 sq. ft.; 40 trips/acre	24% (7:3)	7% (3:7)
Elementary School	2.9 trips/student; 39 trips/1,000 sq. ft.; 136 trips/acre	2.9 trips/student; 39 trips/1,000 sq ft.; 136 trips/acre	31% (6:4)	19% (4:6)
Day Care Center	5 trips/child; 80 trips/1,000 sq. ft.	5 trips/child; 80 trips/1,000 sq. ft.	19% (5:5)	18% (5:5)
FINANCIAL INSTITUTION (Bank or Credit Union) [5]				
Excluding drive-through	150 trips/1,000 sq. ft.; 1,000 trips/acre	112.5 trips/1,000 sq. ft.; 750 trips/acre	4% (7:3)	8% (4:6)
With drive-through	200 trips/1,000 sq. ft.; 1,500 trips/acre	150 trips/1,000 sq. ft.; 1,125 trips/acre	5% (6:4)	10% (5:5)
Drive-through only	250 trips/lane	187.5 trips/lane	3% (5:5)	13% (5:5)
HOSPITAL [3]				
Convalescent/Nursing	3 trips/bed	3 trips/bed	7% (6:4)	7% (4:6)
General	20 trips/bed; 20 trips/1,000 sq. ft.; 300 trips/acre	20 trips/bed; 20 trips/1,000 sq. ft.; 300 trips/acre	9% (7:3)	10% (3:7)
HOUSE OF WORSHIP [4]				
General	15 trips/1,000 sq. ft.; quadruple rates for days of	9 trips/1,000 sq. ft.; quadruple rate for days of	4% (8:2)	8% (5:5)
Without School or Day Care	5 trips/1,000 sq. ft.; quadruple rates for days of assembly	5 trips/1,000 sq. ft.; quadruple rate for days of	4% (8:2)	8% (5:5)
INDUSTRIAL				
Industrial/Business Park (some commercial included) [3]	16 trips/1,000 sq. ft.; 200 trips/acre	16 trips/1,000 sq. ft.; 200 trips/acre	12% (8:2)	12% (2:8)
Small Industrial Park [7] *	15 trips/1,000 sq. ft.; 120 trips/acre	15 trips/1,000 sq. ft.; 120 trips/acre	11% (9:1)	12% (2:8)
Large Industrial Park *	8 trips/1,000 sq. ft.; 100 trips/acre	8 trips/1,000 sq. ft.; 100 trips/acre	11% (9:1)	12% (2:8)
Manufacturing/Assembly	4 trips/1,000 sq. ft.; 50 trips/acre	4 trips/1,000 sq. ft.; 50 trips/acre	20% (9:1)	20% (2:8)
Rental Storage	2 trips/1,000 sq. ft.; 30 trips/acre	2 trips/1,000 sq. ft.; 30 trips/acre	6% (5:5)	9% (5:5)
Scientific Research and Development	8 trips/1,000 sq. ft.; 80 trips/acre	8 trips/1,000 sq. ft.; 80 trips/acre	16% (9:1)	14% (1:9)
Truck Terminal	10 trips/1,000 sq. ft.; 7 trips/bay; 80 trips/acre	10 trips/1,000 sq. ft.; 7 trips/bay; 80 trips/acre	9% (4:6)	8% (5:5)
Warehousing	5 trips/1,000 sq. ft.; 60 trips/acre	5 trips/1,000 sq. ft.; 60 trips/acre	15% (7:3)	16% (4:6)
LIBRARY [3]	50 trips/1,000 sq. ft.; 400 trips/acre		2% (7:3)	10% (5:5)
Less than 100,000 sq. ft.		20 trips/1,000 sq. ft.	2% (7:3)	10% (5:5)
100,000 sq. ft. or more		16 trips/1,000 sq. ft.	2% (7:3)	10% (5:5)

* Small amount of local serving commercial included. May have multiple shifts.

TABLE 1 (Continued)

TRIP GENERATION RATE SUMMARY
(WEEKDAY)

LAND USE	DRIVEWAY (1) (2) VEHICLE TRIP RATE	CUMULATIVE (8) VEHICLE TRIP RATE	PEAK HOUR AND IN/OUT RATIO AM (IN:OUT)	PM (IN:OUT)
LODGING (3)				
Hotel (w/convention facilities/restaurant)	10 trips/room; 300 trips/acre	10 trips/room; 300 trips/acre	6% (6:4)	8% (6:4)
Motel	9 trips/room; 200 trips/acre	9 trips/room; 200 trips/acre	8% (4:6)	9% (4:6)
Resort Hotel	8 trips/room; 100 trips/acre	8 trips/room; 100 trips/acre	5% (6:4)	7% (6:4)
MILITARY BASE (3)	2.5 trips/employee (military or civilian)	2.5 trips/employee (military or civilian)	9% (9:1)	10% (6:4)
OFFICE				
Commercial Office (6)	$Ln(T) = 0.756 Ln(x) + 3.95$; 450 trips/acre	$Ln(T) = 0.756 Ln(x) + 3.95$; 450 trips/acre	13% (9:1)	14% (2:8)
Corporate Headquarters/Single Tenant Office	10 trips/1,000 sq. ft.	10 trips/1,000 sq. ft.	15% (9:1)	15% (1:9)
Department of Motor Vehicles	180 trips/1,000 sq. ft.; 900 trips/acre	18 trips/1,000 sq. ft.	6% (6:4)	11% (4:6)
Government Office (Civic Center):	30 trips/1,000 sq. ft.		9% (9:1)	12% (3:7)
Less than 100,000 sq. ft.		20 trips/1,000 sq. ft.	9% (9:1)	12% (3:7)
100,000 sq. ft. or more		16 trips/1,000 sq. ft.	9% (9:1)	12% (3:7)
Medical Office:	50 trips/1,000 sq. ft.; 500 trips/acre		6% (8:2)	10% (3:7)
Less than 100,000 sq. ft.		20 trips/1,000 sq. ft.	6% (8:2)	10% (3:7)
100,000 sq. ft. or more		16 trips/1,000 sq. ft.	6% (8:2)	10% (3:7)
Post Office:				
Distribution (central/walk-in only)	90 trips/1,000 sq. ft.	76 trips/1,000 sq. ft.	5%	7%
Community (without mail drop lane)	200 trips/1,000 sq. ft.; 1,300 trips/acre	168 trips/1,000 sq. ft.; 1,092 trips/acre	6% (6:4)	9% (5.5)
Community (with mail drop lane)	300 trips/1,000 sq. ft.; 2,000 trips/acre		7% (5:5)	9% (3.7)
Less than 100,000 sq. ft.		168 trips/1,000 sq. ft.; 1,092 trips/acre	7% (5:5)	7% (6:4)
100,000 sq. ft. or more		252 trips/1,000 sq. ft.; 1,680 trips/acre	7% (5:5)	8% (7:3)
RECREATION				
Bowling Center	30 trips/lane; 300 trips/acre	30 trips/lane; 300 trips/acre	7% (7:3)	10% (4:6)
Golf Course	600 trips/course; 40 trips/hole; 8 trips/acre	600 trips/course; 40 trips/hole; 8 trips/acre	6% (8:2)	9% (3:7)
Marina	4 trips/berth; 20 trips/acre	4 trips/berth; 20 trips/acre	3% (3:7)	7% (6:4)
Movie Theater	80 trips/1,000 sq. ft.; 1.8 trips/seat	80 trips/1,000 sq. ft.; 1.8 trips/seat	0.3%	8% (7:3)
Park:				
Beach, Ocean or Bay	600 trips/1,000 ft. shoreline; 60 trips/acre	600 trips/1,000 ft. shoreline; 60 trips/acre	- -	11% (4:6)
Developed	50 trips/acre	50 trips/acre	4%	8%
Undeveloped	5 trips/acre	5 trips/acre	4%	8%
Racquetball/Tennis/Health Club	40 trips/1,000 sq. ft.; 40 trips/court; 300 trips/acre	40 trips/1,000 sq. ft.; 40 trips/court; 300 trips/acre	4% (6:4)	9% (6:4)
San Diego Zoo	115 trips/acre	115 trips/acre	- -	- -
Sea World	80 trips/acre	80 trips/acre	- -	- -
Sport Facility:				
Indoor	30 trips/acre	30 trips/acre	- -	- -
Outdoor	50 trips/acre	50 trips/acre	- -	- -

TABLE 1 (Continued)

TRIP GENERATION RATE SUMMARY
(WEEKDAY)

LAND USE	DRIVEWAY [1] [2] VEHICLE TRIP RATE	CUMULATIVE [8] VEHICLE TRIP RATE	PEAK HOUR AND IN/OUT RATIO AM (IN:OUT)	PM (IN:OUT)
RESIDENTIAL [3]				
Congregate Care Facility	2 trips/dwelling unit	2 trips/dwelling unit	3% (6:4)	8% (5:5)
Estate Housing	12 trips/dwelling unit	12 trips/dwelling unit	- -	- -
Mobile Home	5 trips/dwelling unit; 40 trips/acre	5 trips/dwelling unit; 40 trips/acre	9% (3:7)	12% (6:4)
Multiple Dwelling Unit:				
Under 20 dwelling units/acre	8 trips/dwelling unit	8 trips/dwelling unit	8% (2:8)	10% (7:3)
Over 20 dwelling units/acre	6 trips/dwelling unit	6 trips/dwelling unit	8% (2:8)	9% (7:3)
Retirement/Senior Citizen Housing	4 trips/dwelling unit	4 trips/dwelling unit	- -	- -
Single Family Detached:				
Urbanized Area [1]	9 trips/dwelling unit	9 trips/dwelling unit	8% (2:8)	10% (7:3)
Urbanizing Area [1]	10 trips/dwelling unit	10 trips/dwelling unit	8% (2:8)	10% (7:3)
TRANSPORTATION FACILITIES [3]				
Bus Depot	25 trips/1,000 sq. ft.	25 trips/1,000 sq. ft.		
Park & Ride Lots	400 trips/acre; 600 trips/paved acre	400 trips/acre; 600 trips/paved acre	14% (7:3)	15% (3:7)
Transit Station (rail)	300 trips/acre	300 trips/acre	14% (7:3)	15% (3:7)

Notes:

(1) From the 1990 Trip Generation Manual. Driveway rates reflect trips that are generated by a site. These rates are used to calculate the total number of trips that impact the project and its immediate vicinity.

(2) Does not include trip rates for Centre City area. See Table 5.

(3) San Diego Association of Governments (SANDAG), "Traffic Generators," San Diego, California, December 1996, and July 1998.

(4) City of San Diego memo, "Trip Generation Rate for Churches," December 9, 1992.

(5) Refer to Cumulative Vehicle Trip Rate column for reduced trip rates.

(6) Ln = Natural logarithm; fitted curve logarithmic equation is used for Commercial Office and Regional Shopping Center. For example, the trip generation of an Office Building with 100,000 sq. ft. of GLA is: Ln(T) = 0.756 Ln(100) + 3.95, or Ln(T) = 0.756 (4.60517) + 3.95, or Ln(T) = 3.481509 + 3.95, or Ln(T) = 7.431509, which is 1,688 trips. The trip generation of a Regional Shopping Center with 1,000,000 sq. ft. of GLA is: Ln(T) = 0.756 Ln(1,000) + 5.25, or Ln(T) = 0.756 (6.907755) + 5.25, or Ln(T) = 5.222263 + 5.25, or Ln(T) = 10.47226, which is 35,322 trips. See Table 2 for calculated trip generation for selected sizes of Regional Shopping Centers, and Table 3 for calculated trip generation for selected sizes of Commercial Offices. GLA = Gross Leasable Area; T = trips; x = GLA in 1,000 square feet.

(7) Institute of Transportation Engineers, "Trip Generation," 5th and 6th Editions, Washington, District of Columbia, 1991 and 1998.

(8) Trips made to a site are Pass-By and Cumulative trips. See Appendix A for definitions of these trips. Cumulative rates are used to determine the community-wide impact of a new project.

Appendix L

SANDAG Select Zone Assignment and Internal Capture Rate

SANDAG
Series 13 2050rc

Otay Mesa Area
Pardee South Otay

Version 13.3.2
Scenario ID 981
2050rc_c

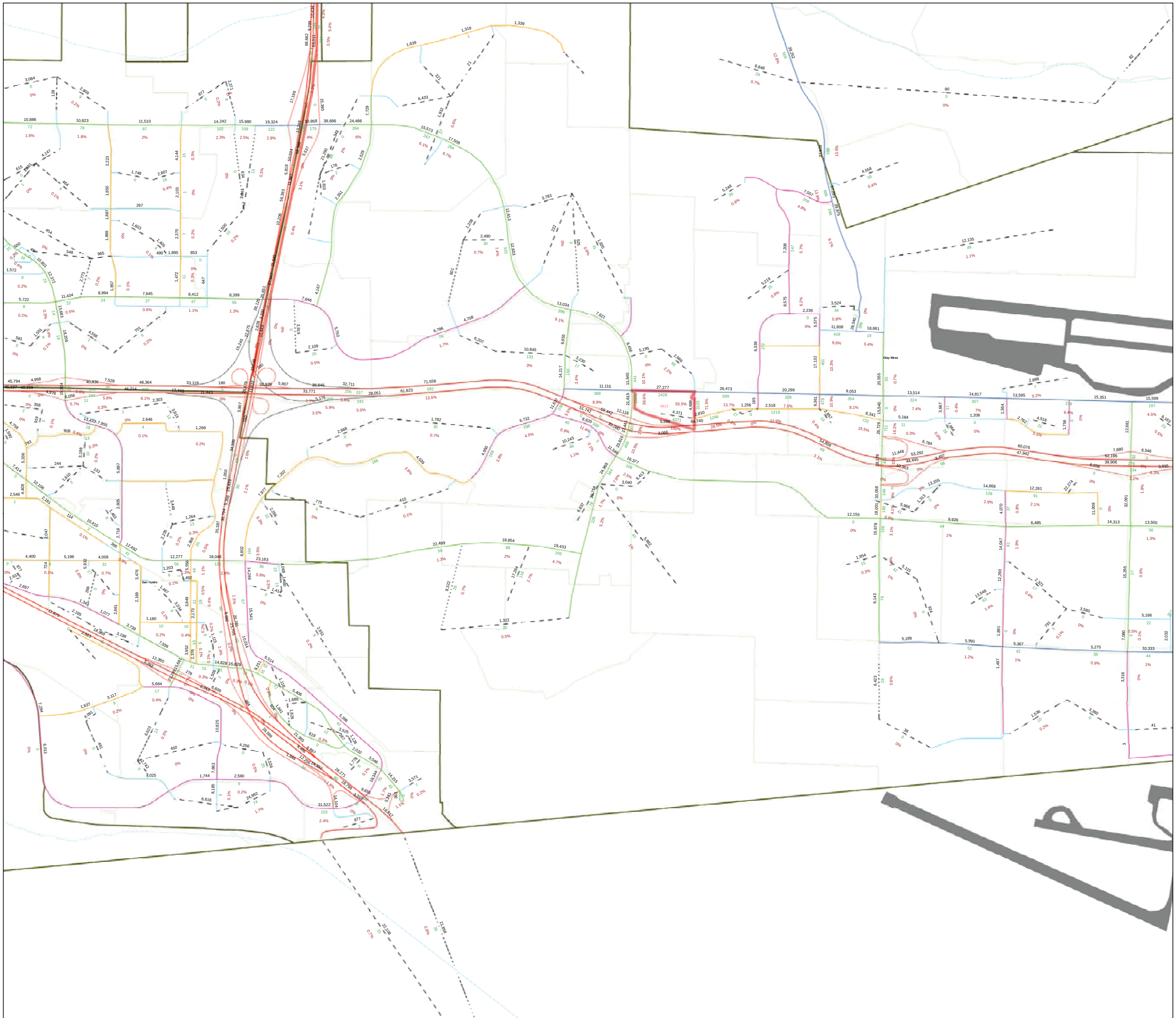
Select Zone 1
Pardee PA61I

Functional Classifications:

- Freeway
- Prime
- Major
- Collector
- Local Collector
- Rural Collector
- Local Road
- Freeway Ramp
- Local Ramp
- Zone Connectors

Average Daily Traffic

- # 24-Hour Total Flow (ADT)
- # Select Zone Volume
- # Select Zone Percentage



SAN DIEGO ASSOCIATION OF GOVERNMENTS
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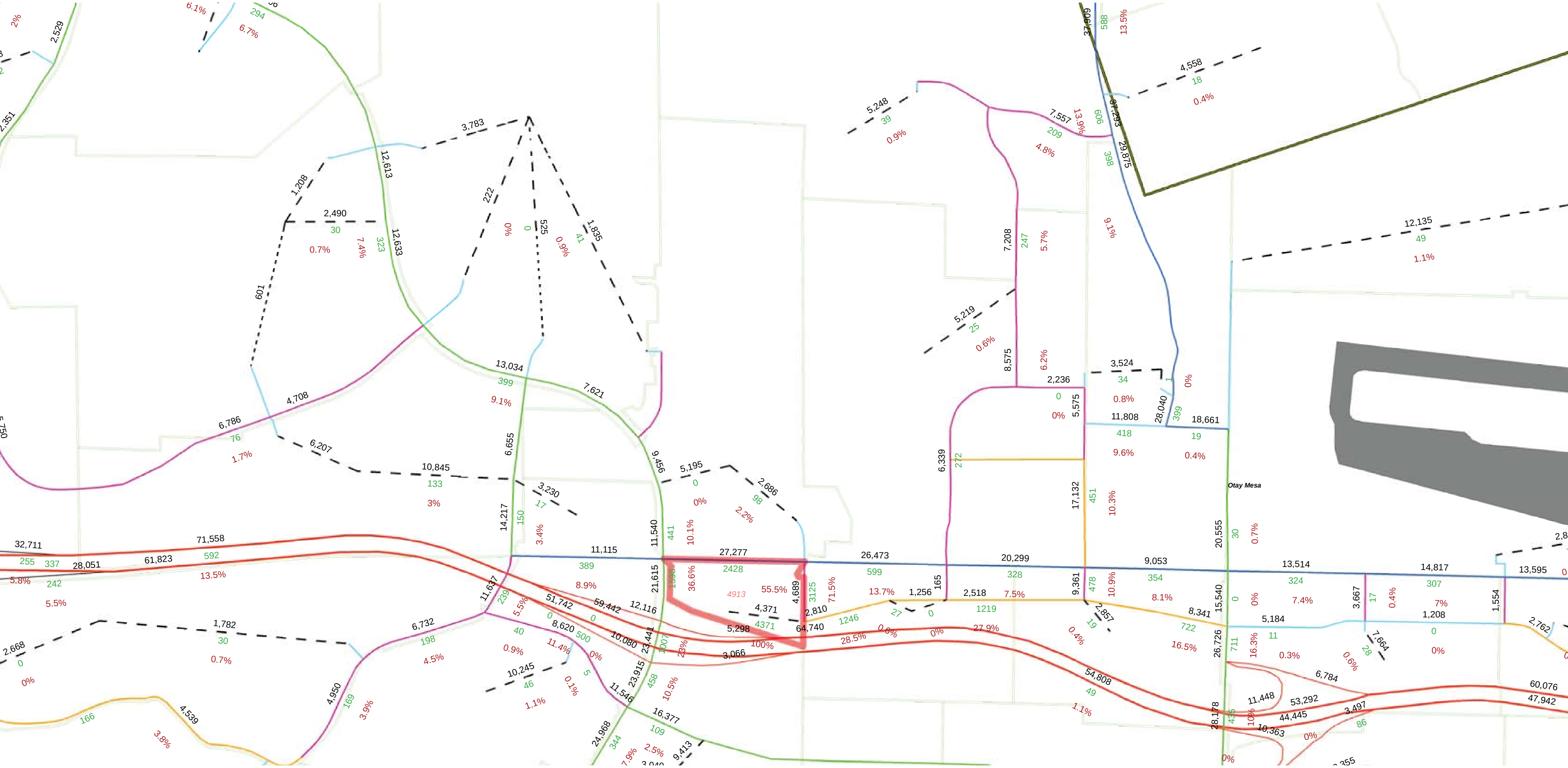
0 0.1 0.2 0.3
Miles

SANDAG
servicebureau

6/25/2018


Otay Mesa

SANDAG S13 2050rc ID 981 run date 6/25/18

scenario_id	taz	Intra	Inter	TotalTrips	IntraPercent
981	4913	167	5874	6041	**2.8%**

Appendix M

Existing with Project Level of Service Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	4	6	76	7	53	5	553	40	42	550	22
Future Volume (veh/h)	60	4	6	76	7	53	5	553	40	42	550	22
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.98	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	63	4	6	80	7	56	5	582	42	44	579	23
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	136	9	13	112	10	78	9	1296	93	63	1449	58
Arrive On Green	0.09	0.09	0.09	0.12	0.12	0.12	0.01	0.39	0.39	0.04	0.42	0.42
Sat Flow, veh/h	1520	96	145	949	83	664	1774	3343	241	1774	3466	138
Grp Volume(v), veh/h	73	0	0	143	0	0	5	308	316	44	295	307
Grp Sat Flow(s),veh/h/ln	1761	0	0	1696	0	0	1774	1770	1814	1774	1770	1834
Q Serve(g_s), s	2.1	0.0	0.0	4.4	0.0	0.0	0.2	7.0	7.0	1.3	6.3	6.3
Cycle Q Clear(g_c), s	2.1	0.0	0.0	4.4	0.0	0.0	0.2	7.0	7.0	1.3	6.3	6.3
Prop In Lane	0.86		0.08	0.56		0.39	1.00		0.13	1.00		0.07
Lane Grp Cap(c), veh/h	157	0	0	200	0	0	9	686	703	63	740	767
V/C Ratio(X)	0.46	0.00	0.00	0.72	0.00	0.00	0.53	0.45	0.45	0.69	0.40	0.40
Avail Cap(c_a), veh/h	881	0	0	849	0	0	134	686	703	157	740	767
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	0.0	0.0	23.0	0.0	0.0	26.9	12.3	12.3	25.8	11.0	11.0
Incr Delay (d2), s/veh	2.1	0.0	0.0	4.7	0.0	0.0	38.6	2.1	2.1	12.7	1.6	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	2.3	0.0	0.0	0.2	3.7	3.9	0.9	3.4	3.5
LnGrp Delay(d),s/veh	25.6	0.0	0.0	27.7	0.0	0.0	65.4	14.4	14.4	38.5	12.6	12.6
LnGrp LOS	C			C			E	B	B	D	B	B
Approach Vol, veh/h		73			143			629			646	
Approach Delay, s/veh		25.6			27.7			14.8			14.4	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	28.4		11.3	6.3	26.8		9.7
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	4.1	* 22		27.1	4.8	21.0		27.1
Max Q Clear Time (g_c+I1), s	2.2	8.3		6.4	3.3	9.0		4.1
Green Ext Time (p_c), s	0.0	2.7		0.6	0.0	2.7		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Notes

LOS Engineering, Inc.

Intersection						
Int Delay, s/veh	1.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	82	27	10	546	511	90
Future Vol, veh/h	82	27	10	546	511	90
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	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	89	29	11	593	555	98

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	939	343	661	0	-	0
Stage 1	612	-	-	-	-	-
Stage 2	327	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	263	653	923	-	-	-
Stage 1	504	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	256	644	917	-	-	-
Mov Cap-2 Maneuver	374	-	-	-	-	-
Stage 1	494	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	917	-	417	-	-
HCM Lane V/C Ratio	0.012	-	0.284	-	-
HCM Control Delay (s)	9	-	17	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	1.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	22	368	7	36	33	336	212	19	18	235	277
Future Volume (veh/h)	305	22	368	7	36	33	336	212	19	18	235	277
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.97		0.98	1.00		0.97	1.00		0.98
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	359	26	433	8	42	39	395	249	22	21	276	326
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	599	622	505	338	180	167	461	1892	164	32	498	437
Arrive On Green	0.17	0.33	0.33	0.04	0.20	0.20	0.13	0.40	0.40	0.02	0.28	0.28
Sat Flow, veh/h	1774	1863	1514	1774	882	819	3442	4756	411	1774	1770	1552
Grp Volume(v), veh/h	359	26	433	8	0	81	395	176	95	21	276	326
Grp Sat Flow(s),veh/h/ln	1774	1863	1514	1774	0	1702	1721	1695	1777	1774	1770	1552
Q Serve(g_s), s	14.2	0.9	24.8	0.3	0.0	3.7	10.4	3.1	3.2	1.1	12.3	17.8
Cycle Q Clear(g_c), s	14.2	0.9	24.8	0.3	0.0	3.7	10.4	3.1	3.2	1.1	12.3	17.8
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	599	622	505	338	0	347	461	1348	707	32	498	437
V/C Ratio(X)	0.60	0.04	0.86	0.02	0.00	0.23	0.86	0.13	0.13	0.66	0.55	0.75
Avail Cap(c_a), veh/h	599	721	586	569	0	659	466	1348	707	105	498	437
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	20.9	28.9	26.5	0.0	31.0	39.4	17.8	17.8	45.4	28.4	30.4
Incr Delay (d2), s/veh	1.7	0.0	10.8	0.0	0.0	0.3	14.4	0.2	0.4	20.6	4.4	11.0
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	7.1	0.5	11.9	0.2	0.0	1.8	5.9	1.5	1.6	0.7	6.7	8.9
LnGrp Delay(d),s/veh	23.0	21.0	39.7	26.5	0.0	31.3	53.8	18.0	18.2	66.0	32.8	41.4
LnGrp LOS	C	C	D	C		C	D	B	B	E	C	D
Approach Vol, veh/h		818			89			666			623	
Approach Delay, s/veh		31.8			30.9			39.3			38.4	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.9	31.8	20.5	23.9	6.1	42.6	8.4	36.0
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	12.6	* 26	16.1	36.0	5.5	33.1	16.1	36.0
Max Q Clear Time (g_c+I1), s	12.4	19.8	16.2	5.7	3.1	5.2	2.3	26.8
Green Ext Time (p_c), s	0.0	1.9	0.0	0.4	0.0	1.5	0.0	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	35.9
HCM 2010 LOS	D

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	4	14	0	42	3	511	12	26	580	4
Future Volume (veh/h)	3	0	4	14	0	42	3	511	12	26	580	4
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.96	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	3	0	4	16	0	47	3	568	13	29	644	4
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
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	17	0	23	80	0	72	6	2714	62	46	2888	18
Arrive On Green	0.02	0.00	0.02	0.05	0.00	0.05	0.00	0.53	0.53	0.03	0.55	0.55
Sat Flow, veh/h	704	0	939	1774	0	1583	1774	5110	117	1774	5213	32
Grp Volume(v), veh/h	7	0	0	16	0	47	3	376	205	29	419	229
Grp Sat Flow(s),veh/h/ln	1644	0	0	1774	0	1583	1774	1695	1837	1774	1695	1855
Q Serve(g_s), s	0.2	0.0	0.0	0.5	0.0	1.6	0.1	3.2	3.2	0.9	3.4	3.4
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.5	0.0	1.6	0.1	3.2	3.2	0.9	3.4	3.4
Prop In Lane	0.43		0.57	1.00		1.00	1.00		0.06	1.00		0.02
Lane Grp Cap(c), veh/h	40	0	0	80	0	72	6	1801	976	46	1878	1028
V/C Ratio(X)	0.17	0.00	0.00	0.20	0.00	0.66	0.52	0.21	0.21	0.63	0.22	0.22
Avail Cap(c_a), veh/h	941	0	0	1120	0	1000	151	1801	976	249	1878	1028
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	0.0	0.0	24.9	0.0	25.4	26.9	6.7	6.7	26.1	6.1	6.1
Incr Delay (d2), s/veh	2.0	0.0	0.0	1.2	0.0	9.8	57.3	0.3	0.5	13.0	0.3	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	0.1	0.0	0.0	0.3	0.0	0.9	0.1	1.5	1.7	0.6	1.6	1.9
LnGrp Delay(d),s/veh	27.9	0.0	0.0	26.1	0.0	35.2	84.3	7.0	7.2	39.1	6.4	6.6
LnGrp LOS	C			C		D	F	A	A	D	A	A
Approach Vol, veh/h		7			63			584			677	
Approach Delay, s/veh		27.9			32.9			7.4			7.9	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.6	36.0		7.3	5.8	34.8		6.2
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	4.6	30.0		34.2	7.6	27.0		31.0
Max Q Clear Time (g_c+I1), s	2.1	5.4		3.6	2.9	5.2		2.2
Green Ext Time (p_c), s	0.0	3.8		0.2	0.0	3.3		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		9.0
HCM 2010 LOS		A

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	
Lane Configurations								
Traffic Volume (veh/h)	56	9	54	544	22	5	540	
Future Volume (veh/h)	56	9	54	544	22	5	540	
Number	7	14		6	16	5	2	
Initial Q (Qb), veh	0	0		0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00			0.96	1.00		
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863	
Adj Flow Rate, veh/h	60	10		585	24	5	581	
Adj No. of Lanes	1	1		3	0	1	3	
Peak Hour Factor	0.93	0.93		0.93	0.93	0.93	0.93	
Percent Heavy Veh, %	2	2		2	2	2	2	
Cap, veh/h	90	80		3149	128	10	3707	
Arrive On Green	0.05	0.05		0.63	0.63	0.01	0.73	
Sat Flow, veh/h	1774	1583		5171	204	1774	5253	
Grp Volume(v), veh/h	60	10		395	214	5	581	
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1817	1774	1695	
Q Serve(g_s), s	1.6	0.3		2.3	2.4	0.1	1.7	
Cycle Q Clear(g_c), s	1.6	0.3		2.3	2.4	0.1	1.7	
Prop In Lane	1.00	1.00			0.11	1.00		
Lane Grp Cap(c), veh/h	90	80		2133	1144	10	3707	
V/C Ratio(X)	0.67	0.12		0.19	0.19	0.52	0.16	
Avail Cap(c_a), veh/h	1154	1030		2133	1144	149	3707	
HCM Platoon Ratio	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	
Uniform Delay (d), s/veh	22.2	21.6		3.7	3.7	23.6	2.0	
Incr Delay (d2), s/veh	8.2	0.7		0.2	0.4	38.1	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.0	0.3		1.1	1.2	0.2	0.8	
LnGrp Delay(d),s/veh	30.4	22.3		3.9	4.1	61.8	2.1	
LnGrp LOS	C	C		A	A	E	A	
Approach Vol, veh/h	70			609			586	
Approach Delay, s/veh	29.3			4.0			2.6	
Approach LOS	C			A			A	
Timer	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		40.8		6.9	4.8	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		29.2		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		3.7		3.6	2.1	4.4		
Green Ext Time (p_c), s		3.7		0.2	0.0	3.6		
Intersection Summary								
HCM 2010 Ctrl Delay			4.7					
HCM 2010 LOS			A					
Notes								

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	8	5	303	10	146	5	347	591	217	487	1
Future Volume (veh/h)	0	8	5	303	10	146	5	347	591	217	487	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	9	5	329	11	159	5	377	642	236	529	1
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	2	231	114	504	524	556	12	1572	695	262	1818	785
Arrive On Green	0.00	0.07	0.07	0.15	0.28	0.28	0.01	0.44	0.44	0.08	0.51	0.51
Sat Flow, veh/h	1774	3539	1583	3442	1863	1552	1774	3539	1564	3442	3539	1528
Grp Volume(v), veh/h	0	9	5	329	11	159	5	377	642	236	529	1
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1552	1774	1770	1564	1721	1770	1528
Q Serve(g_s), s	0.0	0.2	0.2	6.8	0.3	5.5	0.2	5.0	29.0	5.1	6.4	0.0
Cycle Q Clear(g_c), s	0.0	0.2	0.2	6.8	0.3	5.5	0.2	5.0	29.0	5.1	6.4	0.0
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	2	231	114	504	524	556	12	1572	695	262	1818	785
V/C Ratio(X)	0.00	0.04	0.04	0.65	0.02	0.29	0.43	0.24	0.92	0.90	0.29	0.00
Avail Cap(c_a), veh/h	260	727	336	505	524	556	118	1572	695	262	1818	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)	0.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	32.9	32.4	30.2	19.5	17.3	37.1	13.0	19.7	34.4	10.4	8.9
Incr Delay (d2), s/veh	0.0	0.1	0.2	3.0	0.0	0.3	22.4	0.4	19.7	31.4	0.4	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	0.0	0.1	0.1	3.4	0.2	2.4	0.2	2.5	16.2	3.6	3.2	0.0
LnGrp Delay(d),s/veh	0.0	32.9	32.6	33.2	19.5	17.6	59.5	13.3	39.4	65.8	10.8	8.9
LnGrp LOS		C	C	C	B	B	E	B	D	E	B	A
Approach Vol, veh/h		14			499			1024			766	
Approach Delay, s/veh		32.8			27.9			29.9			27.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	38.4	16.2	10.0	5.2	43.6	0.0	26.2
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 5.7	22.8	* 11	15.4	* 5	23.5	* 11	15.4
Max Q Clear Time (g_c+I1), s	7.1	31.0	8.8	2.2	2.2	8.4	0.0	7.5
Green Ext Time (p_c), s	0.0	0.0	0.3	0.0	0.0	2.8	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	28.8
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	21	0	64	276	832	0	0	261	492
Future Volume (veh/h)	0	0	0	21	0	64	276	832	0	0	261	492
Number				3	8	18	5	2	12	1	6	16
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		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				23	0	70	303	914	0	0	287	541
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
Peak Hour Factor				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	0	0	2	2
Cap, veh/h				109	0	98	302	4106	0	0	1955	884
Arrive On Green				0.06	0.00	0.06	0.17	0.81	0.00	0.00	0.58	0.58
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	3558	1533
Grp Volume(v), veh/h				23	0	70	303	914	0	0	287	541
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1695	1533
Q Serve(g_s), s				1.0	0.0	3.4	13.3	3.3	0.0	0.0	3.1	18.0
Cycle Q Clear(g_c), s				1.0	0.0	3.4	13.3	3.3	0.0	0.0	3.1	18.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				109	0	98	302	4106	0	0	1955	884
V/C Ratio(X)				0.21	0.00	0.72	1.00	0.22	0.00	0.00	0.15	0.61
Avail Cap(c_a), veh/h				373	0	333	302	4106	0	0	1955	884
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.65	0.65	0.00	0.00	0.93	0.93
Uniform Delay (d), s/veh				34.8	0.0	35.9	32.3	1.8	0.0	0.0	7.6	10.8
Incr Delay (d2), s/veh				0.9	0.0	9.4	42.2	0.1	0.0	0.0	0.1	2.9
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				0.5	0.0	1.7	10.0	1.6	0.0	0.0	1.5	8.2
LnGrp Delay(d),s/veh				35.7	0.0	45.3	74.5	1.8	0.0	0.0	7.8	13.7
LnGrp LOS				D		D	F	A			A	B
Approach Vol, veh/h					93			1217			828	
Approach Delay, s/veh					42.9			19.9			11.7	
Approach LOS					D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		68.1			18.0	50.1		9.9
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		50.9			* 13	32.9		16.4
Max Q Clear Time (g_c+I1), s		5.3			15.3	20.0		5.4
Green Ext Time (p_c), s		7.0			0.0	4.4		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	604	1	486	0	0	0	0	516	59	97	272	0
Future Volume (veh/h)	604	1	486	0	0	0	0	516	59	97	272	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	666	101	593				0	629	72	118	332	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
Peak Hour Factor	0.82	0.82	0.82				0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	755	100	588				0	1351	153	149	1553	0
Arrive On Green	0.43	0.43	0.43				0.00	0.29	0.29	0.08	0.44	0.00
Sat Flow, veh/h	1774	236	1383				0	4796	524	1774	3632	0
Grp Volume(v), veh/h	666	0	694				0	459	242	118	332	0
Grp Sat Flow(s),veh/h/ln	1774	0	1619				0	1695	1762	1774	1770	0
Q Serve(g_s), s	25.9	0.0	31.9				0.0	8.3	8.5	4.9	4.4	0.0
Cycle Q Clear(g_c), s	25.9	0.0	31.9				0.0	8.3	8.5	4.9	4.4	0.0
Prop In Lane	1.00		0.85				0.00		0.30	1.00		0.00
Lane Grp Cap(c), veh/h	755	0	688				0	990	515	149	1553	0
V/C Ratio(X)	0.88	0.00	1.01				0.00	0.46	0.47	0.79	0.21	0.00
Avail Cap(c_a), veh/h	755	0	688				0	990	515	149	1553	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.95	0.95	0.00
Uniform Delay (d), s/veh	19.8	0.0	21.6				0.0	21.7	21.8	33.7	13.0	0.0
Incr Delay (d2), s/veh	11.9	0.0	36.3				0.0	1.6	3.1	23.4	0.3	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
%ile BackOfQ(50%),veh/ln	15.1	0.0	21.1				0.0	4.1	4.5	3.4	2.2	0.0
LnGrp Delay(d),s/veh	31.8	0.0	57.9				0.0	23.3	24.9	57.1	13.3	0.0
LnGrp LOS	C		F					C	C	E	B	
Approach Vol, veh/h		1360						701			450	
Approach Delay, s/veh		45.1						23.8			24.8	
Approach LOS		D						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	11.0	27.0		37.0		38.0		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 6.3	21.9		31.9		32.9		
Max Q Clear Time (g_c+I1), s	6.9	10.5		33.9		6.4		
Green Ext Time (p_c), s	0.0	3.2		0.0		2.0		

Intersection Summary	
HCM 2010 Ctrl Delay	35.5
HCM 2010 LOS	D

Notes

Intersection	
Intersection Delay, s/veh	129.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	369	1	7	0	1	56	4	195	0	35	277	431
Future Vol, veh/h	369	1	7	0	1	56	4	195	0	35	277	431
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	543	1	10	0	1	82	6	287	0	51	407	634
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	30.1	15.4	16.4	218.8
HCM LOS	D	C	C	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	96%	0%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	100%	0%	1%	100%	100%	0%	0%	100%	18%
Vol Right, %	0%	0%	0%	0%	4%	0%	0%	100%	0%	0%	82%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	98	98	188	189	0	1	56	35	185	523
LT Vol	4	0	0	188	181	0	0	0	35	0	0
Through Vol	0	98	98	0	1	0	1	0	0	185	92
RT Vol	0	0	0	0	7	0	0	56	0	0	431
Lane Flow Rate	6	143	143	277	278	0	1	82	51	272	770
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.016	0.367	0.297	0.679	0.678	0	0.004	0.21	0.123	0.611	1.606
Departure Headway (Hd)	10.584	10.064	8.26	9.544	9.496	10.801	10.801	10.083	8.62	8.105	7.512
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	340	360	437	382	383	0	333	358	416	445	485
Service Time	8.284	7.764	5.96	7.244	7.196	8.501	8.501	7.783	6.364	5.849	5.256
HCM Lane V/C Ratio	0.018	0.397	0.327	0.725	0.726	0	0.003	0.229	0.123	0.611	1.588
HCM Control Delay	13.5	18.5	14.4	30.2	30	13.5	13.5	15.4	12.6	22.8	301.7
HCM Lane LOS	B	C	B	D	D	N	B	C	B	C	F
HCM 95th-tile Q	0	1.6	1.2	4.8	4.8	0	0	0.8	0.4	4	42.8

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↱		↑↑↑		↱
Traffic Vol, veh/h	710	106	0	0	0	92
Future Vol, veh/h	710	106	0	0	0	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	-	-	-	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	772	115	0	0	0	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	386
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	523
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	523
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	523	-	-	-
HCM Lane V/C Ratio	0.191	-	-	-
HCM Control Delay (s)	13.5	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.7	-	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	74	723	5	38	253	1	61	4	28	35	3	72
Future Vol, veh/h	74	723	5	38	253	1	61	4	28	35	3	72
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	250	-	250	250	-	400	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	92	92	91	91	92	92	92	91	92	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	81	795	5	41	278	1	66	4	30	38	3	79

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	279	0	0	800	0	0	1152	1318	398	842	1322	139
Stage 1	-	-	-	-	-	-	957	957	-	360	360	-
Stage 2	-	-	-	-	-	-	195	361	-	482	962	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	859	-	-	488	-	-	208	156	514	316	155	751
Stage 1	-	-	-	-	-	-	213	334	-	544	625	-
Stage 2	-	-	-	-	-	-	724	624	-	488	332	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	859	-	-	488	-	-	159	129	514	252	129	751
Mov Cap-2 Maneuver	-	-	-	-	-	-	159	129	-	252	129	-
Stage 1	-	-	-	-	-	-	193	303	-	493	573	-
Stage 2	-	-	-	-	-	-	590	572	-	410	301	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.7	33.5	16.7
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	159	374	859	-	-	488	-	-	427
HCM Lane V/C Ratio	0.417	0.093	0.095	-	-	0.085	-	-	0.283
HCM Control Delay (s)	42.9	15.6	9.6	-	-	13.1	-	-	16.7
HCM Lane LOS	E	C	A	-	-	B	-	-	C
HCM 95th %tile Q(veh)	1.9	0.3	0.3	-	-	0.3	-	-	1.2

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	333	350	1	217	38	28	93
Future Volume (veh/h)	333	350	1	217	38	28	93
Number	5	2		6	16	7	14
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00				1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1863	1863	1863
Adj Flow Rate, veh/h	374	393		244	43	31	104
Adj No. of Lanes	2	3		3	1	1	2
Peak Hour Factor	0.89	0.89		0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	497	1701		695	216	913	1434
Arrive On Green	0.14	0.33		0.14	0.14	0.51	0.51
Sat Flow, veh/h	3442	5253		5253	1578	1774	2787
Grp Volume(v), veh/h	374	393		244	43	31	104
Grp Sat Flow(s),veh/h/ln	1721	1695		1695	1578	1774	1393
Q Serve(g_s), s	7.8	4.2		3.3	1.8	0.6	1.4
Cycle Q Clear(g_c), s	7.8	4.2		3.3	1.8	0.6	1.4
Prop In Lane	1.00				1.00	1.00	1.00
Lane Grp Cap(c), veh/h	497	1701		695	216	913	1434
V/C Ratio(X)	0.75	0.23		0.35	0.20	0.03	0.07
Avail Cap(c_a), veh/h	1012	3479		2344	727	913	1434
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	30.7	18.0		29.3	28.7	9.0	9.2
Incr Delay (d2), s/veh	2.3	0.1		0.3	0.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	1.9		1.5	0.8	0.3	1.6
LnGrp Delay(d),s/veh	33.1	18.0		29.6	29.1	9.0	9.3
LnGrp LOS	C	B		C	C	A	A
Approach Vol, veh/h		767		287		135	
Approach Delay, s/veh		25.4		29.5		9.2	
Approach LOS		C		C		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		32.3		42.5	14.8	17.5		
Change Period (Y+Rc), s		7.3		4.0	4.0	* 7.3		
Max Green Setting (Gmax), s		51.2		38.5	22.0	* 35		
Max Q Clear Time (g_c+I1), s		6.2		3.4	9.8	5.3		
Green Ext Time (p_c), s		2.5		0.4	1.0	1.6		

Intersection Summary		
HCM 2010 Ctrl Delay		24.5
HCM 2010 LOS		C

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	460	3	0	292	34	0	0	5	0	0	47
Future Vol, veh/h	0	460	3	0	292	34	0	0	5	0	0	47
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	500	3	0	317	37	0	0	5	0	0	51

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	252	-	-	159
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	637	0	0	730
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	637	-	-	730
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.7	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	637	-	-	-	-	730
HCM Lane V/C Ratio	0.009	-	-	-	-	0.07
HCM Control Delay (s)	10.7	-	-	-	-	10.3
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	133	110	37	147	116	57	33	38	86	23	70
Future Volume (veh/h)	136	133	110	37	147	116	57	33	38	86	23	70
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	146	143	118	40	158	125	61	35	41	92	25	75
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	802	246	106	616	192	78	345	405	118	870	1302
Arrive On Green	0.07	0.16	0.16	0.03	0.12	0.12	0.04	0.44	0.44	0.07	0.47	0.47
Sat Flow, veh/h	3442	5085	1562	3442	5085	1583	1774	777	910	1774	1863	2787
Grp Volume(v), veh/h	146	143	118	40	158	125	61	0	76	92	25	75
Grp Sat Flow(s),veh/h/ln	1721	1695	1562	1721	1695	1583	1774	0	1687	1774	1863	1393
Q Serve(g_s), s	2.9	1.7	4.9	0.8	2.0	5.3	2.4	0.0	1.9	3.6	0.5	1.0
Cycle Q Clear(g_c), s	2.9	1.7	4.9	0.8	2.0	5.3	2.4	0.0	1.9	3.6	0.5	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	232	802	246	106	616	192	78	0	750	118	870	1302
V/C Ratio(X)	0.63	0.18	0.48	0.38	0.26	0.65	0.78	0.00	0.10	0.78	0.03	0.06
Avail Cap(c_a), veh/h	427	2941	904	218	2633	820	230	0	750	175	870	1302
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	25.9	27.2	33.7	28.3	29.7	33.6	0.0	11.5	32.6	10.2	10.3
Incr Delay (d2), s/veh	2.8	0.1	1.4	2.2	0.2	3.7	15.6	0.0	0.3	12.2	0.1	0.1
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	1.5	0.8	2.2	0.4	0.9	2.5	1.5	0.0	0.9	2.2	0.3	0.4
LnGrp Delay(d),s/veh	35.0	26.0	28.6	35.9	28.5	33.4	49.1	0.0	11.7	44.8	10.3	10.4
LnGrp LOS	C	C	C	D	C	C	D		B	D	B	B
Approach Vol, veh/h		407			323			137			192	
Approach Delay, s/veh		30.0			31.3			28.4			26.9	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	40.5	8.8	14.5	8.7	38.9	6.2	17.1
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	9.2	29.0	8.8	36.7	7.0	* 32	4.5	41.0
Max Q Clear Time (g_c+I1), s	4.4	3.0	4.9	7.3	5.6	3.9	2.8	6.9
Green Ext Time (p_c), s	0.0	0.3	0.1	1.3	0.0	0.3	0.0	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	29.6
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	1	9	35	0	53	8	578	42	147	490	20
Future Volume (veh/h)	14	1	9	35	0	53	8	578	42	147	490	20
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.99	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	16	1	10	40	0	60	9	657	48	167	557	23
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	44	3	27	68	0	102	17	1178	86	211	1599	66
Arrive On Green	0.04	0.04	0.04	0.10	0.00	0.10	0.01	0.35	0.35	0.12	0.46	0.46
Sat Flow, veh/h	1008	63	630	662	0	993	1774	3344	244	1774	3463	143
Grp Volume(v), veh/h	27	0	0	100	0	0	9	347	358	167	284	296
Grp Sat Flow(s),veh/h/ln	1701	0	0	1654	0	0	1774	1770	1818	1774	1770	1836
Q Serve(g_s), s	0.8	0.0	0.0	3.0	0.0	0.0	0.3	8.3	8.3	4.8	5.4	5.4
Cycle Q Clear(g_c), s	0.8	0.0	0.0	3.0	0.0	0.0	0.3	8.3	8.3	4.8	5.4	5.4
Prop In Lane	0.59		0.37	0.40		0.60	1.00		0.13	1.00		0.08
Lane Grp Cap(c), veh/h	74	0	0	170	0	0	17	623	640	211	817	848
V/C Ratio(X)	0.37	0.00	0.00	0.59	0.00	0.00	0.54	0.56	0.56	0.79	0.35	0.35
Avail Cap(c_a), veh/h	879	0	0	855	0	0	139	623	640	258	817	848
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	0.0	0.0	22.4	0.0	0.0	25.8	13.6	13.6	22.4	9.0	9.0
Incr Delay (d2), s/veh	3.0	0.0	0.0	3.2	0.0	0.0	24.6	3.6	3.5	12.7	1.2	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	0.4	0.0	0.0	1.5	0.0	0.0	0.2	4.6	4.7	3.1	2.9	3.0
LnGrp Delay(d),s/veh	27.3	0.0	0.0	25.6	0.0	0.0	50.4	17.2	17.1	35.1	10.2	10.2
LnGrp LOS	C			C			D	B	B	D	B	B
Approach Vol, veh/h		27			100			714			747	
Approach Delay, s/veh		27.3			25.6			17.6			15.7	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.9	29.9		10.3	10.6	24.2		7.2
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	4.1	* 22		27.0	7.6	18.4		27.0
Max Q Clear Time (g_c+I1), s	2.3	7.4		5.0	6.8	10.3		2.8
Green Ext Time (p_c), s	0.0	2.7		0.4	0.0	2.5		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	25	23	585	493	50
Future Vol, veh/h	37	25	23	585	493	50
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	29	27	680	573	58

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1012	332	639	0	-	0
Stage 1	610	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	236	664	941	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	644	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	226	655	935	-	-	-
Mov Cap-2 Maneuver	348	-	-	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	639	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.1	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	935	-	429	-	-
HCM Lane V/C Ratio	0.029	-	0.168	-	-
HCM Control Delay (s)	9	-	15.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	2	110	15	3	20	141	485	20	35	332	153
Future Volume (veh/h)	99	2	110	15	3	20	141	485	20	35	332	153
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.97	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	121	2	134	18	4	24	172	591	24	43	405	187
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	418	301	252	362	30	178	266	2348	95	58	999	455
Arrive On Green	0.09	0.16	0.16	0.06	0.13	0.13	0.08	0.47	0.47	0.03	0.42	0.42
Sat Flow, veh/h	1774	1863	1563	1774	231	1384	3442	5007	202	1774	2355	1074
Grp Volume(v), veh/h	121	2	134	18	0	28	172	399	216	43	303	289
Grp Sat Flow(s),veh/h/ln	1774	1863	1563	1774	0	1615	1721	1695	1819	1774	1770	1660
Q Serve(g_s), s	3.9	0.1	5.4	0.6	0.0	1.1	3.3	4.9	4.9	1.6	8.2	8.3
Cycle Q Clear(g_c), s	3.9	0.1	5.4	0.6	0.0	1.1	3.3	4.9	4.9	1.6	8.2	8.3
Prop In Lane	1.00		1.00	1.00		0.86	1.00		0.11	1.00		0.65
Lane Grp Cap(c), veh/h	418	301	252	362	0	208	266	1590	853	58	751	704
V/C Ratio(X)	0.29	0.01	0.53	0.05	0.00	0.13	0.65	0.25	0.25	0.74	0.40	0.41
Avail Cap(c_a), veh/h	690	980	822	679	0	838	482	1590	853	197	751	704
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	24.2	26.4	23.1	0.0	26.5	30.7	11.0	11.0	32.9	13.7	13.8
Incr Delay (d2), s/veh	0.4	0.0	1.7	0.1	0.0	0.3	2.6	0.4	0.7	17.0	1.6	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	2.4	0.3	0.0	0.5	1.7	2.4	2.6	1.1	4.3	4.1
LnGrp Delay(d),s/veh	22.9	24.2	28.1	23.1	0.0	26.8	33.4	11.3	11.7	49.9	15.3	15.5
LnGrp LOS	C	C	C	C		C	C	B	B	D	B	B
Approach Vol, veh/h		257			46			787			635	
Approach Delay, s/veh		25.7			25.4			16.3			17.8	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	34.7	10.5	13.7	6.6	37.8	8.2	16.0
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	9.6	* 29	16.6	35.6	7.6	30.9	16.1	36.1
Max Q Clear Time (g_c+I1), s	5.3	10.3	5.9	3.1	3.6	6.9	2.6	7.4
Green Ext Time (p_c), s	0.2	3.2	0.2	0.1	0.0	3.6	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	18.5
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	5	24	0	28	1	632	30	45	413	0
Future Volume (veh/h)	3	0	5	24	0	28	1	632	30	45	413	0
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	4	0	6	31	0	36	1	810	38	58	529	0
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	15	0	23	91	0	80	3	2539	119	76	2810	0
Arrive On Green	0.02	0.00	0.02	0.05	0.00	0.05	0.00	0.51	0.51	0.04	0.55	0.00
Sat Flow, veh/h	657	0	985	1774	0	1577	1774	4970	232	1774	5253	0
Grp Volume(v), veh/h	10	0	0	31	0	36	1	552	296	58	529	0
Grp Sat Flow(s),veh/h/ln	1642	0	0	1774	0	1577	1774	1695	1812	1774	1695	0
Q Serve(g_s), s	0.3	0.0	0.0	0.9	0.0	1.2	0.0	5.2	5.2	1.8	2.8	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.9	0.0	1.2	0.0	5.2	5.2	1.8	2.8	0.0
Prop In Lane	0.40		0.60	1.00		1.00	1.00		0.13	1.00		0.00
Lane Grp Cap(c), veh/h	38	0	0	91	0	80	3	1732	926	76	2810	0
V/C Ratio(X)	0.26	0.00	0.00	0.34	0.00	0.45	0.31	0.32	0.32	0.76	0.19	0.00
Avail Cap(c_a), veh/h	938	0	0	1131	0	1005	137	1732	926	314	2810	0
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.1	0.0	0.0	24.9	0.0	25.0	27.1	7.8	7.8	25.7	6.1	0.0
Incr Delay (d2), s/veh	3.6	0.0	0.0	2.2	0.0	3.9	45.8	0.5	0.9	14.3	0.1	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	0.2	0.0	0.0	0.5	0.0	0.6	0.1	2.5	2.8	1.2	1.4	0.0
LnGrp Delay(d),s/veh	29.7	0.0	0.0	27.1	0.0	28.9	72.8	8.2	8.7	40.0	6.2	0.0
LnGrp LOS	C			C		C	E	A	A	D	A	
Approach Vol, veh/h		10			67			849			587	
Approach Delay, s/veh		29.7			28.1			8.5			9.6	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	36.0		7.7	6.7	33.7		6.2
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	4.2	30.0		34.6	9.6	24.6		31.0
Max Q Clear Time (g_c+I1), s	2.0	4.8		3.2	3.8	7.2		2.3
Green Ext Time (p_c), s	0.0	3.3		0.2	0.0	4.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	41	9	33	648	59	8	434
Future Volume (veh/h)	41	9	33	648	59	8	434
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.97	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	53	12		842	77	10	564
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.77	0.77		0.77	0.77	0.77	0.77
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	86	77		2969	270	18	3722
Arrive On Green	0.05	0.05		0.63	0.63	0.01	0.73
Sat Flow, veh/h	1774	1583		4899	431	1774	5253
Grp Volume(v), veh/h	53	12		602	317	10	564
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1772	1774	1695
Q Serve(g_s), s	1.4	0.3		3.8	3.9	0.3	1.6
Cycle Q Clear(g_c), s	1.4	0.3		3.8	3.9	0.3	1.6
Prop In Lane	1.00	1.00			0.24	1.00	
Lane Grp Cap(c), veh/h	86	77		2127	1112	18	3722
V/C Ratio(X)	0.62	0.16		0.28	0.28	0.54	0.15
Avail Cap(c_a), veh/h	1150	1027		2127	1112	148	3722
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.3	21.8		4.0	4.0	23.5	1.9
Incr Delay (d2), s/veh	7.0	0.9		0.3	0.6	22.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.3		1.9	2.0	0.2	0.8
LnGrp Delay(d),s/veh	29.3	22.8		4.4	4.7	46.0	2.0
LnGrp LOS	C	C		A	A	D	A
Approach Vol, veh/h	65			919			574
Approach Delay, s/veh	28.1			4.5			2.8
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.0		6.8	5.0	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		29.5		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		3.6		3.4	2.3	5.9		
Green Ext Time (p_c), s		3.6		0.1	0.0	5.8		

Intersection Summary		
HCM 2010 Ctrl Delay		4.8
HCM 2010 LOS		A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	19	16	780	24	340	22	486	408	290	228	0
Future Volume (veh/h)	2	19	16	780	24	340	22	486	408	290	228	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	2	21	18	867	27	378	24	540	453	322	253	0
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
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	11	197	128	910	585	486	44	1247	969	359	1528	683
Arrive On Green	0.01	0.06	0.06	0.26	0.31	0.31	0.03	0.35	0.35	0.10	0.43	0.00
Sat Flow, veh/h	1774	3539	1583	3442	1863	1547	1774	3539	1562	3442	3539	1583
Grp Volume(v), veh/h	2	21	18	867	27	378	24	540	453	322	253	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1547	1774	1770	1562	1721	1770	1583
Q Serve(g_s), s	0.1	0.5	1.0	22.3	0.9	20.0	1.2	10.5	14.1	8.3	3.9	0.0
Cycle Q Clear(g_c), s	0.1	0.5	1.0	22.3	0.9	20.0	1.2	10.5	14.1	8.3	3.9	0.0
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	11	197	128	910	585	486	44	1247	969	359	1528	683
V/C Ratio(X)	0.19	0.11	0.14	0.95	0.05	0.78	0.54	0.43	0.47	0.90	0.17	0.00
Avail Cap(c_a), veh/h	217	606	311	910	585	486	108	1247	969	359	1528	683
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	0.97	0.97	0.97	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.5	40.4	38.5	32.5	21.5	28.0	43.4	22.3	9.3	39.8	15.7	0.0
Incr Delay (d2), s/veh	8.4	0.2	0.5	19.3	0.0	7.9	9.5	1.1	1.6	23.9	0.2	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	0.1	0.3	0.4	13.0	0.5	9.5	0.7	5.3	6.4	5.1	2.0	0.0
LnGrp Delay(d),s/veh	52.9	40.6	39.0	51.9	21.5	35.9	52.9	23.4	10.9	63.7	15.9	0.0
LnGrp LOS	D	D	D	D	C	D	D	C	B	E	B	
Approach Vol, veh/h		41			1272			1017			575	
Approach Delay, s/veh		40.5			46.5			18.5			42.7	
Approach LOS		D			D			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.1	36.8	29.0	10.1	7.0	43.9	5.7	33.4
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 9.4	21.3	* 24	15.4	* 5.5	25.2	* 11	28.2
Max Q Clear Time (g_c+I1), s	10.3	16.1	24.3	3.0	3.2	5.9	2.1	22.0
Green Ext Time (p_c), s	0.0	2.3	0.0	0.1	0.0	1.3	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	35.8
HCM 2010 LOS	D

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	36	0	98	458	844	0	0	242	716
Future Volume (veh/h)	0	0	0	36	0	98	458	844	0	0	242	716
Number				3	8	18	5	2	12	1	6	16
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		0.91
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				43	0	118	552	1017	0	0	292	863
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
Peak Hour Factor				0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				158	0	141	503	4248	0	0	1752	743
Arrive On Green				0.09	0.00	0.09	0.28	0.84	0.00	0.00	0.52	0.52
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	3558	1438
Grp Volume(v), veh/h				43	0	118	552	1017	0	0	292	863
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1695	1438
Q Serve(g_s), s				3.1	0.0	9.9	38.3	5.6	0.0	0.0	6.1	69.8
Cycle Q Clear(g_c), s				3.1	0.0	9.9	38.3	5.6	0.0	0.0	6.1	69.8
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				158	0	141	503	4248	0	0	1752	743
V/C Ratio(X)				0.27	0.00	0.84	1.10	0.24	0.00	0.00	0.17	1.16
Avail Cap(c_a), veh/h				204	0	182	503	4248	0	0	1752	743
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.50	0.50	0.00	0.00	0.56	0.56
Uniform Delay (d), s/veh				57.4	0.0	60.5	48.3	2.3	0.0	0.0	17.2	32.6
Incr Delay (d2), s/veh				0.9	0.0	22.5	58.7	0.1	0.0	0.0	0.1	81.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.5	0.0	5.2	26.9	2.6	0.0	0.0	2.9	44.4
LnGrp Delay(d),s/veh				58.3	0.0	83.0	107.0	2.4	0.0	0.0	17.4	113.9
LnGrp LOS				E		F	F	A			B	F
Approach Vol, veh/h					161			1569			1155	
Approach Delay, s/veh					76.4			39.2			89.5	
Approach LOS					E			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		117.9			43.0	74.9		17.1
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		109.3			* 38	66.3		15.5
Max Q Clear Time (g_c+I1), s		7.6			40.3	71.8		11.9
Green Ext Time (p_c), s		8.2			0.0	0.0		0.2

Intersection Summary			
HCM 2010 Ctrl Delay			61.4
HCM 2010 LOS			E

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	606	4	322	0	0	0	0	695	76	109	181	0
Future Volume (veh/h)	606	4	322	0	0	0	0	695	76	109	181	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	630	270	435				0	939	103	147	245	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
Peak Hour Factor	0.74	0.74	0.74				0.74	0.74	0.74	0.74	0.74	0.74
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	772	280	451				0	1284	140	181	1547	0
Arrive On Green	0.44	0.44	0.44				0.00	0.28	0.28	0.10	0.44	0.00
Sat Flow, veh/h	1774	643	1036				0	4814	508	1774	3632	0
Grp Volume(v), veh/h	630	0	705				0	684	358	147	245	0
Grp Sat Flow(s),veh/h/ln	1774	0	1680				0	1695	1765	1774	1770	0
Q Serve(g_s), s	24.9	0.0	32.7				0.0	14.6	14.7	6.5	3.3	0.0
Cycle Q Clear(g_c), s	24.9	0.0	32.7				0.0	14.6	14.7	6.5	3.3	0.0
Prop In Lane	1.00		0.62				0.00		0.29	1.00		0.00
Lane Grp Cap(c), veh/h	772	0	731				0	937	488	181	1547	0
V/C Ratio(X)	0.82	0.00	0.96				0.00	0.73	0.73	0.81	0.16	0.00
Avail Cap(c_a), veh/h	774	0	733				0	937	488	184	1547	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.76	0.76	0.00
Uniform Delay (d), s/veh	19.8	0.0	22.0				0.0	26.2	26.3	35.2	13.6	0.0
Incr Delay (d2), s/veh	6.8	0.0	24.6				0.0	5.0	9.4	18.3	0.2	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
%ile BackOfQ(50%),veh/ln	13.5	0.0	20.1				0.0	7.5	8.4	4.1	1.7	0.0
LnGrp Delay(d),s/veh	26.5	0.0	46.6				0.0	31.3	35.7	53.4	13.8	0.0
LnGrp LOS	C		D					C	D	D	B	
Approach Vol, veh/h		1335						1042			392	
Approach Delay, s/veh		37.1						32.8			28.7	
Approach LOS		D						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	12.9	27.2		39.9		40.1		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 8.3	21.9		34.9		34.9		
Max Q Clear Time (g_c+I1), s	8.5	16.7		34.7		5.3		
Green Ext Time (p_c), s	0.0	2.7		0.2		1.4		

Intersection Summary		
HCM 2010 Ctrl Delay		34.3
HCM 2010 LOS		C

Notes

LOS Engineering, Inc.

Intersection	
Intersection Delay, s/veh	29.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	337	5	7	4	2	113	5	308	6	94	171	201
Future Vol, veh/h	337	5	7	4	2	113	5	308	6	94	171	201
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	475	7	10	6	3	159	7	434	8	132	241	283
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	28.6	19.7	30.4	32.6
HCM LOS	D	C	D	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	93%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	94%	0%	3%	0%	100%	0%	0%	100%	22%
Vol Right, %	0%	0%	6%	0%	4%	0%	0%	100%	0%	0%	78%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	205	109	175	174	4	2	113	94	114	258
LT Vol	5	0	0	175	162	4	0	0	94	0	0
Through Vol	0	205	103	0	5	0	2	0	0	114	57
RT Vol	0	0	6	0	7	0	0	113	0	0	201
Lane Flow Rate	7	289	153	247	245	6	3	159	132	161	363
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.02	0.762	0.402	0.656	0.646	0.017	0.008	0.434	0.351	0.403	0.855
Departure Headway (Hd)	10.004	9.49	9.451	9.571	9.508	11.057	10.543	9.823	9.544	9.031	8.471
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	357	382	380	378	379	323	339	366	376	398	429
Service Time	7.779	7.265	7.225	7.338	7.275	8.846	8.332	7.612	7.31	6.797	6.236
HCM Lane V/C Ratio	0.02	0.757	0.403	0.653	0.646	0.019	0.009	0.434	0.351	0.405	0.846
HCM Control Delay	13	37.1	18.5	28.9	28.2	14	13.4	20	17.4	17.8	44.6
HCM Lane LOS	B	E	C	D	D	B	B	C	C	C	E
HCM 95th-tile Q	0.1	6.2	1.9	4.5	4.3	0.1	0	2.1	1.5	1.9	8.4

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↱		↑↑↑		↱
Traffic Vol, veh/h	447	271	0	0	0	165
Future Vol, veh/h	447	271	0	0	0	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	-	-	-	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	486	295	0	0	0	179

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	243
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	646
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	646
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	646	-	-	-
HCM Lane V/C Ratio	0.278	-	-	-
HCM Control Delay (s)	12.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	1.1	-	-	-

Intersection	
Int Delay, s/veh	35

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	132	468	12	96	860	16	109	7	49	20	8	42
Future Vol, veh/h	132	468	12	96	860	16	109	7	49	20	8	42
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	250	-	250	250	-	400	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	92	92	91	91	92	92	92	91	92	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	145	514	13	104	945	18	118	8	53	22	9	46

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	963	0	0	527	0	0	1395	1975	257	1653	1970	473
Stage 1	-	-	-	-	-	-	804	804	-	1153	1153	-
Stage 2	-	-	-	-	-	-	591	1171	-	500	817	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	408	-	-	658	-	-	149	61	632	104	62	460
Stage 1	-	-	-	-	-	-	272	394	-	156	270	-
Stage 2	-	-	-	-	-	-	420	265	-	476	388	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	408	-	-	658	-	-	~ 70	33	632	51	34	460
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 70	33	-	51	34	-
Stage 1	-	-	-	-	-	-	175	254	-	101	227	-
Stage 2	-	-	-	-	-	-	306	223	-	273	250	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4	1.1	$ 317.4	116.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	70	193	408	-	-	658	-	-	98
HCM Lane V/C Ratio	1.693	0.315	0.356	-	-	0.159	-	-	0.784
HCM Control Delay (s)	$ 464.1	32	18.6	-	-	11.5	-	-	116.9
HCM Lane LOS	F	D	C	-	-	B	-	-	F
HCM 95th %tile Q(veh)	10.4	1.3	1.6	-	-	0.6	-	-	4.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	172	282	19	602	70	117	351
Future Volume (veh/h)	172	282	19	602	70	117	351
Number	5	2		6	16	7	14
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00				1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1863	1863	1863
Adj Flow Rate, veh/h	193	317		676	79	131	394
Adj No. of Lanes	2	3		3	1	1	2
Peak Hour Factor	0.89	0.89		0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	295	1760		1057	329	897	1409
Arrive On Green	0.09	0.35		0.21	0.21	0.51	0.51
Sat Flow, veh/h	3442	5253		5253	1583	1774	2787
Grp Volume(v), veh/h	193	317		676	79	131	394
Grp Sat Flow(s),veh/h/ln	1721	1695		1695	1583	1774	1393
Q Serve(g_s), s	4.1	3.3		9.2	3.2	3.0	6.2
Cycle Q Clear(g_c), s	4.1	3.3		9.2	3.2	3.0	6.2
Prop In Lane	1.00				1.00	1.00	1.00
Lane Grp Cap(c), veh/h	295	1760		1057	329	897	1409
V/C Ratio(X)	0.65	0.18		0.64	0.24	0.15	0.28
Avail Cap(c_a), veh/h	994	3418		2303	717	897	1409
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	33.7	17.4		27.6	25.1	10.1	10.8
Incr Delay (d2), s/veh	2.5	0.0		0.6	0.4	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.6		4.4	1.4	1.5	6.3
LnGrp Delay(d),s/veh	36.2	17.4		28.2	25.5	10.4	11.3
LnGrp LOS	D	B		C	C	B	B
Approach Vol, veh/h		510		755		525	
Approach Delay, s/veh		24.5		27.9		11.1	
Approach LOS		C		C		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		33.7		42.5	10.5	23.1		
Change Period (Y+Rc), s		7.3		4.0	4.0	* 7.3		
Max Green Setting (Gmax), s		51.2		38.5	22.0	* 35		
Max Q Clear Time (g_c+I1), s		5.3		8.2	6.1	11.2		
Green Ext Time (p_c), s		2.0		1.9	0.5	4.6		

Intersection Summary	
HCM 2010 Ctrl Delay	22.0
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	404	5	0	608	29	0	0	5	0	0	113
Future Vol, veh/h	0	404	5	0	608	29	0	0	5	0	0	113
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	439	5	0	661	32	0	0	5	0	0	123

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	222	-	-	331
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	666	0	0	567
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	666	-	-	567
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.5	13.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	666	-	-	-	-	567
HCM Lane V/C Ratio	0.008	-	-	-	-	0.217
HCM Control Delay (s)	10.5	-	-	-	-	13.1
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	205	73	24	273	155	131	33	43	197	56	242
Future Volume (veh/h)	131	205	73	24	273	155	131	33	43	197	56	242
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	147	230	82	27	307	174	147	37	48	221	63	272
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	1022	313	77	805	246	183	276	358	255	780	1165
Arrive On Green	0.06	0.20	0.20	0.02	0.16	0.16	0.10	0.38	0.38	0.14	0.42	0.42
Sat Flow, veh/h	3442	5085	1557	3442	5085	1556	1774	732	949	1774	1863	2783
Grp Volume(v), veh/h	147	230	82	27	307	174	147	0	85	221	63	272
Grp Sat Flow(s),veh/h/ln	1721	1695	1557	1721	1695	1556	1774	0	1681	1774	1863	1391
Q Serve(g_s), s	3.5	3.2	3.7	0.6	4.5	8.8	6.8	0.0	2.8	10.2	1.7	5.3
Cycle Q Clear(g_c), s	3.5	3.2	3.7	0.6	4.5	8.8	6.8	0.0	2.8	10.2	1.7	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	224	1022	313	77	805	246	183	0	635	255	780	1165
V/C Ratio(X)	0.66	0.23	0.26	0.35	0.38	0.71	0.80	0.00	0.13	0.87	0.08	0.23
Avail Cap(c_a), veh/h	375	2499	765	186	2219	679	272	0	635	255	780	1165
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	27.9	28.1	40.2	31.5	33.3	36.6	0.0	17.0	34.9	14.6	15.6
Incr Delay (d2), s/veh	3.3	0.1	0.4	2.7	0.3	3.7	10.2	0.0	0.4	25.4	0.2	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	1.8	1.5	1.6	0.3	2.1	4.0	3.8	0.0	1.4	6.8	0.9	2.1
LnGrp Delay(d),s/veh	41.4	28.0	28.6	42.9	31.8	37.0	46.8	0.0	17.5	60.3	14.8	16.1
LnGrp LOS	D	C	C	D	C	D	D		B	E	B	B
Approach Vol, veh/h		459			508			232			556	
Approach Delay, s/veh		32.4			34.1			36.0			33.5	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	42.3	9.4	19.1	16.0	38.9	5.9	22.7
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	12.8	30.4	9.1	36.4	12.0	* 32	4.5	41.0
Max Q Clear Time (g_c+I1), s	8.8	7.3	5.5	10.8	12.2	4.8	2.6	5.7
Green Ext Time (p_c), s	0.1	1.3	0.1	2.4	0.0	0.4	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	33.7
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Appendix N

Existing with Project Intersection LOS Calculations with Mitigation and Concept Striping

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	21	0	64	276	832	0	0	261	492
Future Volume (veh/h)	0	0	0	21	0	64	276	832	0	0	261	492
Number				3	8	18	5	2	12	1	6	16
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		0.95
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				23	0	70	303	914	0	0	287	541
Adj No. of Lanes				0	1	1	1	3	0	0	1	2
Peak Hour Factor				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	0	0	2	2
Cap, veh/h				109	0	98	302	4106	0	0	1074	1730
Arrive On Green				0.06	0.00	0.06	0.17	0.81	0.00	0.00	0.58	0.58
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	1863	2999
Grp Volume(v), veh/h				23	0	70	303	914	0	0	287	541
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1863	1500
Q Serve(g_s), s				1.0	0.0	3.4	13.3	3.3	0.0	0.0	6.0	7.3
Cycle Q Clear(g_c), s				1.0	0.0	3.4	13.3	3.3	0.0	0.0	6.0	7.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				109	0	98	302	4106	0	0	1074	1730
V/C Ratio(X)				0.21	0.00	0.72	1.00	0.22	0.00	0.00	0.27	0.31
Avail Cap(c_a), veh/h				373	0	333	302	4106	0	0	1074	1730
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.65	0.65	0.00	0.00	0.93	0.93
Uniform Delay (d), s/veh				34.8	0.0	35.9	32.3	1.8	0.0	0.0	8.3	8.5
Incr Delay (d2), s/veh				0.9	0.0	9.4	42.2	0.1	0.0	0.0	0.6	0.4
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				0.5	0.0	1.7	10.0	1.6	0.0	0.0	3.2	3.1
LnGrp Delay(d),s/veh				35.7	0.0	45.3	74.5	1.8	0.0	0.0	8.8	9.0
LnGrp LOS				D		D	F	A			A	A
Approach Vol, veh/h					93			1217			828	
Approach Delay, s/veh					42.9			19.9			8.9	
Approach LOS					D			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		68.1			18.0	50.1		9.9
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		50.9			* 13	32.9		16.4
Max Q Clear Time (g_c+I1), s		5.3			15.3	9.3		5.4
Green Ext Time (p_c), s		7.0			0.0	4.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.7
HCM 2010 LOS	B

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	369	1	7	0	1	56	4	195	0	35	277	431
Future Volume (veh/h)	369	1	7	0	1	56	4	195	0	35	277	431
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.90	1.00		0.99	1.00		1.00	1.00		0.86
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	543	1	10	0	1	82	6	287	0	51	577	520
Adj No. of Lanes	1	1	0	2	1	1	1	3	0	1	1	1
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	678	59	586	203	826	698	11	1680	0	64	671	493
Arrive On Green	0.44	0.44	0.44	0.00	0.44	0.44	0.01	0.33	0.00	0.04	0.36	0.36
Sat Flow, veh/h	1302	132	1321	2712	1863	1573	1774	5253	0	1774	1863	1368
Grp Volume(v), veh/h	543	0	11	0	1	82	6	287	0	51	577	520
Grp Sat Flow(s),veh/h/ln	1302	0	1453	1356	1863	1573	1774	1695	0	1774	1863	1368
Q Serve(g_s), s	28.3	0.0	0.3	0.0	0.0	2.2	0.2	2.8	0.0	2.0	20.4	25.6
Cycle Q Clear(g_c), s	28.3	0.0	0.3	0.0	0.0	2.2	0.2	2.8	0.0	2.0	20.4	25.6
Prop In Lane	1.00		0.91	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	678	0	644	203	826	698	11	1680	0	64	671	493
V/C Ratio(X)	0.80	0.00	0.02	0.00	0.00	0.12	0.54	0.17	0.00	0.80	0.86	1.06
Avail Cap(c_a), veh/h	777	0	754	408	967	817	100	1680	0	162	671	493
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	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	0.0	11.1	0.0	11.0	11.6	35.2	16.9	0.0	34.0	21.1	22.7
Incr Delay (d2), s/veh	5.3	0.0	0.0	0.0	0.0	0.1	34.8	0.0	0.0	19.6	10.9	56.0
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	11.1	0.0	0.1	0.0	0.0	1.0	0.2	1.3	0.0	1.3	12.5	17.2
LnGrp Delay(d),s/veh	24.2	0.0	11.1	0.0	11.0	11.7	70.0	16.9	0.0	53.6	32.0	78.7
LnGrp LOS	C		B		B	B	E	B		D	C	F
Approach Vol, veh/h		554			83			293			1148	
Approach Delay, s/veh		23.9			11.7			18.0			54.1	
Approach LOS		C			B			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.1	28.0		36.0	4.9	30.1		36.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	6.5	23.1		36.9	4.0	25.6		36.9
Max Q Clear Time (g_c+I1), s	4.0	4.8		30.3	2.2	27.6		4.2
Green Ext Time (p_c), s	0.0	1.5		1.2	0.0	0.0		0.2

Intersection Summary		
HCM 2010 Ctrl Delay		39.3
HCM 2010 LOS		D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	723	5	38	253	1	61	4	28	35	3	72
Future Volume (veh/h)	74	723	5	38	253	1	61	4	28	35	3	72
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	81	795	5	41	278	1	66	4	30	38	3	79
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	0	1	0
Peak Hour Factor	0.91	0.91	0.92	0.92	0.91	0.91	0.92	0.92	0.92	0.91	0.92	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	106	1365	425	65	1247	388	182	19	146	67	5	140
Arrive On Green	0.06	0.27	0.27	0.04	0.25	0.25	0.10	0.10	0.10	0.13	0.13	0.13
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	190	1422	521	41	1083
Grp Volume(v), veh/h	81	795	5	41	278	1	66	0	34	120	0	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	0	1612	1646	0	0
Q Serve(g_s), s	1.7	5.3	0.1	0.9	1.7	0.0	1.3	0.0	0.8	2.7	0.0	0.0
Cycle Q Clear(g_c), s	1.7	5.3	0.1	0.9	1.7	0.0	1.3	0.0	0.8	2.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.88	0.32		0.66
Lane Grp Cap(c), veh/h	106	1365	425	65	1247	388	182	0	166	213	0	0
V/C Ratio(X)	0.76	0.58	0.01	0.63	0.22	0.00	0.36	0.00	0.21	0.56	0.00	0.00
Avail Cap(c_a), veh/h	182	2091	651	182	2091	651	729	0	663	677	0	0
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	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.0	12.3	10.4	18.5	11.7	11.1	16.3	0.0	16.0	15.9	0.0	0.0
Incr Delay (d2), s/veh	10.6	0.4	0.0	9.5	0.1	0.0	1.2	0.0	0.6	2.3	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	1.2	2.5	0.0	0.6	0.8	0.0	0.7	0.0	0.4	1.3	0.0	0.0
LnGrp Delay(d),s/veh	28.6	12.7	10.5	28.0	11.8	11.1	17.5	0.0	16.6	18.2	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	B		B	B		
Approach Vol, veh/h		881			320			100			120	
Approach Delay, s/veh		14.2			13.9			17.2			18.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.5	5.9	14.9		9.5	6.8	14.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		16.0	4.0	16.0		16.0	4.0	16.0
Max Q Clear Time (g_c+I1), s		3.3	2.9	7.3		4.7	3.7	3.7
Green Ext Time (p_c), s		0.2	0.0	3.2		0.4	0.0	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	36	0	98	458	844	0	0	242	716
Future Volume (veh/h)	0	0	0	36	0	98	458	844	0	0	242	716
Number				3	8	18	5	2	12	1	6	16
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		0.79
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				43	0	118	552	1017	0	0	292	863
Adj No. of Lanes				0	1	1	1	3	0	0	1	2
Peak Hour Factor				0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				171	0	152	592	4020	0	0	754	1016
Arrive On Green				0.10	0.00	0.10	0.33	0.79	0.00	0.00	0.40	0.40
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	1863	2509
Grp Volume(v), veh/h				43	0	118	552	1017	0	0	292	863
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1863	1255
Q Serve(g_s), s				2.0	0.0	6.6	27.1	4.7	0.0	0.0	10.0	28.1
Cycle Q Clear(g_c), s				2.0	0.0	6.6	27.1	4.7	0.0	0.0	10.0	28.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				171	0	152	592	4020	0	0	754	1016
V/C Ratio(X)				0.25	0.00	0.77	0.93	0.25	0.00	0.00	0.39	0.85
Avail Cap(c_a), veh/h				304	0	271	676	4020	0	0	754	1016
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.50	0.50	0.00	0.00	0.51	0.51
Uniform Delay (d), s/veh				37.7	0.0	39.7	29.0	2.5	0.0	0.0	18.9	24.3
Incr Delay (d2), s/veh				0.8	0.0	8.1	11.1	0.1	0.0	0.0	0.8	4.8
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				1.0	0.0	3.2	15.0	2.2	0.0	0.0	5.3	10.4
LnGrp Delay(d),s/veh				38.4	0.0	47.8	40.1	2.5	0.0	0.0	19.7	29.1
LnGrp LOS				D		D	D	A			B	C
Approach Vol, veh/h					161			1569			1155	
Approach Delay, s/veh					45.3			15.8			26.7	
Approach LOS					D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		76.2			34.7	41.5		13.8
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		64.4			* 34	25.4		15.4
Max Q Clear Time (g_c+I1), s		6.7			29.1	30.1		8.6
Green Ext Time (p_c), s		8.2			0.9	0.0		0.3

Intersection Summary		
HCM 2010 Ctrl Delay		21.8
HCM 2010 LOS		C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	337	5	7	4	2	113	5	308	6	94	171	201
Future Volume (veh/h)	337	5	7	4	2	113	5	308	6	94	171	201
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.83	1.00		0.72	1.00		0.67
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	475	7	10	6	3	159	7	434	8	132	241	283
Adj No. of Lanes	1	1	0	2	1	1	1	3	0	1	2	0
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	522	320	457	21	359	254	13	1004	18	165	501	302
Arrive On Green	0.29	0.48	0.48	0.01	0.19	0.19	0.01	0.20	0.20	0.09	0.28	0.28
Sat Flow, veh/h	1774	665	950	3442	1863	1318	1774	5102	93	1774	1770	1066
Grp Volume(v), veh/h	475	0	17	6	3	159	7	287	155	132	241	283
Grp Sat Flow(s),veh/h/ln	1774	0	1614	1721	1863	1318	1774	1695	1805	1774	1770	1066
Q Serve(g_s), s	20.8	0.0	0.4	0.1	0.1	8.9	0.3	6.0	6.1	5.9	9.1	20.9
Cycle Q Clear(g_c), s	20.8	0.0	0.4	0.1	0.1	8.9	0.3	6.0	6.1	5.9	9.1	20.9
Prop In Lane	1.00		0.59	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	522	0	776	21	359	254	13	667	355	165	501	302
V/C Ratio(X)	0.91	0.00	0.02	0.28	0.01	0.63	0.55	0.43	0.44	0.80	0.48	0.94
Avail Cap(c_a), veh/h	648	0	830	171	369	261	88	701	373	215	501	302
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	0.00	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	27.5	0.0	11.0	39.9	26.3	29.9	39.9	28.4	28.5	35.9	24.0	28.3
Incr Delay (d2), s/veh	14.9	0.0	0.0	6.9	0.0	4.5	31.9	0.4	0.8	14.6	0.7	35.9
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	12.3	0.0	0.2	0.1	0.1	3.5	0.3	2.8	3.1	3.6	4.5	9.1
LnGrp Delay(d),s/veh	42.4	0.0	11.0	46.8	26.3	34.3	71.9	28.9	29.3	50.4	24.7	64.1
LnGrp LOS	D		B	D	C	C	E	C	C	D	C	E
Approach Vol, veh/h		492			168			449			656	
Approach Delay, s/veh		41.3			34.6			29.7			46.9	
Approach LOS		D			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	20.4	5.0	43.3	5.1	27.3	28.2	20.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.8	16.7	4.0	41.5	4.0	22.5	29.5	16.0
Max Q Clear Time (g_c+I1), s	7.9	8.1	2.1	2.4	2.3	22.9	22.8	10.9
Green Ext Time (p_c), s	0.1	1.6	0.0	0.1	0.0	0.0	0.9	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	39.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	468	12	96	860	16	109	7	49	20	8	42
Future Volume (veh/h)	132	468	12	96	860	16	109	7	49	20	8	42
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	145	514	13	104	945	18	118	8	53	22	9	46
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	0	1	0
Peak Hour Factor	0.91	0.91	0.92	0.92	0.91	0.91	0.92	0.92	0.92	0.91	0.92	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	186	1593	496	133	1441	439	208	25	165	44	18	93
Arrive On Green	0.10	0.31	0.31	0.07	0.28	0.28	0.12	0.12	0.12	0.09	0.09	0.09
Sat Flow, veh/h	1774	5085	1583	1774	5085	1550	1774	212	1403	475	194	994
Grp Volume(v), veh/h	145	514	13	104	945	18	118	0	61	77	0	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1550	1774	0	1615	1664	0	0
Q Serve(g_s), s	3.6	3.5	0.3	2.6	7.3	0.4	2.8	0.0	1.6	2.0	0.0	0.0
Cycle Q Clear(g_c), s	3.6	3.5	0.3	2.6	7.3	0.4	2.8	0.0	1.6	2.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.87	0.29		0.60
Lane Grp Cap(c), veh/h	186	1593	496	133	1441	439	208	0	189	155	0	0
V/C Ratio(X)	0.78	0.32	0.03	0.78	0.66	0.04	0.57	0.00	0.32	0.50	0.00	0.00
Avail Cap(c_a), veh/h	297	1916	596	281	1870	570	672	0	612	593	0	0
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	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.6	11.8	10.7	20.4	14.2	11.7	18.7	0.0	18.2	19.3	0.0	0.0
Incr Delay (d2), s/veh	6.9	0.1	0.0	9.6	0.5	0.0	2.4	0.0	1.0	2.5	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	2.1	1.6	0.1	1.6	3.5	0.2	1.5	0.0	0.7	1.0	0.0	0.0
LnGrp Delay(d),s/veh	26.4	11.9	10.7	29.9	14.7	11.7	21.1	0.0	19.1	21.8	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	C		B	C		
Approach Vol, veh/h		672			1067			179			77	
Approach Delay, s/veh		15.0			16.1			20.5			21.8	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.8	7.9	18.6		8.7	9.2	17.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		17.0	7.1	16.9		16.0	7.5	16.5
Max Q Clear Time (g_c+I1), s		4.8	4.6	5.5		4.0	5.6	9.3
Green Ext Time (p_c), s		0.4	0.0	2.4		0.2	0.1	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B


CALTRANS SR-905 ONRAMP
±400'
CALIENTE AVE.

Appendix O

Caliente Ave/Airway Rd Signal Warrant Calculations

AIRWAY @ CALIENTE.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume — **SATISFIED*** YES ☐ NO ☒

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	7AM	8AM	4PM	5PM
Both Approaches - Major Street		✓	358	934	774	351
Higher Approach - Minor Street		✓	232	373	338	176

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐	No ☒
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐	No ☒

WARRANT 3 - Peak Hour — **SATISFIED** YES ☒ NO ☐
(Part A or Part B must be satisfied)

PART A ✓ — **SATISFIED** YES ☒ NO ☐
(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☒	No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☒	No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☒	No ☐

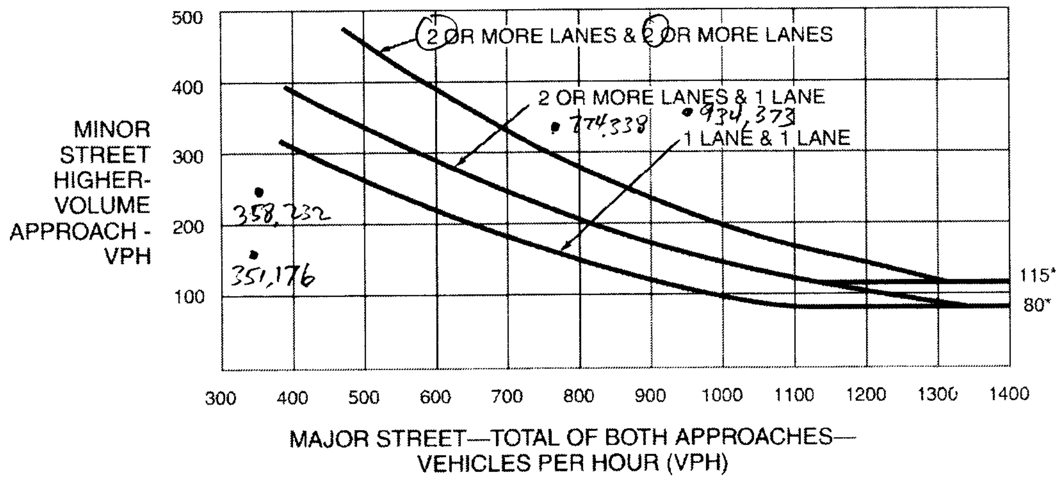
PART B — **SATISFIED** YES ☐ NO ☐

APPROACH LANES	One	2 or More	Hour
Both Approaches - Major Street			
Higher Approach - Minor Street			

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐	No ☐
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐	No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

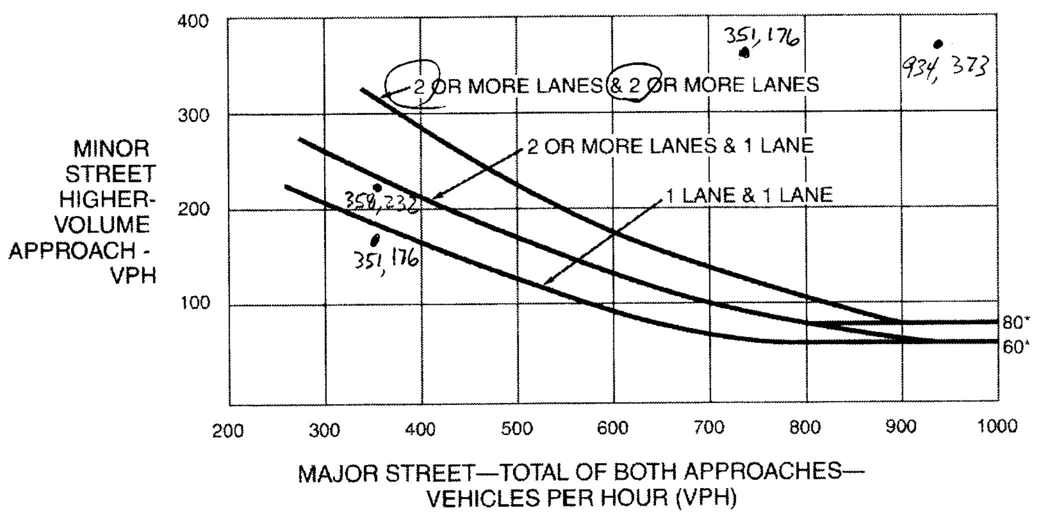
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

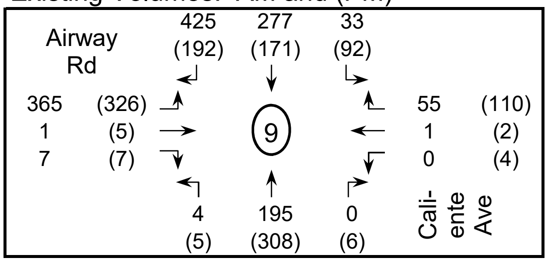
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Warrant 3

Existing Volumes: AM and (PM)



Warrant 3 Part A1
AM LOS existing delay = 124.8 second/vehicle

AM vehicles one minor street apparoch =	373	Vehicles
AM delay one street approach = 373 veh x 124.8 sec/veh =	46,550	Seconds of delay
AM delay one street approach (hours) =	12.9	Hours of delay

Warrant 3 Part A2

AM vehicles one minor street apparoch =	373	Vehicles

Warrant 3 Part A3

Total AM entering vehicles =	1,363	Vehicles

Intersection	
Intersection Delay, s/veh	124.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	365	1	7	0	1	55	4	195	0	33	277	425
Future Vol, veh/h	365	1	7	0	1	55	4	195	0	33	277	425
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	537	1	10	0	1	81	6	287	0	49	407	625
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	29.4	15.3	16.2	210.9
HCM LOS	D	C	C	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	96%	0%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	100%	0%	1%	100%	100%	0%	0%	100%	18%
Vol Right, %	0%	0%	0%	0%	4%	0%	0%	100%	0%	0%	82%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	98	98	186	187	0	1	55	33	185	517
LT Vol	4	0	0	186	179	0	0	0	33	0	0
Through Vol	0	98	98	0	1	0	1	0	0	185	92
RT Vol	0	0	0	0	7	0	0	55	0	0	425
Lane Flow Rate	6	143	143	274	275	0	1	81	49	272	761
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.016	0.365	0.296	0.67	0.669	0	0.004	0.206	0.116	0.609	1.581
Departure Headway (Hd)	10.512	9.992	8.189	9.5	9.452	10.735	10.735	10.016	8.588	8.074	7.483
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	343	363	442	383	385	0	335	361	418	448	487
Service Time	8.212	7.692	5.889	7.2	7.152	8.435	8.435	7.716	6.331	5.816	5.225
HCM Lane V/C Ratio	0.017	0.394	0.324	0.715	0.714	0	0.003	0.224	0.117	0.607	1.563
HCM Control Delay	13.4	18.3	14.3	29.5	29.3	13.4	13.5	15.3	12.5	22.7	290.8
HCM Lane LOS	B	C	B	D	D	N	B	C	B	C	F
HCM 95th-tile Q	0	1.6	1.2	4.7	4.7	0	0	0.8	0.4	4	41.6

Warrant 2 data

Location: San Diego
N/S: Caliente Avenue
E/W: Airway Road

Date: 1/18/18
Day: THURSDAY
Project # 143-18041

TURNING MOVEMENT COUNT

Count Period: **7:00 AM to 9:00 AM**
Peak Hour: **8:00AM to 9:00 AM**

Vehicle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			Airway Road Eastbound			Airway Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	2	0	14	5	18	38	0	1	0	0	18	96
7:15 AM	0	2	1	4	7	26	46	1	0	0	1	19	107
7:30 AM	1	10	0	6	15	46	60	0	1	0	0	23	162
7:45 AM	2	33	1	13	55	97	81	2	2	2	0	14	302
8:00 AM	1	31	0	11	42	71	68	0	1	0	0	18	243
8:15 AM	0	32	0	7	46	71	65	0	2	0	0	12	235
8:30 AM	0	41	0	5	71	140	112	0	2	0	1	13	385
8:45 AM	3	91	0	10	118	143	120	1	2	0	0	12	500
TOTAL VOLUMES:	7	242	2	70	359	612	590	4	11	2	2	129	2030

			Eastbound	Westbound
Major St (both approaches) 7-8am	**358**	Minor Street 7-8am	**232**	77
Major St (both approaches) 8-9am	**934**	Minor Street 8-9am	**373**	56

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:00 PM to 5:00 PM**

Vehicle Counts

	Caliente Avenue Northbound			Caliente Avenue Southbound			Airway Road Eastbound			Airway Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	89	4	41	90	60	65	2	2	2	1	51	407
4:15 PM	3	158	2	21	55	39	115	2	3	1	1	34	434
4:30 PM	2	44	0	14	14	44	99	1	1	0	0	7	226
4:45 PM	0	17	0	16	12	49	47	0	1	1	0	18	161
5:00 PM	1	11	1	23	5	42	44	0	0	0	0	13	140
5:15 PM	2	9	0	16	7	43	39	1	1	0	0	5	123
5:30 PM	0	4	0	18	1	57	31	1	0	1	1	8	122
5:45 PM	0	6	0	25	4	76	58	0	1	0	1	10	181
TOTAL VOLUMES:	8	338	7	174	188	410	498	7	9	5	4	146	1794

			Eastbound	Westbound
Major St (both approaches) 4-5pm	**774**	Minor Street 4-5pm	**338**	116
Major St (both approaches) 5-6pm	**351**	Minor Street 5-6pm	**176**	39

Appendix P

Otay CPU FEIR, PFFP, Candlelight MMRP, Southview MMRP, and Greenfield DIA

Final
Program Environmental Impact Report for the Otay Mesa Community Plan Update, City of San Diego

Project Number 30330/304032

SCH No. 2004651076

December 18, 2013

5.12 Transportation/Circulation

This section analyzes the potential transportation-related impacts associated with the adoption of the CPU. The study area boundaries for the purposes of the traffic analysis include the CPU area and extend to those areas outside the CPU area to roads that are common to other communities in the City of San Diego and other jurisdictions such as the City of Chula Vista and the County of San Diego. The analysis in this section is based on the Traffic Impact Analysis (TIA) prepared by Urban Systems Associates (USA), Inc. (June 14, 2012), which is contained in Appendix J.

Traffic analysis was conducted in support of the CPU in order to identify the recommended roadway classifications and other recommended transportation improvements to support buildout of the CPU land uses and proposed zoning, and to identify any significant traffic impacts that would remain unmitigated at the programmatic level.

Future traffic volumes were forecasted using SANDAG's Series 11 regional transportation model calibrated for the Otay Mesa area. Land uses within the CPU area were assumed to be built out within the traffic model. The CPU transportation model network included the future improvements from the Adopted Community Plan that were assumed to be completed at buildout of the CPU and included the Year 2030 Regional Transportation Plan "Reasonably Expected" projects in the region such as SR-11 and the SR-905/SR-125/SR-11 freeway interchange. Also, the model was modified to include a half-diamond interchange (instead of a full interchange) at SR-125/Lone Star Road and a portion of SR-125 was modeled as a toll facility.

Due to the undeveloped nature of much of the community, a majority of the circulation element roadways are not built, are only partially built, or are not operating near capacity. Therefore, for many facilities, an analysis of the CPU buildout traffic volumes on the existing transportation network was not possible or meaningful. So, although the existing condition is considered the baseline for identifying significant impacts, in order to identify the recommended roadway classifications and other transportation improvements, the proposed CPU land use buildout traffic volumes were initially analyzed on the CPU transportation network. Based on those level of service analysis results and other considerations, where possible, recommendations were made for the CPU roadway classifications, intersection lane configurations, and freeway and ramp improvements that would mitigate or reduce impacts by bringing the facilities to Level of Service D or better operation at buildout.

All but 24 potential roadway segment significant impacts would be mitigated at the programmatic level by incorporating the recommended roadway segment classifications (refer to Table 5.12-4 CPU Classification column) in the CPU Figure 3-2 Otay Mesa Roadway Classification Map and Public Facilities Financing Plan, and through future development project review and implementation (ministerial and discretionary review through the CPIOZ). Further mitigation at the programmatic level is not recommended at the remaining 24 roadway segments due to various factors such as adjacency to environmentally sensitive land and/or steep slopes, existing development conflicts, and/or multi-modal and urban design context. At the project-level, partial mitigation may be possible in the form of transportation demand management (TDM) measures that encourage carpooling and alternate means of transportation. At the time future discretionary development projects are proposed, project-specific traffic analyses would contain detailed recommendations.

All but 39 intersection significant impacts would be mitigated at the programmatic level by incorporating the intersection configurations (refer to Figures 5.12-4a. – 5.12-4g.) for the 53 intersections analyzed into the projects to be funded through the Public Facilities Financing Plan and through future development projects (ministerial and discretionary through the CPIOZ). Further mitigation at the programmatic level is not recommended at the 39 intersections that would continue to be significantly impacted after mitigation due to considerations such as adjacency to environmentally sensitive land, steep slopes, routes to schools, and multi-modal and urban design context, or because additional study would be required in order to make additional recommendations. At the project-level, partial mitigation may be possible in the form of TDM measures that encourage carpooling and alternate means of transportation. At the time future discretionary development projects are proposed, project-specific traffic analyses would contain detailed recommendations.

Five freeway segments on SR- 905 would be significantly impacted by buildout of the CPU. Mitigation in the form of one HOV lane in each direction on SR- 905 would reduce impacts on all five segments, with three segments continuing to be significantly impacted. However, since funding for the HOV lanes is not programmed at this time and is not included in the PFFP, five freeway segment impacts would remain significant and unmitigated at the programmatic level. At the project- level, partial mitigation may be possible in the form of TDM measures that encourage carpooling and alternate means of transportation, or other improvements such as auxiliary lanes that would require further study. At the time future discretionary development projects are proposed, project-specific traffic analyses would contain detailed recommendations.

Five ramp meters locations on SR- 905 would be significantly impacted by the CPU. At the project- level, partial mitigation may be possible in the form of TDM measures that encourage carpooling and alternate means of transportation or other improvements such as auxiliary lanes or adding a lane to the freeway onramp, that would require further study. At the time future discretionary development projects are proposed, project-specific traffic analyses would contain detailed recommendations.

5.12.1 Existing Conditions

The following section outlines traffic conditions and regulatory framework of the existing street network, including roadway segments, key intersections, freeway segments, mass transit routes, bikeways, and pedestrian facilities within the study area.

5.12.1.1 Regulatory Framework

Traffic conditions and transportation planning in San Diego County are guided by state, regional, and local agencies and their policies. Caltrans is responsible for enhancement and maintenance of state highways and interstate freeways. Any changes to state facilities or construction within state right-of-way require an encroachment permit from Caltrans. Regional transportation planning efforts are guided by the travel forecasting models run by SANDAG. Locally, each incorporated city, including the City of San Diego, along with the County of San Diego, has developed specific goals and policies for traffic conditions and roadways within their jurisdiction. Each agency is responsible for the implementation of its goals and policies.

a. City of San Diego General Plan

The Mobility Element of the City of San Diego General Plan defines the policies regarding traffic flow and transportation facility design. The purpose of the Mobility Element is “to improve mobility through development of a balanced, multi-modal transportation network.” The main goals of the Mobility Element pertain to walkable communities, transit first, street and freeway system, intelligent transportation systems, (ITS), Transportation Demand Management (TDM), bicycling, parking management, airports, passenger rail, goods movement/freight, and regional transportation coordination and financing.

b. Otay Mesa Community Plan Transportation Element

The purpose of the adopted Otay Mesa Community Plan Transportation Element is to establish goals and policies to guide future street network and design, street classification, LOS, transit facilities and service, pedestrian and bicycle accommodations, and facility improvements needed to support future travel needs within the Community Plan area. This element would be replaced by the proposed Mobility Element of the CPU if adopted.

c. Regional Transportation Plan

SANDAG’s 2050 RTP, adopted in October 2011, is the long-range mobility plan for the region. It includes short-term and long-term strategies for the development of an integrated multi-modal transportation system, and is required in order to be eligible for state and federal funding. The RTP identifies and prioritizes projects, and calls out funding sources for their implementation. The 2050 RTP is developed around five primary components: a Sustainable Communities Strategy, Social Equity and Environmental Justice, Systems Development, Systems Management, and Demand Management. It addresses improvements to transit, rail, roadways, goods movement, bicycling, and walking, as well as other topics. The RTP Sustainable Communities Strategy (SCS), consistent with Senate Bill 375, shows how integrated land use, housing, and transportation planning can lead to lower greenhouse gas emissions from autos and light trucks. The RTP is intended to support a regional smart growth plan. This vision reflects a transportation system that supports a robust economy and a healthy and safe environment with climate change protection while providing a higher quality of life for San Diego County residents. This includes better activity centers with homes and jobs enabling more people to use transit and walk and bike; efficiently transporting goods; and providing effective transportation options for all people. It should be noted that the PEIR prepared for the RTP and SCS is the subject of ongoing litigation (as of printing of this PEIR).

d. Bicycle Master Plan

The City's Bicycle Master Plan (City of San Diego 2002) seeks to foster a bicycle-friendly environment to serve commuter and recreational riders. The plan is currently undergoing an update and identifies policies, routes, programs, and facility priorities to increase bicycle transportation, safety, access, and quality of life. Similar to improved pedestrian environments and routes, improved bicycle routes can increase ridership, which provides community and regional benefits (reduced traffic congestion, energy consumption, vehicle emissions, etc.). The development, maintenance, and support of a bicycle network addressed in the Bicycle Master Plan were considered in the Mobility Element of the General Plan (City of San Diego 2008).

e. Level of Service Criteria

The Level of Service (LOS) criteria used in this analysis is based on the City of San Diego Traffic Impact Study Manual (1998). LOS provides a quantitative measure of certain traffic criteria (speed, travel time, comfort, etc.) that represent a transportation facility quality of service from a traveler's perspective. A vehicle level of service definition generally describes these conditions in terms of such factors as speed, travel time, freedom to maneuver, comfort, convenience, and safety. LOS A represents the best operating conditions from a driver's perspective (primarily free-flow operation), while LOS F represents the worst case where traffic flow is at extremely low speed. Per the City criteria, intersections and roadway segments operating at a LOS D or better are considered acceptable under both direct and cumulative conditions. LOS criteria for roadway segments, intersection, and freeways are discussed below.

Roadway Segments

The roadway level of service standards and thresholds that the City of San Diego uses provide the basis for analyzing arterial roadway segment performance. The analysis of roadway segment level of service is based on the functional classification of the roadway, the maximum desirable capacity, roadway geometrics, and existing or forecasted average daily traffic (ADT) volumes. The actual capacity of roadway facilities can vary due to a number of actual characteristics including, but not limited to, pavement width, frequency of cross streets and driveways, intersection signal timing, geometry, and on-street parking. The actual functional capacity is typically based on the ability of arterial intersections to accommodate peak hour volumes. LOS D is considered acceptable for roadway segments.

Intersections

Intersection analysis, per the Highway Capacity Manual (HCM; Transportation Research Board 2010), varies for signalized intersections and unsignalized intersections. The intersection analysis considers lane width, on-street parking, conflicting pedestrian flow, traffic composition (i.e., percent of trucks) and shared lane movements (e.g., through and right-turn movements from the same lane). LOS for signalized intersections is based on the average control delay per vehicle for the peak 15-minute period within the hour analyzed. The average control delay includes initial deceleration delay, queue move-up time, and final acceleration time in addition to the stop delay. The LOS for unsignalized intersections is determined by the computed or measured control delay and is defined for each minor movement. At an all-way stop controlled intersection, the delay reported is the average control delay of the intersection. At a one-way or two-way stop controlled intersection, the delay reported represents the worst movement, typically the left runs from the minor street approach. The threshold of LOS D, a delay of 55 seconds per vehicle is considered acceptable for signalized intersections and a delay of 35 seconds per vehicle at LOS D is considered acceptable for unsignalized intersections.

Freeway Segments

Freeway segments are analyzed using standard Caltrans methodologies. The procedures for determining freeway LOS involve calculating a peak hour volume to capacity ratio (V/C). Peak hour volumes are estimated from the application of design hour (“K”), directional (“D”) and truck (“T”) factors to ADT volumes. The truck factors (percent trucks) are obtained from historic Caltrans data, local truck counts, and projections of future volumes at the border crossings. The resulting V/C ratio is then compared with accepted ranges of V/C values corresponding to the various LOS. The corresponding LOS represents an approximation of existing or forecasted freeway operating conditions during the peak hour. Caltrans has developed four levels of freeway congestion within LOS F, ranging from F(0) (considered congestion) to F(3) (gridlock).

Any facility operating at LOS E (0.93 to 1.00 V/C) or F (over 1.01 V/C) is considered an unacceptable LOS.

Freeway Ramp Metering

Freeway ramp meters are considered to operate acceptably if the vehicle delay is less than 15 minutes. If the vehicle delay exceeds 15 minutes at a freeway on-ramp meter and the downstream freeway is operating at LOS E or F, the delay is considered unacceptable.

5.12.1.2 Existing Circulation System

Much of the land in the CPU area is undeveloped. Only the developed residential areas on the western side of the CPU area have consistently improved roads created through a comprehensive funding and phasing system. Roads in the rest of the CPU area have been improved incrementally as property frontages have developed. Therefore, much of the street system is unconnected and incomplete.

I-805 and SR-125 provide regional north-south access to Otay Mesa. SR-125, known as the South Bay Expressway, provides an extension of SR-125 from SR-54 in Spring Valley to SR-905. The South Bay Expressway is operated as a toll road by SANDAG.

SR-905, Otay Mesa Road, and Palm Avenue provide east-west connections from the CPU area to I-805. SR-905 provides connection from the Otay Mesa POE and CPU area surface streets with regional freeway I-805. At the time of the existing conditions analysis, a 4.5-mile portion of SR-905 was a conventional highway (Otay Mesa Road). The SR-905 freeway was recently completed within the CPU area and was opened to traffic in July 2012. The existing conditions analysis is based on data collected before the SR-905 freeway was opened to traffic from Britannia Boulevard to the international border.

a. Key Freeways and Roadways

The following are general descriptions of key roadways within the community divided into three categories: roads that provide access to and from the community, roads within residential areas, and roads within industrial areas. Also, the major truck routes utilized to transport goods are listed below.

Community Access Freeways and Roads[1]

I-805 – is a north-south freeway that starts from approximately three-quarters of a mile north of the U.S.-Mexico border, extends through San Diego, Chula Vista, National City, and connects to I-5 in Sorrento Valley. This freeway is located to the west of the CPU area and contains ramps to SR-905. Near the CPU area, this freeway is four lanes at its southern origination point to eight lanes further north.

SR-905 – a six-lane freeway that extends into Otay Mesa for a mile from its interchange with I-805 and transitions into Otay Mesa Road, a six-lane Primary Arterial for approximately 4.5 miles where it connects to another one-mile freeway portion that ends at the Port of Entry.

SR-125 – is a north-south freeway located to the east of the CPU area extending from Otay Mesa Road at approximately 1.25 miles north of the U.S.-Mexico border north to SR-52. It provides a connection between Otay Mesa, Chula Vista, Spring Valley, Lemon Grove, La Mesa, San Diego, and Santee. The southern segment between Otay Mesa Road and SR-54 is a four-lane toll road called the South Bay Expressway.

Old Otay Mesa Road – a two-lane Collector (without left-turn lane) connecting Otay Mesa with San Ysidro. It extends along the rim of a canyon and intersects with SR-905/Otay Mesa Road.

Del Sol Boulevard – a four-lane Collector (with left-turn lane) as it crosses under I-805 from Otay Mesa-Nestor. It intersects Dennery Road and then continues for approximately a quarter-mile as a two-lane Collector (with left-turn lane).

Palm Avenue – crosses over I-805 from Otay Mesa-Nestor on a four-lane bridge with double left-turn-lanes at the interchange of Palm Avenue and I-805. Palm Avenue transitions to a six-lane Primary Arterial, and intersects with Dennery Road.

Otay Valley Road – a six-lane major road, Main Street, at I-805 in the City of Chula Vista. Otay Valley Road crosses the Otay River on a two-lane bridge with a center turn lane and continues as a two-lane Collector (without left-turn lane) into the City of San Diego.

Otay Mesa Road – from the terminus of SR-905, Otay Mesa Road is constructed as a six-lane Primary Arterial to Otay Center Road. It is constructed as a seven-lane Major

[1]Note that this section describes the existing conditions assumed in the traffic impact analysis (Appendix J). Additional improvements may currently be in place, such as the SR-905 freeway improvements.

Arterial between Otay Center Road and La Media Road. It transitions to a four-lane Major Arterial east of La Media Road and intersects with the SR-125 southbound off-ramp and northbound on-ramp, and continues east into County of San Diego lands.

Otay Mesa Border Crossing and Port of Entry – a second border crossing between the U.S. and Mexico located at the southeast corner of Otay Mesa. This POE allows automobiles but is primarily used for truck traffic, which is predominant throughout the community of Otay Mesa.

Roads within Residential Areas

Dennery Road – is constructed as a four-lane Major Arterial between Del Sol Boulevard and Palm Avenue. North of Palm Avenue, the road transitions to a four-lane Collector (with left-turn lane) and eventually transitions to a two-lane Collector (without fronting property).

Ocean View Hills Parkway – is a four-lane Major Arterial road extending from Dennery Road to Del Sol Boulevard. South of Del Sol Boulevard this roadway is constructed as a six-lane Major Arterial and intersects with conventional highway SR-905/Otay Mesa Road.

Avenida de las Vistas – is a two-lane Collector (without fronting property) extending west of Otay Valley Road. The residential development along Avenida de las Vistas can be accessed via Otay Valley Road to the north or Otay Mesa Road from the south.

Caliente Avenue – is a partially built four-lane Major Arterial extending south from Otay Mesa Road, intersecting with Airway Road. This segment will be constructed as six lanes as part of the SR-905 interchange currently under construction at this location.

Beyer Boulevard – is a four-lane Major Arterial extending from Old Otay Mesa Road westerly into the San Ysidro Community Plan area, and provides access to the nearby Beyer Boulevard transit station.

Roads Within Industrial Areas

Airway Road – is an east-west, partially built roadway varying in width that runs parallel with Otay Mesa Road from Britannia Boulevard to the County boundary. The western segment of Airway Road is a three-lane Collector (2 lanes eastbound, 1 lane westbound) between Old Otay Mesa Road and Caliente Avenue, and provides access to San Ysidro High School.

Siempre Viva Road – is an east-west, partially built roadway varying in width between Cactus Road and La Media Road. East of La Media Road, Siempre Viva Road is a six-lane Primary Arterial with an interchange at SR-905 and then transitions to a four-lane Major Arterial from Paseo de las Americas to the County boundary.

Heritage Road – is a north-south, partially built roadway varying in width from Otay Valley Road to its terminus south of Gateway Park Drive.

Cactus Road – is a north-south, four-lane Collector (with left-turn lane) south of Otay Mesa Road, ending at the SR-905 right-of-way. South of SR-905 it is partially constructed with two lanes.

Britannia Boulevard – is a north-south, partially built Major Arterial roadway extending between Otay Mesa Road and Siempre Viva Road. The SR-905 interchange is under construction between Otay Mesa Road and Airway Road. South of Airway Road, portions are built as a four-lane Major Arterial, while some segments are only constructed to half-width.

La Media Road – is a north-south, partially built Major Arterial extending from north of Otay Mesa Road to Siempre Viva Road. The SR-905 interchange is under construction between Otay Mesa Road and Airway Road. South of Airway Road only two lanes are built, extending to a truck only road extending to the east Otay Mesa inspection facility. This road is currently the designated southbound truck route for laden (carrying cargo) trucks from conventional highway SR-905/Otay Mesa Road to the east Otay Mesa inspection facility.

Truck Routes

Truck routes within the CPU area are an important component of the circulation system. The Otay Mesa POE provides a major commercial truck transport point between the U.S. and Mexico. From the POE, trucks travel to the warehouses/distribution facilities within the CPU area and to major freeways for further distribution. Currently, the major truck routes utilized to transport goods include SR-905, SR-125, La Media Road, Siempre Viva Road, Britannia Boulevard, and Otay Mesa Road. These roads are described above. Drucker Lane is a minor roadway utilized as a truck route connection between Siempre Viva Road and La Media Road. This roadway is five lanes at the intersection of Siempre Viva Road, and four lanes from just south of that intersection to Kern Street, and is reduced down to one southbound lane between Kern Street and La Media Road. Truck traffic heading to Mexico through the Otay Mesa POE typically queue on Drucker Lane and La Media Road.

b. Key Intersections

There are 15 key intersections within the study area under the existing conditions, which are as follows:

1. Palm Avenue/I-805 SB Ramps
2. Palm Avenue/I-805 NB Ramps
3. Palm Avenue/Dennery Road

4. Otay Mesa Road/Caliente Avenue
5. Otay Mesa Road/Corporate Center Drive
6. Otay Mesa Road/Heritage Road
7. Otay Mesa Road/Cactus Road
8. Otay Mesa Road/Britannia Boulevard
9. Otay Mesa Road/La Media Road
10. Otay Mesa Road/Piper Ranch Road
11. Otay Mesa Road/SR-125 SB Off-ramp
12. Otay Mesa Road/SR-125 NB On-ramp

13A. Siempre Viva Road/SR-905 SB Ramps
13B. SR-905 SB Off-ramp to WB Siempre Viva Road (unsignalized)
14. Siempre Viva Road /SR-905 NB Ramps

All of these intersections are currently signalized with the exception of 13B.

5.12.1.3 Existing Traffic Volumes

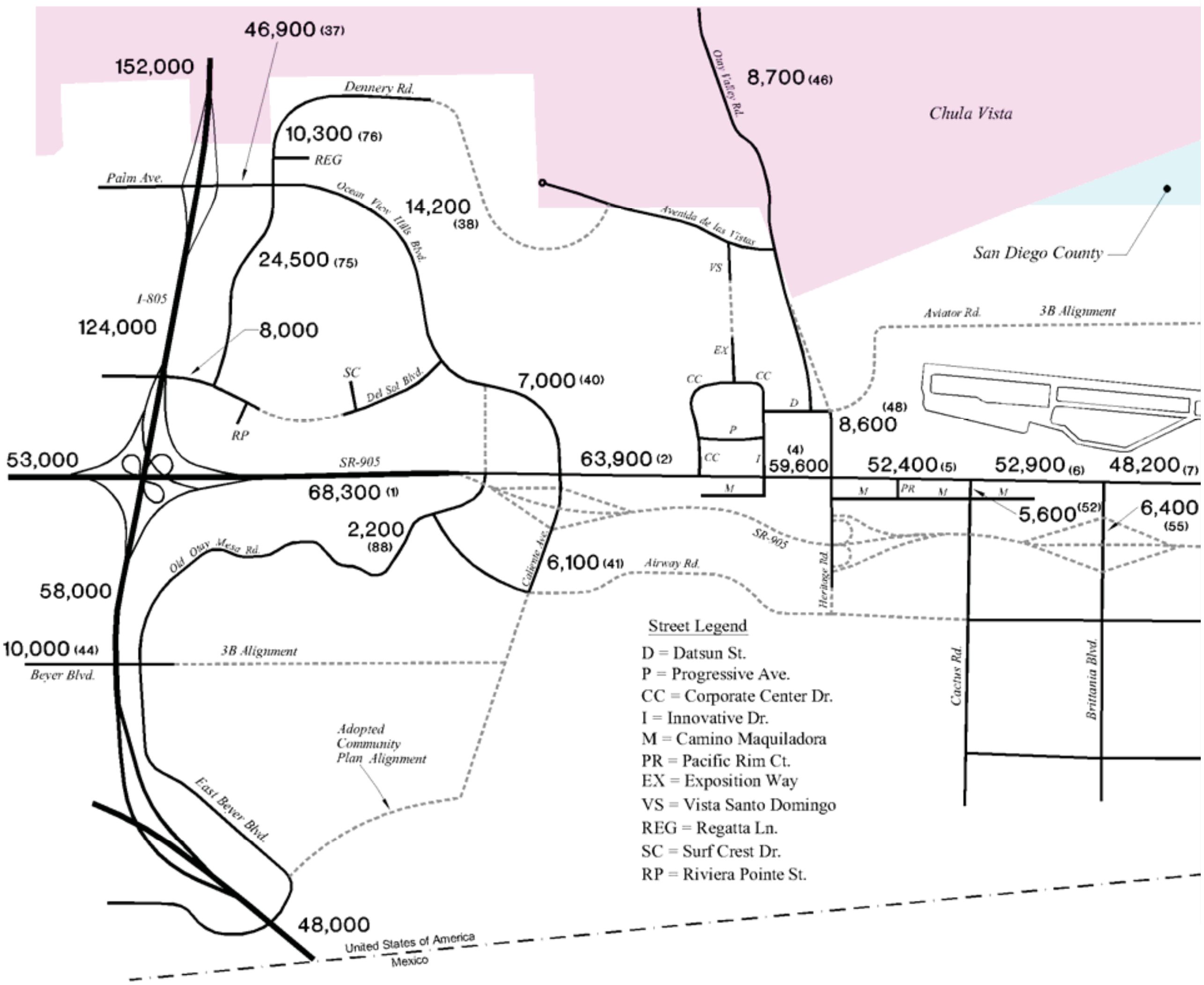
Existing traffic volumes are based on recent traffic counts (2005 to 2010) conducted by Caltrans, the City of San Diego, or recently counted for other project study purposes. It is noted that traffic volumes were obtained before the opening of SR-905 Phase 1-A improvements from the partial Britannia Boulevard interchange to east of the La Media Road partial interchange. Due to the high number of trucks utilizing CPU area roadways compared to typical San Diego communities, the truck percentage of vehicular traffic assumed in the analysis summarized below was increased from the typical 2 percent to 10 percent.

a. Roadway Segments

The existing ADT volumes for road segments within the CPU area are shown in Figures 5.12-1a and 5.12-1b. Table 5.12-1 shows existing street segment LOS based on the City of San Diego Traffic Impact Manual. As shown, all roadway segments except the following seven operate at an acceptable LOS D or better:

1. Otay Mesa Road from SR-905 to Caliente Avenue (LOS F)
2. Otay Mesa Road from Caliente Avenue to Corporate Center Drive (LOS F)
3. Otay Mesa Road from Corporate Center Drive to Heritage Road (LOS E
4. Otay Mesa Road from Otay Mesa Center Road to La Media Road (LOS E)
5. Heritage Road/Otay Valley Road from Main Street to Avenida de las Vistas (LOS F)
6. Heritage Road/Otay Valley Road from Avenida de las Vistas to Otay Mesa Road (LOS F)
7. La Media Road from Airway Road to Siempre Viva Road (LOS F)

Map Source: Urban Systems Associates, Inc. 2012



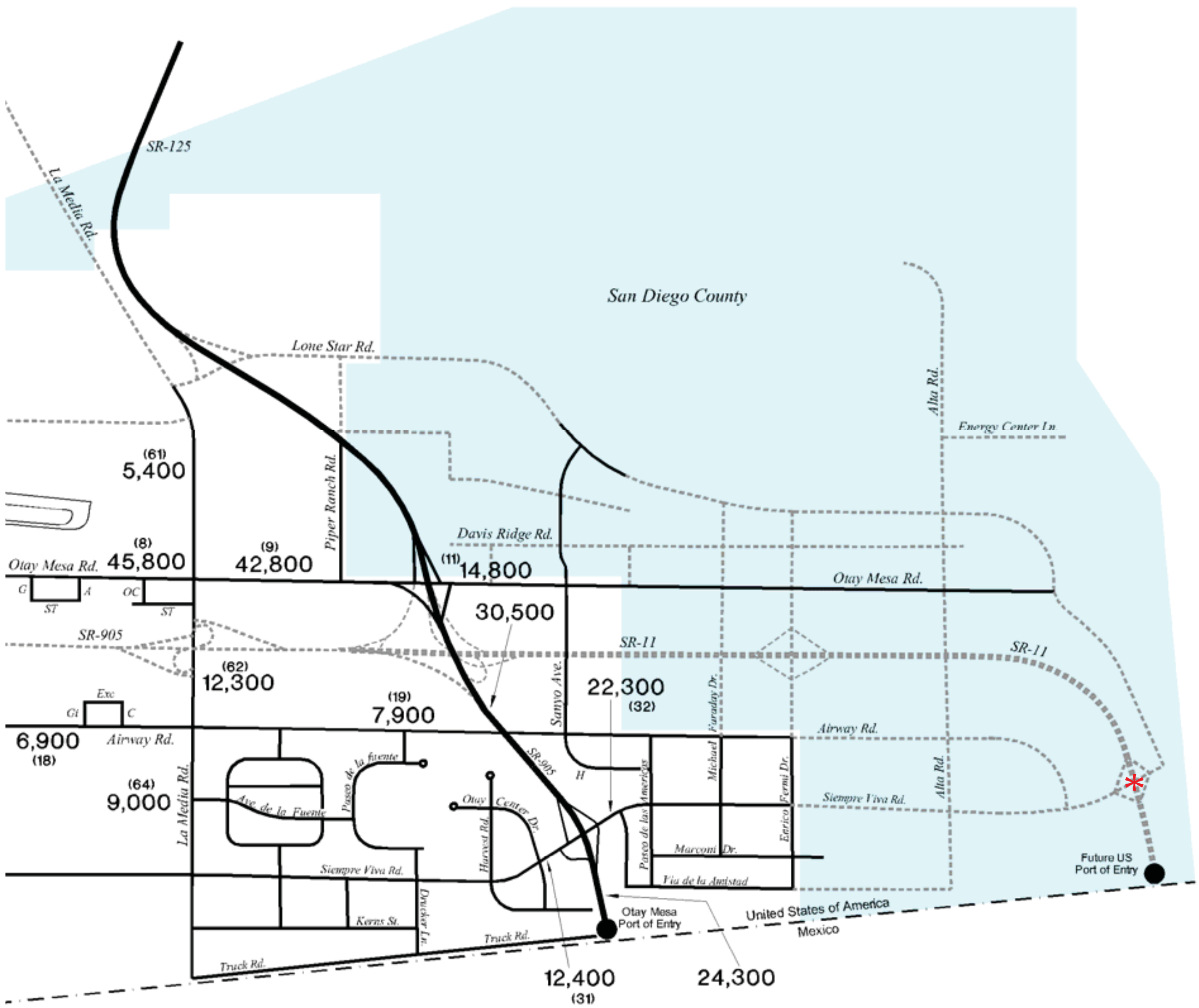
(XX) = Segment number, coincides with Buildout segment numbers.

Not to Scale

FIGURE 5.12-1a

Existing Condition Roadway Segment Volumes (West)

Map Source: Urban Systems Associates, Inc. 2012



Street Legend

OC = Otay Mesa Ctr. Rd.
G = Gailes Blvd.
A = Ailsa Ct.
ST = St. Andrews Ave.
H = Heinrich Hertz Dr.
C = Centurion St.
Gi = Gigantic St.
Exc = Excellante St.

(XX) = Segment number, coincides with Buildout segment numbers.

* - Refer to the Caltrans SR-11 and Otay Mesa POE Final Tier II EIR/EIS, March 2012 for the preferred alternative.

Not to Scale

FIGURE 5.12-1b

Existing Condition Roadway Segment Volumes (East)

TABLE 5.12-1
EXISTING SEGMENT OPERATIONS

Street Segment	Class	LOS E ADT	Existing ADT	V/C	LOS
Otay Mesa Road					
SR-905 to Caliente Ave.	6-PA	60,000	68,300	1.14	**F**
Caliente Ave. to Corporate Center Dr.	6-PA	60,000	63,900	1.07	**F**
Corporate Center Dr. to Heritage Rd.	6-PA	60,000	59,600	0.99	**E**
Heritage Rd. to Cactus Rd.	6-PA	60,000	52,400	0.87	D
Cactus Rd. to Britannia Blvd.	6-PA	60,000	52,900	0.88	D
Britannia Blvd. to Otay Mesa Center Rd.	6-PA	60,000	48,200	0.80	C
Otay Mesa Center Rd. to La Media Rd.	7-M	55,000	45,800	0.84	**E**
La Media Road to SR-125 SB Ramps	5-PA	55,000	42,800	0.78	C
SR-125 NB Ramps to Sanyo Ave.	4-M	40,000	14,800	0.37	A
Airway Road					
Britannia Blvd. to La Media Rd.	2-CL	15,000	6,900	0.46	B
La Media Rd. to Sanyo Ave.	2-CL	15,000	7,900	0.53	C
Siempre Viva Road					
Harvest Rd. to SR-905 SB Ramps	6-PA	60,000	12,400	0.21	A
SR-905 NB Ramps to Paseo de las Americas	6-PA	60,000	22,300	0.37	A
Palm Avenue					
I-805 NB Ramps to Dennery Rd.	6-PA	60,000	46,900	0.78	C
Ocean View Hills Parkway					
Dennery Rd. to Del Sol Blvd.	4-M	40,000	14,200	0.36	A
Del Sol Blvd. to Otay Mesa Rd.	6-M	50,000	7,000	0.14	A
Caliente Avenue					
Otay Mesa Rd. to Airway Rd.	4-M	40,000	6,100	0.15	A
Old Otay Mesa Road					
Otay Mesa Rd. to Airway Rd.	2-C	8,000	2,200	0.28	A
Beyer Boulevard					
Smythe Ave. to Old Otay Mesa Rd.	4-M	40,000	10,000	0.24	A
Heritage Road/Otay Valley Road					
Main St. to Avenida De Las Vistas	2-C	8,000	8,700	1.09	**F**
Avenida De Las Vistas to Otay Mesa Rd.	2-C	8,000	8,600	1.08	**F**
Cactus Road					
Otay Mesa Rd. to SR-905	4-CL	30,000	5,600	0.19	A
Britannia Boulevard					
Otay Mesa Rd. to Airway Rd.	4-M	40,000	6,400	0.16	A
La Media Road					
North of to Otay Mesa Rd.	2-CL	15,000	5,400	0.36	B
Otay Mesa Rd. to Airway Rd.	2-CL	15,000	12,300	0.82	D
Airway Rd. to Siempre Viva Rd.	2-C	8,000	9,000	1.13	**F**
Dennery Road					
Palm Ave. to Regatta Ln.	4-M	40,000	10,300	0.26	A
Palm Ave. to Walmart Dr.	4-M	40,000	24,500	0.61	C
Del Sol Boulevard					
West of Dennery Rd.	4-C	15,000	8,000	0.53	C

SOURCE: Appendix J (Urban Systems Associates, Inc.)
Shade/Bold = Unacceptable LOS; 7-M = 7-Lane Major Arterial; 6-PA = 6-Lane Primary Arterial; 6-M = 6-Lane Major; 4-M = 4-Lane Major; 5-PA = Lane Primary Arterial; 4-CL = 4-Lane Collector (With Left-Lane Turn Lane); 4-C = 4-Lane Collector (Without Left-Turn Lane); 2-CL = 2-Lane Collector (With Left-Turn Lane); and 2-C = 2-Lane Collector (Without Left-Turn Lane, Industrial Fronting).

b. Intersections

Existing intersection LOS is shown in Table 5.12-2 and Figures 5.12-2a and 5.12-2b. All intersections currently operate at LOS D or better during the AM and PM peak hour periods except at the one following location:

1. Otay Mesa Road/Heritage Road (LOS E in the AM peak hour)

TABLE 5.12-2
EXISTING INTERSECTION LEVELS OF SERVICE

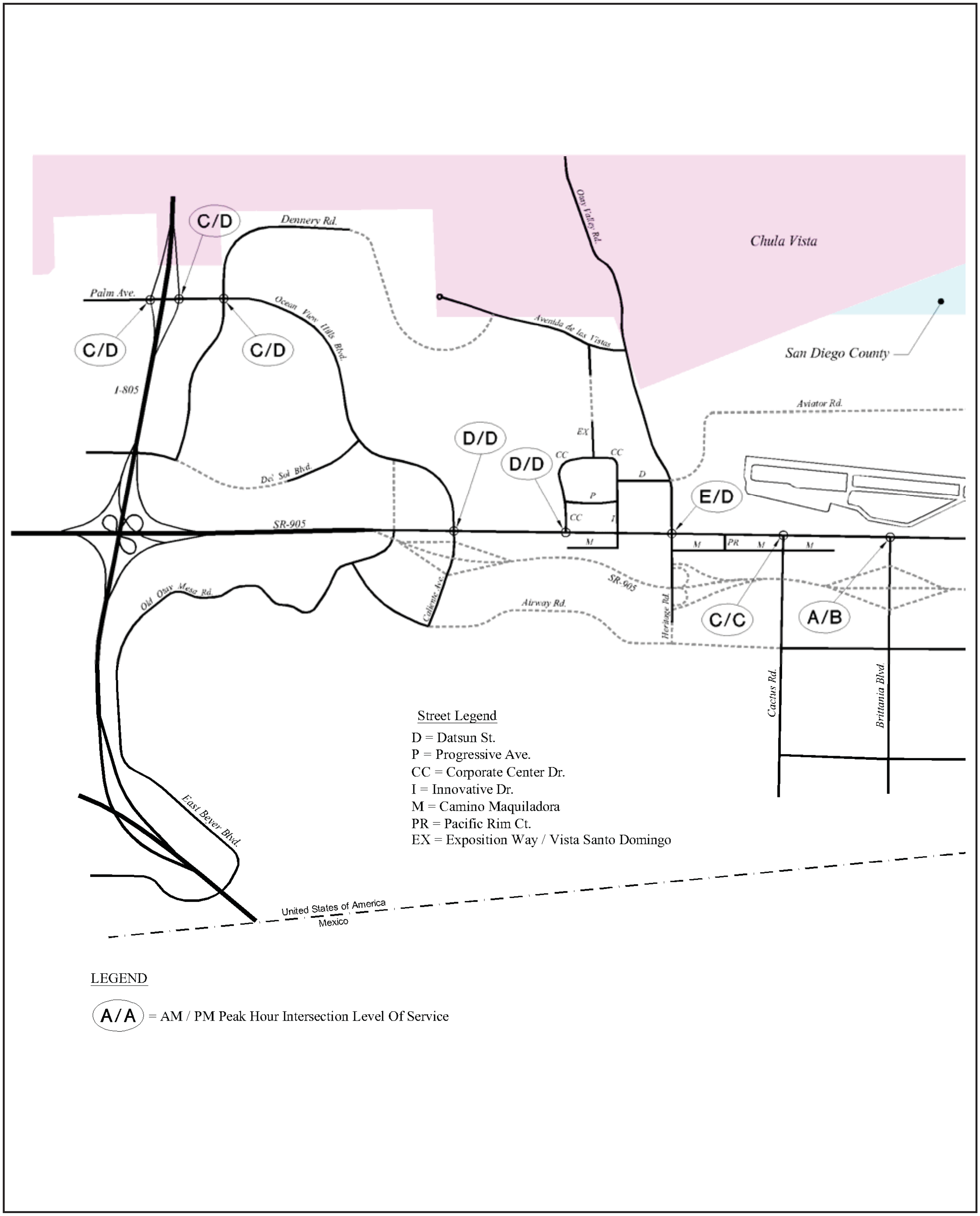
Intersection		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
1	Palm Ave./I-805 SB Ramps	27.5	C	45.4	D
2	Palm Ave./I-805 NB Ramps	33.4	C	51.0	D
3	Palm Ave./Dennery Rd.	34.9	C	37.9	D
4	Otay Mesa Rd./Caliente Ave.	44.4	D	40.2	D
5	Otay Mesa Rd./Corporate Center Dr.	35.7	D	35.0	D
6	Otay Mesa Rd./Heritage Rd.	60.5	**E**	42.6	D
7	Otay Mesa Rd./Cactus Rd.	33.4	C	31.6	C
8	Otay Mesa Rd./Britannia Blvd.	7.3	A	11.4	B
9	Otay Mesa Rd./La Media Rd.	15.8	B	43.2	D
10	Otay Mesa Rd./Piper Ranch Rd.	8.3	A	9.4	A
11	Otay Mesa Rd./SR-125 SB Off-Ramp.	7.6	A	3.7	A
12	Otay Mesa Rd./SR-125 NB On-Ramp	0.8	A	3.2	A
13A	Siempre Viva Rd./SR-905 SB Ramps	16.1	B	11.6	B
13B	SR-905 SB Off Ramp to WB Siempre Viva Rd.	14.3	B	14.4	B
14	Siempre Viva Rd./SR-905 NB Ramps	14.5	B	14.6	B

SOURCE: Appendix J (Urban Systems Associates, Inc. 2012).
Delay = Control Delay in seconds
LOS = Level of Service
Shade/Bold = Unacceptable LOS

c. Freeway Segments

Existing ADT and LOS for freeway segments within the CPU area are shown in Table 5.12-3. As shown, all freeway segments currently operate at an acceptable LOS D or better.

Map Source: Urban Systems Associates, Inc. 2012

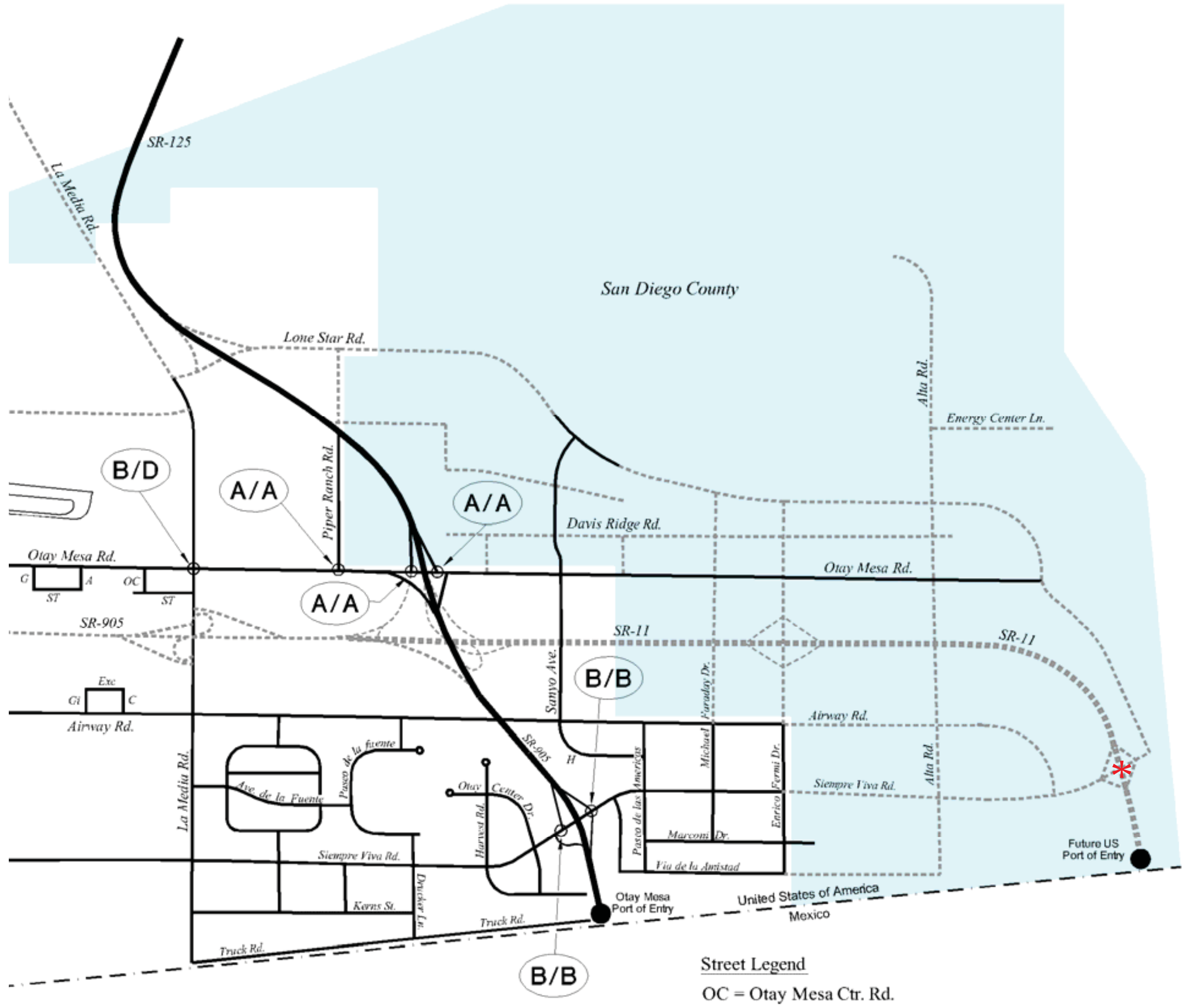


Not to Scale

FIGURE 5.12-2a

Existing Condition Intersection LOS (West)

Map Source: Urban Systems Associates, Inc. 2012



Street Legend

OC = Otay Mesa Ctr. Rd.
G = Gailes Blvd.
A = Ailsa Ct.
ST = St. Andrews Ave.
H = Heinrich Hertz Dr.
C = Centurion St.
Gi = Gigantic St.
Exc = Excellante St.

LEGEND

A/A = AM / PM Peak Hour Intersection Level Of Service

* - Refer to the Caltrans SR-11 and Otay Mesa POE Final Tier II EIR/EIS, March 2012 for the preferred alternative.

Not to Scale

FIGURE 5.12-2b

Existing Condition Intersection LOS (East)

TABLE 5.12-3
EXISTING FREEWAY SEGMENT LEVELS OF SERVICE

Freeway Segment	Lanes (1-Way)	Capacity	ADT	Peak Volume	V/C	LOS
Interstate 805						
Otay Valley Rd. - Palm Ave.	4+AUX	11,200	152,000	8,107	0.72	C
Palm Ave. - SR-905	4	9,400	124,000	6,613	0.70	C
SR-905 - San Ysidro Blvd.	4	9,400	58,000	3,093	0.33	A
SR-905						
Picador Blvd. - I-805	2	4,700	53,000	2,827	0.60	B
I-805 – Caliente Ave.	2	4,700	58,300	3,109	0.66	C
Otay Mesa Rd. - Siempre Viva Rd.	2	4,700	30,500	1,600	0.34	A
Siempre Viva Rd. – Border	3	4,700	24,300	1,296	0.28	A

SOURCE: Appendix J (Urban Systems Associates, Inc. 2012).
ADT = average daily traffic; V/C = volume-to-capacity ratio; LOS = level of service

5.12.1.4 Alternative Transportation

a. Transit

Within the CPU area, transit services are provided by the MTS. The northwestern part of the CPU area is served by bus routes 933/934 (MTS 2011). The routes travel to and from Del Sol Boulevard to Dennery Road to Palm Avenue into and out of the community. These routes serve the shopping centers along Dennery Road, the medical offices on Palm Avenue and Dennery Road, and the residences within this area. The eastern portion of the community is served by bus routes 905 and 905A. Bus route 905 provides regular service through the CPU area along Otay Mesa Road and SR-905. Bus route 905A provides limited service from Otay Mesa Road to SR-905 via Britannia Boulevard, Airway Road, La Media Road, and Siempre Viva Road with stops at Airway Road and Britannia Boulevard and Siempre Viva Road and Drucker Lane.

The Blue Line Trolley, which is outside of the CPU boundary, travels along the east side of I-5 within the neighboring community of San Ysidro and terminates at the San Ysidro Transit Center located at the U.S.-Mexico International Border.

b. Bikeways

The American Association of Highway and Transportation (AASHTO) and Caltrans have developed design standards for bikeways. The Caltrans Highway Design Manual, Chapter 1000: Bikeway Planning and Design, serves as the official standard for all bicycle facilities in California. While all roadways are open to bicycle travel unless it is specifically prohibited, the California Highway Design Manual establishes three classifications of facilities specifically for bicycle traffic. Based on the Otay Mesa Existing Conditions Report (City of San Diego 2004), there are Class II bikeways along Old Otay Mesa Road, portions of SR-905, Dennery Road, Ocean View Hills Parkway, Del Sol Boulevard, portions of Siempre Viva Road, Heinrick Hertz, Paseo de las

Americas, a portion of Enrico Fermi Drive, and Roll Drive within the CPU area. Per the City Street Design Manual, a Class II bikeway should be between 5 and 6 feet in width, and may be 4 feet in width when abutting a mandatory right-turn lane, with signs and pavement markings (City of San Diego 2002). Informal trails exist throughout the CPU area and are used by recreational bicyclists as well. These informal bikeways are not designated trails and often travel through private property.

c. Pedestrian Facilities

Sidewalk requirements for the City of San Diego are established through the Street Design Manual (City of San Diego 2002). The design requirements include a minimum 5-foot sidewalk, curb ramps at intersections, and compliance with the Americans with Disabilities Act (ADA). Sidewalks are generally required on both sides of streets. Sidewalks exist within the residential developments in the western CPU area. The majority of the commercial and industrial developments completed within the last 10 years provided sidewalks along their frontage roadways. However, sidewalks do not exist on many of the streets fronted by older developments and vacant properties. Informal trails exist throughout the CPU area, which are used by pedestrians but, as mentioned above, these trails are not designated and often are on private property.

5.12.2 Significance Determination Thresholds

Based on the City's Significance Determination Thresholds, impacts related to traffic and circulation would be significant if the CPU would:

1. Result in an increase in projected traffic that is substantial in relation to the capacity of the circulation system;

2. Result in an increase in traffic hazards for motor vehicles, bicyclists, or pedestrians;

3. Create alterations to present circulation movements in the area including effects on existing public access points; or

4. Conflict with the adopted policies, plans, or programs supporting alternative transportation modes (e.g., bus turnouts, trolley extensions, bicycle lanes, bicycle racks, etc.).

For this programmatic analysis, the CPU would result in a significant impact if a roadway segment, intersection, freeway segment, or freeway ramp meter would operate unacceptably in the Horizon Year Plus CPU condition (assumed buildout year of 2062). Since much of the community is undeveloped, a majority of the Circulation Element roadways are not built, are only partially built, or are not operating near capacity. The result of this is that for many facilities, an analysis of the CPU land uses on the existing transportation network was not possible or meaningful for purposes of identifying significant impacts or recommended mitigations. Therefore,~~ the proposed CPU land uses were analyzed on the draft CPU transportation network.~~ in order to provide a meaningful analysis and identify ultimate recommendations, the traffic study analyzed roadways based on the Adopted Community Plan Classifications and the CPU transportation network instead of the existing functional classifications. The TIA (see Appendix J) analysis identifies recommended CPU classifications, which were incorporated into the CPU (Mobility Element). As stated previously, roadway segments, intersections, and freeway segments are considered to operate acceptably from LOS A to LOS D, and unacceptably at LOS E or F. Metered freeway ramps are considered to operate unacceptably if the delay exceeds 15 minutes and the downstream freeway segment operates at an unacceptable LOS E or F.

5.12.3 Issue 1: Capacity

Would the CPU result in an increase in projected traffic that is substantial in relation to the capacity of the circulation system?

5.12.3.1 Impacts

a. Horizon Year plus CPU Assumptions

SANDAG's 2050 RTP indicates that substantial improvements would be made to the regional transportation system through Year 2050. Regional changes that would affect transportation/circulation include transit, managed/high-occupancy vehicle (HOV) lanes, highway, local roads, transportation demand management, land use, bicycle/pedestrian, and other related efforts. It should be noted that the RTP was updated several times during the development of the CPU. During its development, the TIS analysis was updated to reflect the current RTP. The travel forecast model used to develop future traffic volumes in the TIS was based on the Series 11 Regional Transportation Model which incorporates land use, population, and employment data then estimated for the year 2030. Land uses within the Otay Mesa Community Planning area were assumed to be built out within the traffic model using reasonable maximum development assumptions. The model network included the future transportation improvements that were assumed to be completed, and included Year 2030 Regional Transportation Plan "Reasonably Expected" projects in the region. The Otay Mesa model was modified to include a half-diamond interchange at SR-125 / Lone Star Road. Also, a portion of SR-125 was assumed as a toll facility and modeled to approximate toll conditions.

The differences in the vehicular circulation network between the existing conditions and the Horizon Year plus CPU primarily result from: (1) improvements completed or expected to be completed as a part of future subsequent development projects, consistent with the CPU Mobility Element; (2) funded and scheduled Otay Mesa Public

Facilities Financing Plan transportation projects; and (3) planned Caltrans improvements.

At the Horizon Year, the following improvements are assumed to be completed through buildout of the CPU Mobility Element roadway network (see Figure 3-6). Roadway improvements necessary to implement the CPU Mobility Element roadway network are included in the PFFP for Otay Mesa and would be implemented in conjunction with future projects, as conditions of approval or through payment of Facilities Benefit Assessment (FBA) fees.

- Otay Mesa Road as a 6-lane Primary Arterial from Caliente Avenue to the City limits.

- Airway Road as a 4-lane Collector street west of Caliente Avenue; as a 4-lane Major street from Caliente Avenue to west of Heritage Road; as a 6-lane Primary Arterial from Heritage Road to Cactus Road; as a 6-lane Major Street from Cactus Road to Britannia Boulevard; and as a 4-lane Major Street from Britannia Boulevard to Enrico Fermi Drive (City limits).

- Siempre Viva Road as a 6-lane Primary Arterial from Cactus Road to Paseo de las Americas; and as a 2-lane Collector with two-way left turn lane from Caliente to the west (not connecting to the community of San Ysidro).

- Sanyo Avenue as a four-lane Collector with two-way left turn lane, between Otay Mesa Road and Airway Road.

- Heinrich Hertz as a two-lane Collector with two-way left turn lane between Airway Road and Paseo de las Americas.

- Harvest Road as a 2-lane Collector from Otay Mesa Road to SR 905; and as a 4-lane Collector with two-way left turn lane from Airway to Siempre Viva Road.

- Otay Center Drive as a four-lane Collector with left-turn lane from Harvest Road to Siempre Viva Road.

- Piper Ranch Road as a 4-lane Collector with two-way left turn lane from Lone Star Road to Otay Mesa Road including a freeway underpass at SR 125.

- La Media Road as a 4-lane Major street from Lone Star Road to Otay Mesa Road; as a 6-lane Primary Arterial from Otay Mesa Road to Airway Road; and as a 5-lane Major Street from Airway Road to Siempre Viva Road.

- Lone Star Road as a 6-lane Primary Arterial from La Media Road to the City limits.

- Off-ramp from SR 125 Southbound to Lone Star Road and On-ramp from Lonestar Road to SR 125 Northbound.
- Britannia Boulevard as a 6-lane Primary Arterial from Otay Mesa Road to Airway Road; as a 6-lane Major street from Airway Road to Siempre Viva Road; and as a 4-lane Collector with two-way left turn lane from Siempre Viva Road to Britannia Court.
- Cactus Road as a 4-lane Major street from Otay Mesa Road to Siempre Viva Road, including a freeway overpass at SR 905.
- Heritage Road and Otay Valley Road as a 6-lane Primary Arterial from Main Street in Chula Vista to the proposed extension of Airway Road.
- Caliente Avenue as a 6-lane Primary Arterial from Otay Mesa Road to Airway Road; as a 6-lane Major street from Airway to the proposed Beyer Boulevard; and as a 4-lane Major street from Beyer Boulevard to the proposed Siempre Viva Road.
- Beyer Boulevard as a 4-lane Major Street from Enright Drive to the proposed extension of Caliente Avenue.
- Street A/Old Otay Mesa Road as a 4-lane Major Road from Ocean View Hills Drive to Airway Road including a freeway overpass at SR 905.
- Datsun Street as a 4-lane Collector with two-way left turn lane from Innovative Drive to Heritage Road.
- Aviator Road as a 4-lane Collector with two-way left turn lane from Heritage Road to La Media Road.
- Dennery Road as a 2-lane Collector from Topsail Drive to Avenida de las Vistas.
- Del Sol Boulevard as a 2-lane Collector from Riviera Pointe Street to Surf Crest Drive.
- Vista Santo Domingo/Exposition Way as a 2-lane Collector from Avenida de las Vistas to Corporate Center Drive.
- Emerald Crest Drive as a 4-lane Collector with two way left turn lane from Otay Mesa Road to SR 905.
- Corporate Center Drive as a 4-lane Collector with two way left turn lane from Otay Mesa Road to SR 905.

- Innovative Drive as a 2-lane Collector with two way left turn lane from Otay Mesa Road to SR 905.

- Continental Street as a 2-lane Collector from Otay Mesa Road to Camino Maquiladora; and as a 2-lane Collector with two-way left turn lane from Airway to the north.

- Otay Mesa Center Road as a 4-lane Collector with two-way left turn lane from Otay Mesa Road to Saint Andrews Avenue.

- Saint Andrews Avenue as a 4-lane Collector with two-way left turn lane from Otay Mesa Center Road to La Media Road.

- Paseo de las Americas as a 4-lane Collector with two-way left turn lane from Airway Road to Marconi Drive.

- Marconi Drive as a 2-lane Collector with two-way left turn lane from Paseo de las Americas to Enrico Fermi Drive.

- Avenida Costa Azul as a 4-lane Collector with two-way left turn lane from Otay Mesa Road to the south.

The SANDAG 2050 RTP includes the addition of two managed HOV lanes to the I-805 and a northbound auxiliary lane. As these projects were funded and planned by Caltrans, the analysis included these improvements. SR-905 was designed to allow for future HOV lanes as well; however, the funding for these improvements has not been secured. Therefore, the SR-905 HOV lanes are not included in the traffic analysis. The 2050 RTP also includes SR-11 which will continue east-west from SR-905 to the County to a future additional Port of Entry; a full interchange between SR-125 (toll), SR-905, and the future SR-11 (toll).

As the City of Chula Vista has recently approved a General Plan Amendment (GPA) with the elimination of the La Media Road bridge crossing the Otay River Valley, two 2050 Horizon Year scenarios were analyzed in the TIA (see Appendix J). The Horizon Year without the La Media Road Connection Scenario is utilized to determine the environmental impacts in this section of the PEIR because La Media Road is not reasonably expected to be completed.

As indicated in Section 5.12.2, in order to provide a meaningful analysis and identify ultimate recommendations, the traffic study analyzed roadways based on the Adopted Community Plan Classifications and CPU network instead of the existing functional classifications. The TIA (see Appendix J) analysis identifies recommended CPU classifications, which were incorporated into the CPU (Mobility Element). The proposed classifications incorporated into the CPU are shown in Table 5.12-4 below.

TABLE 5.12-4
PROPOSED CPU ROADWAY CLASSIFICATIONS

Street	Segment	Existing CP Class	CPU Class
Otay Mesa Road	Street A to Caliente Ave.	6-PA	6-M
	Alisa Ct. to La Media Rd.	6-PA	6-PA
	La Media Rd. to Piper Ranch Rd.	7-M	6-PA
	Piper Ranch Rd. to SR-125	8-M	6-PA
	SR-125 to Harvest Rd.	4-P	6-PA
	Harvest Rd. to Sanyo Ave.	4-M	6-PA
	Sanyo Ave. to Enrico Fermi Dr.	4-M	6-PA
Airway Road	Heritage Rd. to Cactus Rd.	4-M	6-PA
	Cactus Rd. to Britannia Blvd.	4-M	6-M
Siempre Viva Road	Caliente Ave. to West Terminus	4-M	2-CL
Caliente Avenue	Otay Mesa Rd. to SR-905	6-M	6-PA
	SR-905 to Airway Rd.	6-M	6-PA
	Airway Rd. to Beyer Blvd.	4-M	6-M
Heritage Road/Otay Valley Road	Avenida De Las Vistas to Datsun St.	6-M	6-PA
	Datsun St. to Otay Mesa Rd.	6-M	6-PA
	Otay Mesa Rd. to SR-905	6-M	6-PA
	SR-905 to Airway Rd.	6-M	6-PA
Cactus Road	Otay Mesa Rd. to Airway Rd.	4-CL	4-M
	Airway Rd. to Siempre Viva Rd.	4-CL	4-M
Britannia Boulevard	Otay Mesa Rd. to SR-905	4-M	6-PA
	SR-905 to Airway Rd.	4-M	6-PA
	Airway Rd. to Siempre Viva Rd.	4-M	6-M
	Siempre Viva Rd. to South End	2-C	4-CL
La Media Road	Birch Rd. to Lone Star Rd.	6-PA	N/A
	Lone Star Rd. to Aviator Rd.	6-PA	4-M
	Aviator Rd. to Otay Mesa Rd.	6-PA	4-M
	Airway Rd. to Siempre Viva Rd.	4-M	5-M
Harvest Road	South of Otay Mesa Rd.	4-M	2-CL
	Airway Rd. to Otay Center Dr.	4-M	4-CL
	Otay Center Dr. to Siempre Viva Rd.	4-M	4-CL
Enrico Fermi Drive	Airway Rd. to Siempre Viva Rd.	4-M	4-CL
	Siempre Viva Rd. to Via de la Amistad	4-M	4-CL
Lone Star Road	SR-125 to Piper Ranch Rd.	4-M	6-PA
	Piper Ranch Rd. to City/County Boundary	4-M	6-PA
Aviator Road	Heritage Rd. to La Media Rd. [1]	2-C	4-CL
Corporate Center Drive	Progressive Ave. to Innovative Dr.	2-C	2-CL
Sanyo Avenue	Otay Mesa Rd. to Airway Rd. [2]	4-C	4-CL
Paseo de las Americas	Airway Rd. to Siempre Viva Rd.	2-C	4-CL
	Siempre Viva Rd. to Marconi Dr.	2-C	4-CL
Marconi Drive	Paseo de las Americas to Enrico Fermi Dr.	2-C	2-CL
Otay Center Drive	Harvest Rd. to Siempre Viva Rd.[2]	4-C	4-CL
St. Andrews Avenue	Otay Mesa Center Rd. to La Media Rd.	2-C	4-CL
Gailes Boulevard	Otay Mesa Rd. to St. Andrews Ave.	2-C	4-C
Otay Mesa Center Road	Otay Mesa Rd. to St. Andrews Ave.	2-C	4-CL
Datsun Street	Innovative Dr. to Heritage Rd. [1]	2-C	4-CL
Avenida Costa Azul	Otay Mesa Rd. to St. Andrews Ave. [1]	2-CL	4-CL
Excellante Street	Airway Rd. to Gigantic St.	4-C	2-C
Gigantic Street	Excellante St. to Centurion St.	4-C	2-C
Centurion Street	Airway Rd. to Gigantic St.	4-C	2-C

1A new roadway added to Circulation Plan by the CPU.
[2]Functional classification is identified in the table, as this roadway is not currently classified.

8-M = 8-lane Major Arterial
7-PA = 7-lane Primary Arterial
7-M = 7-lane Major Arterial
6-PA = 6-lane Primary Arterial
6-M = 6-lane Major Arterial
5-M = 5-lane Major Arterial (3SB /2NB)
4-P = 4-lane Primary Arterial

4-M = 4-lane Major Arterial
4-CL = 4-lane Collector (with continuous left-turn lane)
4-C = 4-lane Collector (without continuous left-turn lane)
2-CL = 2-lane Collector (with continuous left-turn lane)
2-CN = 2-lane Collector (no fronting property)
2-C = 2-lane Collector (without continuous left-turn lane)

b. Horizon Year Plus CPU Condition

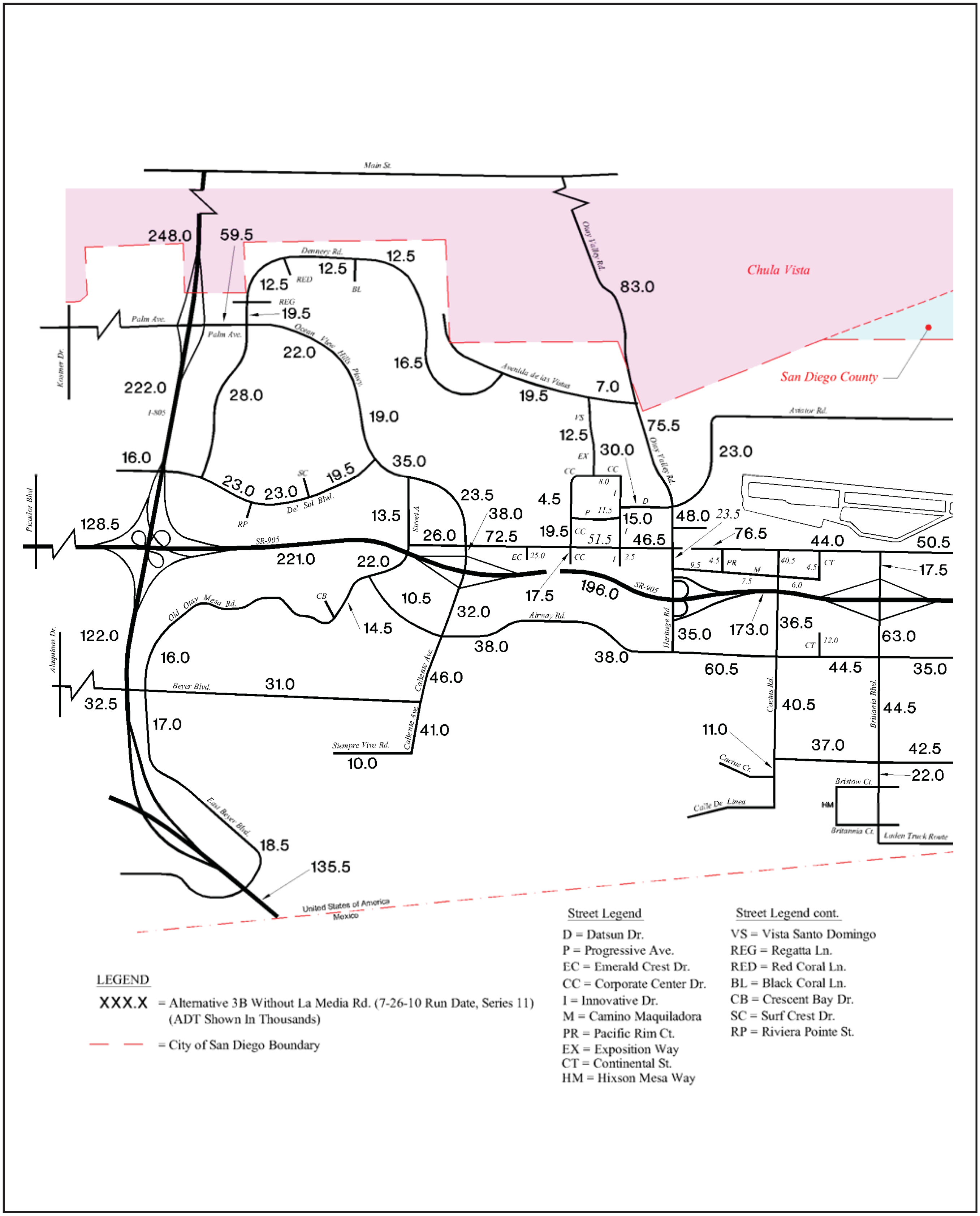
Roadway Segments

The volumes under the Horizon Year Plus CPU conditions are shown on Figures 5.12-3a and 5.12-3b. With the specified proposed classifications, the following roadway segments would be expected to operate at unacceptable levels of service in the Horizon Year Plus CPU condition (Table 5.12-5).

1. Otay Mesa Road, Caliente Ave. to Corporate Center Dr. (LOS F)
2. Otay Mesa Road, Heritage Rd. to Cactus Rd. (LOS F)
3. Airway Road, Caliente Ave. to Heritage Rd. (LOS E)
4. Airway Road, Heritage Rd. to Cactus Rd. (LOS F)
5. Siempre Viva Road, Otay Center Dr. to SR-905 (LOS E)
6. Siempre Viva Road, SR-905 to Paseo de las Americas (LOS F)
7. Caliente Avenue, Airway Rd. to Beyer Blvd. (LOS E)
8. Caliente Avenue, Beyer Blvd. to Siempre Viva Rd. (LOS F)
9. Heritage Road/ Otay Valley Road, Main St. to Avenida de Las Vistas (LOS F)
10. Heritage Road/ Otay Valley Road, Avenida De Las Vistas to Datsun St. (LOS F)
11. Cactus Road, Otay Mesa Rd. to Airway Rd. (LOS F)
12. Cactus Road, Airway Rd. to Siempre Viva Rd. (LOS F)
13. Britannia Boulevard, SR-905 to Airway Rd. (LOS F)
14. La Media Road, SR-905 to Airway Rd. (LOS F)
15. Dennery Road, Black Coral Ln. to East End (LOS F)
16. Avenida De Las Vistas, Vista Santo Domingo to Dennery Rd. (LOS F)
17. Del Sol Boulevard, Surf Crest Dr. to Riviera Pointe (LOS F)
18. Del Sol Boulevard, Riviera Pointe to Dennery Rd. (LOS F)
19. Old Otay Mesa Road, Crescent Bay Dr. to Beyer Blvd. (LOS F)
20. Camino Maquiladora, Heritage Rd. to Pacific Rim Ct. (LOS F)
21. Camino Maquiladora, Pacific Rim Ct. to Cactus Rd. (LOS E)
22. Progressive Avenue, Corporate Center Dr. to Innovative Dr. (LOS F)
23. Datsun Street, Innovative Dr. to Heritage Rd. (LOS F)
24. Exposition Way/Vista Santo Domingo, Avenida de las Vistas to Corporate Dr. (LOS F)

The CPU impacts to the above 24 roadway segments would be significant.

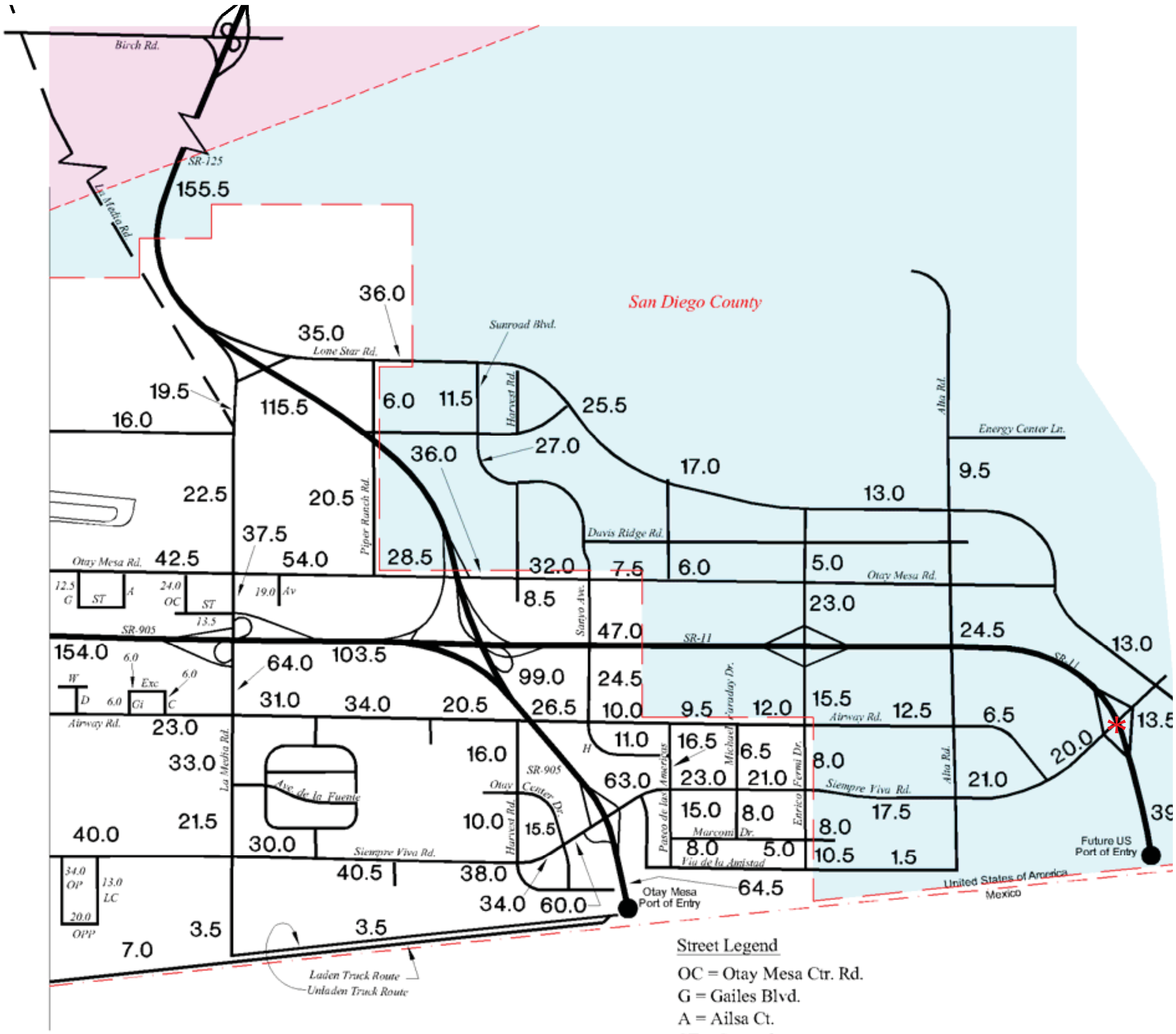
Map Source: Urban Systems Associates, Inc. 2012



Not to Scale

FIGURE 5.12-3a

Horizon Year Plus CPU Condition Roadway Segment Volumes (West)



Street Legend

OC = Otay Mesa Ctr. Rd.
G = Gailes Blvd.
A = Ailsa Ct.
ST = St. Andrews Ave.
H = Heinrich Hertz Dr.
C = Centurion St.
Gi = Gigantic St.
Exc = Excellante St.
Av = Avenida Costa Azul
W = Waterville Rd.
D = Dublin Dr.
OP = Otay Pacific Dr.
OPP = Otay Pacific Pl.
LC = Las Californias Dr.

LEGEND

XXX.X = Alternative 3B Without La Media Rd. (7-26-10 Run Date, Series 11) (ADT Shown In Thousands)

— — = City of San Diego Boundary

* - Refer to the Caltrans SR-11 and Otay Mesa POE Final Tier II EIR/EIS, March 2012 for the preferred alternative.

Not to Scale

FIGURE 5.12-3b

Horizon Year Plus CPU Condition Roadway Segment Volumes (East)

TABLE 5.12-5
CPU HORIZON YEAR ROADWAY SEGMENT LEVEL OF SERVICE

Street	Segment	Horizon Year					Horizon Year with CPU			Sig?
		Class[1]	LOS E ADT[2]	Segment ADT	V/C	LOS	New Class	New V/C	New LOS	
Otay Mesa Road	Street A to Caliente Ave.	6-PA	60,000	26,000	0.43	B	6-M	0.52	B	N
	Caliente Ave. to Corporate Center Dr.	6-PA	60,000	72,500	1.21	**F**	-	-	-	**Y**
	Corporate Center Dr. to Innovative Dr.	6-PA	60,000	51,500	0.86	D	-	-	-	N
	Innovative Dr. to Heritage Rd.	6-PA	60,000	46,500	0.78	C	-	-	-	N
	Heritage Rd. to Cactus Rd.	6-PA	60,000	76,500	1.28	**F**	-	-	-	**Y**
	Cactus Rd. to Britannia Blvd.	6-PA	60,000	44,000	0.73	C	-	-	-	N
	Britannia Blvd. to Ailsa Ct.	6-PA	60,000	50,500	0.84	D	-	-	-	N
	Alisa Ct. to La Media Rd.	7-M	55,000	42,500	0.77	C	6-PA	0.71	C	N
	La Media Rd. to Piper Ranch Rd.	8-M	70,000	54,000	0.77	C	6-PA	0.90	D	N
	Piper Ranch Rd. to SR-125	4-P	45,000	28,500	0.63	C	6-PA	0.48	B	N
	SR-125 to Harvest Rd.	4-M	40,000	36,000	0.90	**E**	6-PA	0.60	C	N
	Harvest Rd. to Sanyo Ave.	4-M	40,000	32,000	0.80	D	6-PA	0.53	B	N
	Sanyo Ave. to Enrico Fermi Dr.	4-M	40,000	7,500	0.19	A	6-PA	0.13	A	N
Airway Road	Old Otay Mesa Rd. to Caliente Ave.	4-CL	30,000	10,500	0.35	A	-	-	-	N
	Caliente Ave. to Heritage Rd.	4-M	40,000	38,000	0.95	**E**	-	-	-	**Y**
	Heritage Rd. to Cactus Rd.	4-M	40,000	60,500	1.52	**F**	6-PA	1.01	F	**Y**
	Cactus Rd. to Britannia Blvd.	4-M	40,000	44,500	1.11	**F**	6-M	0.89	D	N
	Britannia Blvd. to La Media Rd.	4-M	40,000	35,000	0.88	D	-	-	-	N
	La Media Rd. to Harvest Rd.	4-M	40,000	34,000	0.85	D	-	-	-	N
	Harvest Rd. to Sanyo Ave.	4-M	40,000	26,500	0.66	C	-	-	-	N
	Sanyo Ave. to Paseo de las Americas	4-M	40,000	10,000	0.25	A	-	-	-	N
	Paseo de las Americas to Michael Faraday Dr.	4-M	40,000	9,500	0.24	A	-	-	-	N
	Michael Faraday Dr. to Enrico Fermi Dr.	4-M	40,000	12,000	0.30	A	-	-	-	N
	Enrico Fermi Dr. to Siempre Viva Rd.*	4-M	40,000	12,500	0.31	A	-	-	-	N
Siempre Viva Road	Caliente Ave. to West Terminus	4-M	40,000	10,000	0.25	A	2-CL	0.67	C	N
	Cactus Rd. to Britannia Blvd.	6-PA	60,000	37,000	0.62	C	-	-	-	N
	Britannia Blvd. to La Media Rd.	6-PA	60,000	42,500	0.71	C	-	-	-	N
	La Media Rd. to Harvest Rd.	6-PA	60,000	40,500	0.68	C	-	-	-	N
	Harvest Rd. to Otay Center Dr.	6-PA	60,000	34,000	0.57	B	-	-	-	N
	Otay Center Dr. to SR-905	6-PA	60,000	60,000	1.00	**E**	-	-	-	**Y**
	SR-905 to Paseo de las Americas	6-PA	60,000	63,000	1.05	**F**	-	-	-	**Y**
	Paseo de las Americas to Michael Faraday Dr.	4-M	40,000	23,000	0.58	C	-	-	-	N
	Michael Faraday Dr. to Enrico Fermi Dr.	4-M	40,000	21,000	0.53	B	-	-	-	N
	Enrico Fermi Dr. to SR-11*	4-M	40,000	17,500	0.44	B	-	-	-	N

TABLE 5.12-5
CPU HORIZON YEAR ROADWAY SEGMENT LEVEL OF SERVICE
(continued)

		Horizon Year					Horizon Year with CPU			
Street	Segment	Class[1]	LOS E ADT[2]	Segment ADT	V/C	LOS	New Class	New V/C	New LOS	Sig?
Palm Ave.	I-805 to Dennery Rd.	7-PA	65,000	59,500	0.92	D	-	-	-	N
Ocean View Hills Parkway	Dennery Rd. to Del Sol Blvd.	4-M	40,000	22,000	0.55	C	-	-	-	N
	Del Sol Blvd. to Street "A"	6-M	50,000	35,000	0.70	C	-	-	-	N
	Street "A" to Otay Mesa Rd.	6-M	50,000	23,500	0.42	B	-	-	-	N
Caliente Avenue	Otay Mesa Rd. to SR-905	6-M	50,000	38,000	0.76	C	6-PA	0.63	C	N
	SR-905 to Airway Rd.	6-M	50,000	32,000	0.64	C	6-PA	0.53	B	N
	Airway Rd. to Beyer Blvd.	4-M	40,000	46,000	1.15	**F**	6-M	0.92	**E**	**Y**
	Beyer Blvd. to Siempre Viva Rd.	4-M	40,000	41,000	1.03	**F**	-	-	-	**Y**
Beyer Boulevard	Alaquinas Dr. to Old Otay Mesa Rd.	4-M	40,000	32,500	0.81	D	-	-	-	N
	Old Otay Mesa Rd. to Caliente Ave.[3]	4-M	40,000	31,000	0.78	D	-	-	-	N
Heritage Road/ Otay Valley Road	Main St. to Avenida de Las Vistas**	6-PA	60,000	83,000	1.38	**F**	-	-	-	**Y**
	Avenida De Las Vistas to Datsun St.	6-M	50,000	75,500	1.51	**F**	6-PA	1.26	**F**	**Y**
	Datsun St. to Otay Mesa Rd.	6-M	50,000	48,000	0.96	**E**	6-PA	0.80	C	N
	Otay Mesa Rd. to SR-905	6-M	50,000	23,500	0.47	B	6-PA	0.39	A	N
	SR-905 to Airway Rd.	6-M	50,000	35,000	0.70	C	6-PA	0.58	B	N
Cactus Road	Otay Mesa Rd. to Airway Rd.	4-CL	30,000	40,500	1.35	**F**	4-M	1.01	**F**	**Y**
	Airway Rd. to Siempre Viva Rd.	4-CL	30,000	40,500	1.35	**F**	4-M	1.01	**F**	**Y**
	Siempre Viva Rd. to South End	2-CL	15,000	11,000	0.73	D	-	-	-	N
Britannia Boulevard	Otay Mesa Rd. to SR-905	4-M	40,000	17,500	0.44	B	6-PA	0.29	A	N
	SR-905 to Airway Rd.	4-M	40,000	63,000	1.58	**F**	6-PA	1.05	**F**	**Y**
	Airway Rd. to Siempre Viva Rd.	4-M	40,000	44,500	1.11	**F**	6-M	0.89	D	N
	Siempre Viva Rd. to South End	2-C	8,000	22,000	2.75	**F**	4-CL	0.73	D	N
La Media Road	Birch Rd. to Lone Star Rd.**	6-PA	60,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lone Star Rd. to Aviator Rd.	6-PA	60,000	19,500	0.33	A	4-M	0.49	B	N
	Aviator Rd. to Otay Mesa Rd.	6-PA	60,000	22,500	0.38	A	4-M	0.56	C	N
	Otay Mesa Rd. to SR-905	6-PA	60,000	37,500	0.63	C	-	-	-	N
	SR-905 to Airway Rd.	6-PA	60,000	64,000	1.06	**F**	-	-	-	**Y**
	Airway Rd. to Siempre Viva Rd.	4-M	40,000	33,000	0.83	D	5-M	0.73	C	N
Harvest Road	South of Otay Mesa Rd.	4-M	40,000	8,500	0.21	A	2-CL	0.57	C	N
	Airway Rd. to Otay Center Dr.	4-M	40,000	16,000	0.40	B	4-CL	0.53	C	N
	Otay Center Dr. to Siempre Viva Rd.	4-M	40,000	10,000	0.25	A	4-CL	0.33	A	N
Enrico Fermi Drive	SR-11 to Airway Rd.*	4-M	40,000	15,500	0.62	B	-	-	-	N
	Airway Rd. to Siempre Viva Rd.	4-M	40,000	8,000	0.20	A	4-CL	0.27	A	N
	Siempre Viva Rd. to Via de la Amistad	4-M	40,000	10,500	0.26	A	4-CL	0.35	B	N

TABLE 5.12-5
CPU HORIZON YEAR ROADWAY SEGMENT LEVEL OF SERVICE
(continued)

Street	Segment	Horizon Year					Horizon Year with CPU			Sig?
		Class[1]	LOS E ADT[2]	Segment ADT	V/C	LOS	New Class	New V/C	New LOS	
Lone Star Road	SR-125 to Piper Ranch Rd.	4-M	40,000	35,000	0.88	D	6-PA	0.58	B	N
	Piper Ranch Rd. to City/County Boundary	4-M	40,000	36,000	0.90	**E**	6-PA	0.60	C	N
Aviator Road	Heritage Rd. to La Media Rd. [3]	2-C	8,000	23,000	2.88	F	4-CL	0.77	D	N
Dennery Road	Palm Ave. to Del Sol Blvd.	4-M	40,000	28,000	0.70	C	-	-	-	N
	Palm Ave. to Regatta Ln.	4-M	40,000	19,500	0.49	B	-	-	-	N
	Regatta Ln. to Red Coral Ln.	4-CL	30,000	12,500	0.42	B	-	-	-	N
	Red Coral Ln. to Black Coral Ln.	2-CL	15,000	12,500	0.83	D	-	-	-	N
	Black Coral Ln. to East End	2-CN	10,000	16,500	1.65	**F**	-	-	-	**Y**
Avenida De Las Vistas	Otay Valley Rd. to Vista Santo Domingo	2-CN	10,000	7,000	0.70	C	-	-	-	N
	Vis ta Santo Domingo to Dennery Rd.	2-CN	10,000	19,500	1.95	**F**	-	-	-	**Y**
Del Sol Boulevard	Ocean View Hills Pkwy. to Surf Crest Dr.	4-CL	30,000	19,500	0.65	C	-	-	-	N
	Surf Crest Dr. to Riviera Pointe	2-CN	10,000	23,000	2.30	**F**	-	-	-	**Y**
	Riviera Pointe to Dennery Rd.	2-CL	15,000	23,000	1.53	**F**	-	-	-	**Y**
	Dennery Rd. to I-805	4-CL	30,000	16,000	0.53	C	-	-	-	N
Street A	Ocean View Hills Pkwy. to Otay Mesa Rd.	4-M	40,000	13,500	0.34	A	-	-	-	N
Old Otay Mesa Road	Otay Mesa Rd. to Airway Rd.	4-CL	30,000	22,000	0.73	D	-	-	-	N
	Airway Rd. to Crescent Bay Dr.	4-CL	30,000	14,500	0.48	C	-	-	-	N
	Crescent Bay Dr. to Beyer Blvd.	2-C	8,000	16,000	2.00	**F**	-	-	-	**Y**
Emerald Crest Dr.	Otay Mesa Rd. to South End [3]	4-CL	30,000	25,000	0.83	D	-	-	-	N
Corporate Center Drive	South End to Otay Mesa Rd. [3]	4-CL	30,000	17,500	0.58	C	-	-	-	N
	Otay Mesa Rd. to Progressive Ave.	4-CL	30,000	19,500	0.65	C	-	-	-	N
	Progressive Ave. to Innovative Dr.	2-C	8,000	8,000	1.00	**E**	2-CL	0.53	C	N
Innovative Drive	Otay Mesa Rd. to Corporate Center Dr.	4-CL	30,000	15,000	0.50	C	-	-	-	N
Piper Ranch Road	Lone Star Rd. to Otay Mesa Rd.	4-CL	30,000	20,500	0.68	D	-	-	-	N
Sanyo Avenue	Otay Mesa Rd. to Airway Rd. [4]	4-C	15,000	24,500	1.63	**F**	4-CL	0.82	D	N
Heinrich Hertz Drive	Airway Rd. to Paseo de las Americas[4]	2-CL	15,000	12,000	0.80	D	-	-	-	N
Paseo de las Americas	Airway Rd. to Siempre Viva Rd.	2-C	8,000	16,500	2.06	**F**	4-CL	0.55	C	N
	Siempre Viva Rd. to Marconi Dr.	2-C	8,000	15,000	1.88	**F**	4-CL	0.50	C	N
Marconi Drive	Paseo de las Americas to Enrico Fermi Dr.	2-C	8,000	8,000	1.00	**E**	2-CL	0.53	C	N
Otay Center Drive	Harvest Rd. to Siempre Viva Rd.[4]	4-C	15,000	15,500	1.03	**F**	4-CL	0.52	C	N
Michael Faraday Drive	Airway Rd. to Siempre Viva Rd. [4]	2-CL	15,000	6,500	0.43	B	-	-	-	N
	Siempre Viva Rd. to Marconi Dr. [4]	2-CL	15,000	8,000	0.53	C	-	-	-	N
St. Andrews Avenue	Otay Mesa Center Rd. to La Media Rd.	2-C	8,000	13,500	1.69	**F**	4-CL	0.45	C	N

TABLE 5.12-5
CPU HORIZON YEAR ROADWAY SEGMENT LEVEL OF SERVICE
(continued)

Street	Segment	Horizon Year					Horizon Year with CPU			Sig?
		Class[1]	LOS E ADT[2]	Segment ADT	V/C	LOS	New Class	New V/C	New LOS	
Gailes Boulevard	Otay Mesa Rd. to St. Andrews Ave.	2-C	8,000	12,500	1.56	**F**	4-C	0.83	D	N
Camino Maquiladora	Heritage Rd. to Pacific Rim Ct.	2-C	8,000	9,500	1.19	**F**	-	-	-	**Y**
	Pacific Rim Ct. to Cactus Rd.	2-C	8,000	7,500	0.94	**E**	-	-	-	**Y**
	Cactus Rd. to Continental St.	2-C	8,000	6,000	0.75	D	-	-	-	N
Pacific Rim Court	Otay Mesa Rd. to Camino Maquiladora	2-C	8,000	4,500	0.56	C	-	-	-	N
Progressive Avenue	Corporate Center Dr. to Innovative Dr.	2-C	8,000	11,500	1.44	**F**	-	-	-	**Y**
Otay Mesa Center Road	Otay Mesa Rd. to St. Andrews Ave.	2-C	8,000	24,000	1.60	**F**	4-CL	0.80	D	N
Datsun Street	Innovative Dr. to Heritage Rd. [3]	2-C	8,000	30,000	3.75	**F**	4-CL	1.00	**E**	**Y**
Avenida Costa Azul	Otay Mesa Rd. to St. Andrews Ave. [3]	2-CL	15,000	19,000	1.27	**F**	4-CL	0.63	B	N
Excellante Street	Airway Rd. to Gigantic St.	4-C	15,000	6,000	0.40	B	2-C	0.75	D	N
Gigantic Street	Excellante St. to Centurion St.	4-C	15,000	6,000	0.40	B	2-C	0.75	D	N
Centurion Street	Airway Rd. to Gigantic St.	4-C	15,000	6,000	0.40	B	2-C	0.75	D	N
Exposition Way/ Vista Santo Domingo	Avenida De Las Vistas to Corporate Dr. [4]	2-CN	10,000	12,500	1.25	**F**	-	-	-	**Y**
Continental Street	South of Otay Mesa Rd.	2-C	8,000	4,500	0.56	C	-	-	-	N
	North of Airway Rd.	2-CL	15,000	12,000	0.80	D	-	-	-	N

NOTE:
*Segment in County of San Diego
**Segment in City of Chula Vista
[1]Current Community Plan Classification, unless footnotes [3] or [4] apply.
[2]Source: City of San Diego Traffic Impact Study Manual, Table 2.
[3]Add to Circulation Plan.
[4]Functional classification shown, not currently classified.
Sig? = Significant impact, Yes (Y) or No (N).
New LOS = LOS after change in classification.
- = No reclassification is proposed by the CPU.
N/A = Not applicable, as this analysis assumes the segment of La Media Road between Birch Road and Lone Star Road is not completed since the City of Chula Vista has removed it from their facilities financing plan.

Legend
8-M = 8-lane Major Arterial
7-PA = 7-lane Primary Arterial
7-M = 7-lane Major Arterial
6-PA = 6-lane Primary Arterial
6-M = 6-lane Major Arterial
5-M = 5-lane Major Arterial (3SB /2NB)
4-P = 4-lane Primary Arterial
4-M = 4-lane Major Arterial
4-CL = 4-lane Collector (with continuous left-turn lane)
4-C = 4-lane Collector (without continuous left-turn lane)
2-CL = 2-lane Collector (with continuous left-turn lane)
2-CN = 2-lane Collector (no fronting property)
2-C = 2-lane Collector (without continuous left-turn lane)

Intersections

With the specified proposed classifications the following intersections would be expected to operate at unacceptable levels of service in the Horizon Year Plus CPU condition (Table 5.12-6):

1. Palm Ave./I-805 NB Ramps (LOS F in the AM and PM peak hours)
2. Palm Ave./Dennery Rd. (LOS E in the PM peak hour)
3. Otay Mesa Rd./Caliente Ave. (LOS F in the AM and PM peak hours)
4. Caliente Ave./SR-905 WB Ramps (LOS F in the AM peak hour and LOS D with excessive queues blocking the intersection in the PM peak hour)
5. Caliente Ave./SR-905 EB Ramps (LOS F in the AM and PM peak hours)
6. Caliente Ave./Airway Rd. (LOS F in the AM and PM peak hours)
7. Caliente Ave./Beyer Blvd. (LOS F in the AM and PM peak hours)
8. Otay Mesa Rd./Heritage Rd. (LOS F in the AM and PM peak hours)
9. Heritage Rd./SR-905 WB Ramps (LOS E in the AM peak hour and LOS F in the PM peak hour)
10. Heritage Rd./SR-905 EB Ramps (LOS F in the AM and PM peak hours)
11. Heritage Rd./Airway Rd. (LOS F in the AM and PM peak hours)
12. Otay Mesa Rd./Cactus Rd. (LOS F in the AM and PM peak hours)
13. Airway Rd./Cactus Rd. (LOS F in the AM and PM peak hours)
14. Siempre Viva Rd./Cactus Rd. (LOS F in the PM peak hour)
15. Otay Mesa Rd./Britannia Blvd. (LOS F in the AM and PM peak hours)
16. Britannia Blvd./SR-905 WB Ramps (LOS F in the AM and PM peak hours)
17. Britannia Blvd./SR-905 EB Ramps (LOS F in the AM and PM peak hours)
18. Britannia Blvd./Airway Rd. (LOS F in the AM and PM peak hours)
19. Siempre Viva Rd./Britannia Blvd. (LOS F in the AM and PM peak hours)
20. Otay Mesa Rd./La Media Rd. (LOS F in the AM and PM peak hours)
21. La Media Rd./SR-905 WB Ramps (LOS F in the AM and PM peak hours)
22. La Media Rd./SR-905 EB Ramps (LOS F in the AM and PM peak hours)
23. La Media Rd./Airway Rd. (LOS F in the AM and PM peak hours)
24. La Media Rd./Siempre Viva Rd. (LOS F in the AM and PM peak hours)
25. Lone Star Rd./SR-125 SB Off Ramp (LOS E in the AM peak hour and LOS F in the PM peak hours)
26. Lone Star Rd./SR-125 NB On Ramp (LOS A with excessive queues blocking the intersection in the AM peak hour and LOS F in the PM peak hour)
27. Lone Star Rd./Piper Ranch Rd. (LOS A with excessive queues blocking the intersection in the PM peak hour)
28. Otay Mesa Rd./Piper Ranch Rd. (LOS F in the AM and PM peak hours)
29. Otay Mesa Rd./SR-125 SB Off Ramp (LOS F in the AM peak hour and LOS B with excessive queues blocking the intersection in the PM peak hour)
30. Otay Mesa Rd./Harvest Rd. (LOS F in the PM peak hour)
31. Siempre Viva Rd./Otay Center Dr. (LOS F in the AM and PM peak hours)

32. Siempre Viva Rd./SR-905 SB to EB Ramp (LOS C with excessive queues blocking the intersection in the AM peak hour and LOS F in the PM peak hour)
33. Siempre Viva Rd./SR-905 SB to WB Ramp (LOS F in the AM and PM peak hours)
34. Siempre Viva Rd./SR-905 NB Ramps (LOS D with excessive queues blocking the intersection in the AM peak hour and LOS F in the PM peak hour)
35. Siempre Viva Rd./Paseo de las Americas (LOS F in the AM and PM peak hours)
36. Ocean View Hills Pkwy./Del Sol Blvd. (LOS E in the AM and PM peak hours)
37. Ocean View Hills Pkwy./Street A (LOS E in the PM peak hour)
38. Old Otay Mesa Rd./Beyer Blvd. (LOS F in the AM and PM peak hours)
39. Otay Mesa Rd./Corporate Center Dr. (LOS F in the AM and PM peak hours)
40. Otay Mesa Rd./Innovative Dr. (LOS F in the AM and PM peak hours)
41. Harvest Rd./Airway Rd. (LOS F in the AM peak hour)
42. Harvest Rd./Siempre Viva Rd. (LOS E in the AM and PM peak hours)
43. Otay Mesa Rd./Sanyo Ave. (LOS F in the AM and PM peak hours)
44. Airway Rd./Sanyo Ave. (LOS F in the AM and PM peak hours)
45. Paseo de las Americas/Heinrich Hertz Dr. (LOS F in the AM and PM peak hours)
46. Paseo de las Americas/Marconi Dr. (LOS F in the AM and PM peak hours)
47. Heritage Rd./Otay Valley Rd. (LOS F in the AM and PM peak hours)
48. Aviator Rd./La Media Rd. (LOS F in the AM peak hour)
49. Otay Valley Rd./Avenida de las Vistas (LOS F in the AM and PM peak hours)

The CPU impacts at these 49 intersections would be significant.

Freeway Segments

Under the Horizon Year Plus CPU conditions, the following five segments of SR-905 would be expected to operate at unacceptable levels (Table 5.12-7):

1. SR-905, between Picador Boulevard and I-805 (LOS F0)
2. SR-905, between I-805 and Caliente Avenue (LOS F2)
3. SR-905, between Caliente Avenue and Heritage Drive (LOS F3)
4. SR-905, between Heritage Drive and Britannia Boulevard (LOS F1)
5. SR-905, between Britannia Boulevard and La Media Road (LOS F0)

While the SR-905 has been planned to allow future HOV lanes, such a project has not been funded and, therefore, is not included in the analysis. The CPU impacts to these five SR-905 segments would be significant.

TABLE 5.12-6
CPU HORIZON YEAR INTERSECTION LEVELS OF SERVICE

		Horizon Year Plus CPU					Horizon Year Plus CPU With Mitigation				
		AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour		Significant After
	Intersection	CD	LOS	CD	LOS	Mitigation	CD	LOS	CD	LOS	Mitigation?
1	Palm Ave./I-805 SB Ramps	48.9	D	51.3	D	Revise SB-LTR to LT; +1 SB-R*	24.8	C	35.7	D	-
2	Palm Ave./I-805 NB Ramps	116.1	**F**	122.6	**F**	+1 dedicated NB-L; +1EB-T; +1EB-R; +1WB-T; +1WB-R	4.6	A	5.5	A	No
3	Palm Ave./Dennery Rd.	33.5	C	67.2	**E**	-	-	-	-	-	**Yes**
4	Otay Mesa Rd./Caliente Ave.	263.5	**F**	146.0	**F**	+1 dedicated NB-R	205.9	**F**	87.2	**F**	**Yes**
5	Caliente Ave./SR-905 WB Ramps	83.1	**F**	43.2	**D**[1]	+1 NB-L; +1 dedicated SB-R	34.0	**C**[1]	34.0	**C**[1]	**Yes**
6	Caliente Ave./SR-905 EB Ramps	165.7	**F**	150.5	**F**	+1 dedicated NB-R; +1SB-L; +1 dedicated EB-R	55.0	**E**	70.2	**E**	**Yes**
7	Caliente Ave./Airway Rd.	228.5	**F**	223.0	**F**	+1 dedicated NB-L; +1 dedicated EB-R	143.0	**F**	200.5	**F**	**Yes**
8	Caliente Ave./Beyer Blvd.	252.0	**F**	429.8	**F**	+2 dedicated SB-R; +1 dedicated EB-R	212.7	**F**	122.4	**F**	**Yes**
9	Otay Mesa Rd./Heritage Rd.	367.5	**F**	257.4	**F**	+1 dedicated NB-R; +1 dedicated SB-R; +1WB-R	272.0	**F**	161.2	**F**	**Yes**
10	Heritage Rd./SR-905 WB Ramps	69.9	**E**	81.1	**F**	+2 dedicated NB-R	15.9	**B**[1]	28.4	**C**[1]	**Yes**
11	Heritage Rd./SR-905 EB Ramps	113.0	**F**	86.4	**F**	+1 dedicated NB-L; +1 dedicated WB-R	39.5	**D**[1]	25.5	**C**[1]	**Yes**
12	Heritage Rd./Airway Rd.	162.7	**F**	402.8	**F**	+2 dedicated WB-R	144.5	**F**	88.3	**F**	**Yes**
13	Heritage Rd./Siempre Viva Rd.	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	N/A	-
14	Otay Mesa Rd./Cactus Rd.	437.9	**F**	290.5	**F**	+2 dedicated EB-R; +1 dedicated WB-R	139.6	**F**	199.7	**F**	**Yes**
15	Airway Rd./Cactus Rd.	361.5	**F**	437.7	**F**	+1 dedicated NB-R; +1 dedicated SB-R; +1 dedicated EB-R; +2 dedicated WB-R	188.6	**F**	306.2	**F**	**Yes**
16	Siempre Viva Rd./Cactus Rd.	48.7	**D**	127.7	**F**	+1 dedicated NB-R	47.6	D	117.3	**F**	**Yes**
17	Otay Mesa Rd./Britannia Blvd.	108.5	**F**	117.2	**F**	+1 dedicated EB-R; +1 dedicated WB-R	63.1	**E**	47.5	D	**Yes**
18	Britannia Blvd./SR-905 WB Ramps	240.5	**F**	577.4	**F**	Restripe 3rd SB-T to SB-TR; +1 dedicated SB-R; Restripe WB-T to LTR	65.0	**E**	547.1	**F**	**Yes**
19	Britannia Blvd./SR-905 EB Ramps	353.3	**F**	235.1	**F**	+2 dedicated NB-R	305.9	**F**	67.1	**E**	**Yes**
20	Britannia Blvd./Airway Rd.	618.2	**F**	615.8	**F**	+1 dedicated NB-R; +2 dedicated SB-R; +1 dedicated EB-R; +2 dedicated WB-R	184.9	**F**	241.1	**F**	**Yes**
21	Siempre Viva Rd./Britannia Blvd.	363.3	**F**	362.8	**F**	+1 dedicated NB-R; +2 dedicated SB-R; +1 dedicated EB-R; +2 dedicated WB-R	177.5	**F**	143.2	**F**	**Yes**

	Intersection	Horizon Year Plus CPU				Mitigation	Horizon Year Plus CPU With Mitigation				Significant After Mitigation?
		AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour		
		CD	LOS	CD	LOS		CD	LOS	CD	LOS	
22	Otay Mesa Rd./La Media Rd.	457.1	**F**	443.8	**F**	+2 dedicated NB-R; +2 dedicated SB-R; +2 dedicated EB-R; +2 dedicated WB-R	131.9	**F**	126.2	**F**	**Yes**
23	La Media Rd./SR-905 WB Ramps	266.1	**F**	227.2	**F**	+1 NB-T; +1 dedicated SB-L	129.8	**F**	112.7	**F**	**Yes**
24	La Media Rd./SR-905 EB Ramps	234.7	**F**	84.7	**F**	+1 SB-T	162.2	**F**	48.5	**D**[1]	**Yes**
25	La Media Rd./Airway Rd.	496.6	**F**	507.9	**F**	+1 dedicated NB-R; +2 dedicated SB-R; +1 dedicated EB-R; +2 dedicated WB-R	182.5	**F**	212.5	**F**	**Yes**
26	La Media Rd./Siempre Viva Rd.	244.0	**F**	112.1	**F**	Restripe SB to 1T and 2SB-R; +2 dedicated WB-R	81.6	**F**	37.1	D	**Yes**
27	La Media Rd./Lone Star Rd.	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	N/A	**-**
28	Lone Star Rd./SR-125 SB Off Ramp	63.6	**E**	96.8	**F**	-	-	-	-	-	**Yes**
29	Lone Star Rd./SR-125 NB On Ramp	2.1	A[1]	147.8	**F**	-	-	-	-	-	**Yes**
30	Lone Star Rd./Piper Ranch Rd.	8.1	A	9.3	**A**[1]	-	-	-	-	-	**Yes**
31	Otay Mesa Rd./Piper Ranch Rd.	129.2	**F**	166.2	**F**	+1 dedicated NB-R; +2 dedicated SB-R; +1 dedicated EB-R; +1 dedicated WB-R	44.6	D	47.5	D	No
32	Otay Mesa Rd./SR-125 SB Off Ramp	82.9	**F**	13.0	**B**[1]	Restripe SB to SB-L, SB-T/L, SB-R	30.4	C	11.0	**B**[1]	**Yes**
33	Otay Mesa Rd./SR-125 NB On Ramp	4.8	A	22.0	C	-	-	-	-	-	**-**
34	Otay Mesa Rd./Harvest Rd.	37.9	D	133.7	**F**	+1 NB-L; +1 dedicated EB-R	11.8	B	38.9	**D**[1]	**Yes**
35	Siempre Viva Rd./Otay Center Dr.	276.0	**F**	213.0	**F**	+1 dedicated NB-R; +1 SB-L; +1 dedicated SB-R; +1 EB-L; +1 dedicated EB-R; +1 WB-L; +1 dedicated WB-R	83.0	**F**	85.4	**F**	**Yes**
36	Siempre Viva Rd./SR-905 SB to EB Ramp	29.0	**C**[1]	146.2	**F**	-	-	-	-	-	**Yes**
36A	Siempre Viva Rd./SR-905 SB to WB Ramp	2,641[2]	**F**[1]	205.7[2]	**F**	Signalize; +1 SB-R	382.0	**F**	16.3	**B**[1]	**Yes**
37	Siempre Viva Rd./SR-905 NB Ramps	47.2	**D**[1]	262.7	**F**	+1 WB-R	39.3	**D**[1]	250.4	**F**	**Yes**
38	Siempre Viva Rd./Paseo de las Americas	188.8	**F**	367.1	**F**	NB restriped to L, LT, R; SB restriped to L, T, 2R; +1 dedicated WB-R	78.8	**E**	159.5	**F**	**Yes**
39	Dennery Rd./Del Sol Blvd.	49.3	D	49.4	D	-	-	-	-	-	**-**

	Intersection	Horizon Year Plus CPU				Mitigation	Horizon Year Plus CPU With Mitigation				Significant After Mitigation?
		AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour		
		CD	LOS	CD	LOS		CD	LOS	CD	LOS	
40	Ocean View Hills Pkwy./Del Sol Blvd.	67.8	**E**	67.3	**E**	+1 dedicated SB-R; restripe EB to L-LT-R	50.5	D	53.3	D	No
41	Ocean View Hills Pkwy./Street A	48.2	D	57.9	**E**	+1 NB-L; +1 dedicated EB-R	35.5	D	34.6	C	No
42	Old Otay Mesa Rd./Beyer Blvd.	381.2	**F**	396.5	**F**	+1 dedicated NB-R; +1 dedicated SB-R	194.3	**F**	181.8	**F**	**Yes**
43	Otay Mesa Rd./Corporate Center Dr.	119.3	**F**	184.3	**F**	Restripe SB to 2L-TRF-R; +1 dedicated EB-R	78.6	**E**	140.6	**F**	**Yes**
44	Otay Mesa Rd./Innovative Dr.	114.4	**F**	108.9	**F**	Restripe SB to 2L-TRF-R	113.7	**F**	89.8	**F**	**Yes**
45	Harvest Rd./Airway Rd.	116.7	**F**	13.8	B	+1 dedicated EB-R	42.5	D	13.5	B	No
46	Harvest Rd./Siempre Viva Rd.	76.6	**E**	69.2	**E**	+1 SB-L; +1 dedicated SB-R; +1 dedicated WB-R	28.7	C	51.5	D	No
47	Otay Mesa Rd./Sanyo Ave.	263.3	**F**	276.6	**F**	+1 NB-L; +1 dedicated NB-R; +2 dedicated EB-R; +1 dedicated WB-R	106.7	**F**	89.0	**F**	**Yes**
48	Airway Rd./Sanyo Ave.	225.6	**F**	229.8	**F**	+1 NB-L; +1 dedicated NB-R; +1 SB-L; +2 dedicated SB-R; +2 dedicated EB-R; +1 dedicated WB-R	49.7	D	38.6	D	No
49	Paseo de las Americas/Heinrich Hertz Dr.	988.3[3]	**F**	244.6[3]	**F**	Signalize; +1 NB-L	8.9	A	13.0	B	No
50	Paseo de las Americas/Marconi Dr.	869.6[4]	**F**	108.0[4]	**F**	Signalize; +1 SB-L	11.5	B	13.4	B	No
51	Heritage Rd./Otay Valley Rd.	516.4	**F**	837.9	**F**	+1 dedicated NB-R; +2 dedicated SB-R; +1 EB-L; +1 dedicated EB-R; +1 WB-L; +1 dedicated WB-R	178.7	**F**	382.7	**F**	**Yes**

		Horizon Year Plus CPU					Horizon Year Plus CPU With Mitigation				
		AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour		Significant After
	Intersection	CD	LOS	CD	LOS	Mitigation	CD	LOS	CD	LOS	Mitigation?
52	Aviator Rd./La Media Rd.	105.1	**F**	38.0	D	+1 dedicated SB-R	27.7	C	18.3	B	No
53	Otay Valley Rd./Avenida de las Vistas	764.4	**F**	298.6	**F**	-	-	-	-	-	**Yes**

SOURCE: Appendix J (Urban Systems Associates, Inc. 2012).
NOTE: Control delay results should be considered unreliable at delay volumes higher than two times the LOS E delay of 80.0 seconds.

*This is a suggested improvement and is not mitigation for a CPU impact.

[1]Vehicles queues may extend through this intersection from a downstream intersection, resulting in degraded LOS from vehicles blocking this intersection.

[2]Unsignalized: SB to WB right turn at LOS F (AM and PM peak hours)

[3]Unsignalized: eastbound left turn at LOS F (AM Peak Hour); eastbound left and right turns at LOS F (PM Peak Hour).

[4]Unsignalized: westbound left turn at LOS F (AM and PM Peak Hours); westbound right turn at LOS F (PM Peak Hour).

Bold indicates a significant impact.

Legend
CD = Control Delay
LOS = Level of Service
SB=Southbound
NB=Northbound
EB=Eastbound
WB=Westbound
L = left turn lane
T = through lane
R = right turn lane
S = shared lane
Dedicated= change from a shared lane to an exclusive dedicated lane

TABLE 5.12-7
CPU HORIZON YEAR FREEWAY SEGMENT LEVELS OF SERVICE

Segment		Lanes (1-Way)	Capacity	Horizon Year ADT	Peak Volume	V/C	LOS	Mitigation (with HOV lane)[1]	
								V/C	LOS
SR-905	Picador Blvd. to I-805	2 + AUX	6,500	128,500	6,853	1.05	**F0**	0.83	D
	I-805 to Caliente Ave.	3 + CL	8,550	221,000	11,787	1.38	**F2**	1.13	**F0**
	Caliente Ave. to Heritage Rd.	3	7,050	196,000	10,453	1.48	**F3**	1.18	**F0**
	Heritage Rd. to Britannia Blvd.	3	7,050	173,000	9,227	1.31	**F1**	1.04	**F0**
	Britannia Blvd. to La Media Rd.	3	7,050	154,000	8,213	1.16	**F0**	0.92	D
	La Media Rd. to SR-125	3	7,050	103,500	5,520	0.78	C	-	-
	SR-125 to Siempre Viva Rd.	3	7,050	99,000	5,280	0.75	C	-	-
	Siempre Viva Rd. to Border	3	7,050	64,500	3,440	0.49	B	-	-
I-805	Main St. to Palm Ave.	4+AUX+2HOV	14,400	248,000	13,227	0.92	D	-	-
	Palm Ave. to SR-905	4+AUX+2HOV	14,400	222,000	11,840	0.82	D	-	-
	SR-905 to I-5	4	9,400	122,000	6,507	0.69	C	-	-
	I-5 to Border	6	14,100	135,500	7,227	0.51	B	-	-
SR-125	Birch Rd. to Lone Star Rd.	4 (Toll)	9,400	155,500	8,293	0.88	D	-	-
	Lone Star Rd. to SR-905	4 (Toll)	9,400	115,500	6,160	0.66	C	-	-
SR–11	SR-905 to Enrico Fermi Dr.	2	4,700	47,000	2,507	0.53	B	-	-
	Enrico Fermi Dr. to Siempre Viva Rd	2	4,700	24,500	1,307	0.28	A	-	-
	Siempre Viva Rd. to Border	2	4,700	39,500	2,107	0.45	B	-	-

SOURCE: Appendix J (Urban Systems Associates, Inc. 2012)
[1]SR-905 would include one HOV lane in each direction. Note that the addition of 1 HOV lane in each direction to SR-905 is not in the RTP and is not funded. The addition of 2 HOV lanes to I-805 is in the RTP and is funded, and is included in the Horizon Year baseline conditions.

ADT = average daily traffic
V/C = volume-to-capacity ratio
LOS = Level of service
Bold indicates a significant impact.

Freeway Ramp Metering

As shown in Table 5.12-8, 11 of the freeway ramp metering locations would be expected to experience delays in excess of 15 minutes in the Horizon Year Plus CPU condition. Out of these locations, the following five ramp meter locations would also experience a downstream freeway operation of unacceptable LOS E or F in the Horizon Year Plus CPU condition:

1. SR-905/Caliente Avenue WB on-ramp (AM and PM peak hours)
2. SR-905/Heritage Road WB on-ramp (PM peak hour)
3. SR-905/Britannia Boulevard WB on-ramp (AM and PM peak hours)
4. SR-905/Britannia Boulevard EB on-ramp (PM peak hour)
5. SR-905/La Media Road WB on-ramp (AM and PM peak hours)

The CPU impacts at these five ramp meter locations would be significant.

5.12.3.2 Significance of Impacts

a. Roadway Segments

A total of 24 roadway segments under the Horizon Year Plus CPU condition would be expected to operate at unacceptable LOS. Therefore, the CPU would have a significant impact at all of these 24 roadway segment locations.

b. Intersections

A total of 49 intersections would be expected to operate at unacceptable levels under the Horizon Year Plus CPU condition. Therefore, the CPU would have a significant impact at all 49 of these intersections.

c. Freeway Segments

With the planned and funded I-805 improvements, all I-805 freeway segments would be expected to operate at an acceptable LOS in the Horizon Year Plus CPU condition and therefore impacts would be less than significant. Five SR-905 freeway segments would be expected to operate at unacceptable levels in the Horizon Year Plus CPU condition. Thus, the CPU impact at these five SR-905 freeway segments would be significant.

d. Freeway Ramp Metering

Five SR-905 freeway ramps would be expected to experience delays over 15 minutes with downstream freeway operations at unacceptable levels in the Horizon Year Plus CPU condition. The CPU impact at these five freeway ramps would be significant.

TABLE 5.12-8
CPU HORIZON YEAR RAMP METER OPERATIONS

Peak Hour	Location	Demand[1] (Veh/Hr)	Meter Rate[2] (Veh/Hr)	Excess Demand	Queue (Feet)	Delay[3] (Min)	Exceeds 15-Minute Delay?	Significant? (Exceeds 15 minutes and downstream freeway is LOS E or F)
AM	I-805/Palm Avenue NB (from WB)	1,280	960	320	8,000	20.0	Yes	No[4]
PM	I-805/Palm Avenue NB (from WB)	1,380	960	420	10,500	26.3	Yes	No[4]
AM	I-805/Palm Avenue NB (from EB)	655	960	None	None	None	No	No
PM	I-805/Palm Avenue NB (from EB)	540	960	None	None	None	No	No
AM	I-805/Palm Avenue SB	455	960	None	None	None	No	No
PM	I-805/Palm Avenue SB	645	960	None	None	None	No	No
AM	SR-905/Caliente Avenue WB	1,860	960	900	22,500	56.3	Yes	**Yes**
PM	SR-905/Caliente Avenue WB	1,550	960	590	14,750	36.9	Yes	**Yes**
AM	SR-905/Caliente Avenue EB	400	960	None	None	None	No	No
PM	SR-905/Caliente Avenue EB	400	960	None	None	None	No	No
AM	SR-905/Heritage Road WB	1,135	960	175	4,375	10.9	Yes	No
PM	SR-905/Heritage Road WB	2,550	960	1,590	39,750	99.4	Yes	**Yes**
AM	SR-905/Heritage Road EB	360	960	None	None	None	No	No
PM	SR-905/Heritage Road EB	800	960	None	None	None	No	No
AM	SR-905/Britannia Blvd. WB	1,350	960	390	9,750	24.4	Yes	**Yes**
PM	SR-905/Britannia Blvd. WB	3,355	960	2,395	59,875	149.1	Yes	**Yes**
AM	SR-905/Britannia Blvd. EB	710	960	None	None	None	No	No
PM	SR-905/Britannia Blvd. EB	1,400	960	440	11,000	27.5	Yes	**Yes**
AM	SR-905/La Media Road WB	2,050	960	1,090	27,250	68.1	Yes	**Yes**
PM	SR-905/La Media Road WB	3,025	960	2,065	51,625	129.0	Yes	**Yes**
AM	SR-905/La Media Road EB	1,000	960	40	1,000	2.5	No	No
PM	SR-905/La Media Road EB	1,950	960	990	24,750	61.8	Yes	No[4]
AM	SR-905/Siempre Viva Rd. NB	1,185	960	225	5,625	14.1	No	No
PM	SR-905/Siempre Viva Rd. NB	3,510	960	2,550	63,750	159.4	Yes	No[4]
AM	SR-905/Siempre Viva Rd. SB	750	960	None	None	None	No	No
PM	SR-905/Siempre Viva Rd. SB	1,670	960	710	17,750	44.4	Yes	No[4]
AM	SR-125/Otay Mesa Rd. NB	1,680	960	720	24,000	45.0	Yes	No[4]
PM	SR-125/Otay Mesa Rd. NB	2,455	960	1,495	37,375	93.4	Yes	No[4]
AM	SR-125/Lone Star Rd. NB	850	960	None	None	None	No	No
PM	SR-125/Lone Star Rd. NB	3,615	960	2,655	66,375	166.0	Yes	No[4]

SOURCE: Appendix J (Urban Systems Associates, Inc. 2012).
Bold indicates a significant impact.
[1]Total hourly volume entering from both directions.
[2]Most restrictive meter rate used, per Caltrans. This Veh/Hr assumes 2 lanes and 2 cars per green light on a 15-second cycle.
[3]$Delay = \frac{Excess\ Demand\ (vehicles)}{Meter\ Rate\ (vehicles\ per\ hour)}\ x\ 60\ min.per\ hour$
[4]While the delay exceeds 15 minutes, the downstream freeway operates at acceptable LOS. Thus, this impact is considered less than significant.

5.12.3.3 Mitigation Framework

At the program-level, impacts shall be reduced through the proposed classifications of roadways and identification of necessary roadway, intersection and freeway improvements. Mitigation or construction of these improvements shall be carried out at the project-level via the Public Facilities Financing Plan and future development projects. Funding shall be through construction by individual development projects, collection of FBA fees, fair share contributions to be determined at the project-level, and potentially other sources.

The following standards apply to the area designated for commercial and industrial uses as shown in Figure 3-9 (Project Description) within OM-CPIOZ. Future commercial and industrial development applications for properties identified on Figure 3-9 that are consistent with the CPU, the based zone regulations, and these supplemental regulations will be processed ministerially (CPIOZ A) in accordance with the procedures of the CPIOZ (Municipal Code Chapter 13, Article 2, Division 14). Development that complies with all of the following shall be processed as CPIOZ A: Development that includes construction of the abutting street(s) to the street classification identified in the Mobility Element of the Otay Mesa Community Plan and intersection configurations identified in Figures 5.12-4a-g; and development projects that can provide documentation from a California Registered Traffic Engineer, confirmed and accepted by the City Engineer, stating that the proposed project's traffic volumes are based on the City's trip generation rates and are less than 1,000 ADTs.

Development proposals that do not comply with the supplemental regulations for CPIOZ Type A and the regulations of the underlying zone shall apply for a Process 3 CPIOZ Type B permit. Applications for a Process 3 CPIOZ Type B permit shall meet the purpose and intent of the regulations of the underlying zone and the supplemental regulations. Deviations from these regulations may be granted by the City Manager in accordance with the procedures of the CPIOZ (Municipal Code Section 132.1403).

a. Roadway Segments

Even with incorporation of the recommended street classifications in Table 5.12-4 in the CPU, Public Facilities Financing Plan, and future project development review and (ministerial) and discretionary review through the CPIOZ~~the proposed classifications~~, 24 roadway segments would operate unacceptably in the Horizon Year Plus CPU condition. The TIA identified additional potential improvement measures that are not recommended as part of the CPU and are not included as part of the project. The reasons for not recommending the improvements ~~are detailed in the Findings and the Statement of Overriding Considerations~~include various factors such as adjacency to environmentally sensitive land and/or steep hillsides, existing development conflicts, and/or multi-modal and ~~urdan~~urban design context. The impacts are considered significant and ~~unavoidable~~unmitigated. At the project-level, partial mitigation may be possible in the form of transportation demand management measures that encourage carpooling and other alternate means of transportation. At the time future subsequent development projects are proposed, project-specific traffic analyses would contain detailed recommendations. All project-specific mitigation for direct impacts shall be implemented prior to the issuance of Certificate of Occupancy in order to provide mitigation at the time of impact.

The 24 roadway segments that would operate unacceptably in the Horizon Year plus CPU Condition are listed below.

1. Otay Mesa Road, Caliente Ave. to Corporate Center Dr.
2. Otay Mesa Road, Heritage Rd. to Cactus Rd.
3. Airway Road, Caliente Ave. to Heritage Rd.
4. Airway Road, Heritage Rd. to Cactus Rd.
5. Siempre Viva Road, Otay Center Dr. to SR-905
6. Siempre Viva Road, SR-905 to Paseo de las Americas
7. Caliente Avenue, Airway Rd. to Beyer Blvd.
8. Caliente Avenue, Beyer Blvd. to Siempre Viva Rd.
9. Heritage Road/Otay Valley Road, Main St. to Avenida de Las Vistas
10. Heritage Road/Otay Valley Road, Avenida de las Vistas to Datsun St.
11. Cactus Road, Otay Mesa Rd. to Airway Rd.
12. Cactus Road, Airway Rd. to Siempre Viva Rd.
13. Britannia Boulevard, SR-905 to Airway Rd.
14. La Media Road, SR-905 to Airway Rd.
15. Dennery Road, Black Coral Ln. to East End
16. Avenida de las Vistas, Vista Santo Domingo to Dennery Rd.
17. Del Sol Boulevard, Surf Crest Dr. to Riviera Pointe
18. Del Sol Boulevard, Riviera Pointe to Dennery Rd.
19. Old Otay Mesa Road, Crescent Bay Dr. to Beyer Blvd.
20. Camino Maquiladora, Heritage Rd. to Pacific Rim Ct.
21. Camino Maquiladora, Pacific Rim Ct. to Cactus Rd.
22. Progressive Avenue, Corporate Center Dr. to Innovative Dr.
23. Datsun Street, Innovative Dr. to Heritage Rd.
24. Exposition Way/Vista Santo Domingo, Avenida de las Vistas to Corporate Center Dr.

b. Intersections

A total of 49 intersections would be significantly impacted by the CPU. Even with incorporation of the recommended land configurations shown in Figure 5.12-4a-4g for the 53 intersections analyzed into the projects to be funded through the Public Facilities Financing Plan, and through future development projects (ministerial and discretionary through the CPIOZ~~With mitigation measures~~, a total of 39 intersections would continue to be significantly impacted. The TIA identified further potential improvement measures such as additional intersection turning movement lanes that are not recommended as part of the CPU and are not included as part of the project. The reasons for not recommending the improvements include considerations such as adjacency to environmentally sensitive land, steep hillsides, routes to schools, and multi-modal and urban design context, or because additional study would be required in order to make additional recommendations~~are detailed in the Findings and Statement of Overriding Considerations~~. At the project-level, partial mitigation may be possible in the form of transportation demand management measures that encourage carpooling and other alternate means of transportation. At the time future ~~discretionary~~ subsequent development projects are proposed, project-specific traffic analyses would contain detailed recommendations. All project-specific mitigation for direct impacts shall be implemented prior to the issuance of Certificate of Occupancy in order to provide mitigation at the time of impact.

The impacts are considered significant and ~~unavoidable~~unmitigated. To reduce impacts the following mitigation shall be provided:

TRF-1: Intersections shall be improved per the intersection lane designations identified in Figures 5.12-4a-g.

c. Freeway Segments

While providing one HOV lane in each direction on the SR-905 would reduce impacts associated with buildout of the CPU, the additional lanes are not funded; therefore, impacts would remain significant and ~~unavoidable~~ unmitigated at the programmatic level. At the project-level, partial mitigation may be possible in the form of auxiliary lanes and/or transportation demand management measures that encourage carpooling and other alternate means of transportation. At the time future ~~discretionary~~ subsequent development projects are proposed, project-specific traffic analyses would contain detailed recommendations. All project-specific mitigation for direct impacts shall be implemented prior to the issuance of Certificate of Occupancy in order to provide mitigation at the time of impact.

d. Freeway Ramp Metering

Mitigation that would reduce freeway ramp metering impacts at the five significantly impacted SR-905 locations consists of adding a lane to the freeway on-ramp, auxiliary lanes, and/or implementation of transportation demand management (TDM) measures that encourage carpooling and other alternate means of transportation. At the time future ~~discretionary~~subsequent development projects are proposed, project-specific traffic analyses would contain detailed recommendations. All project-specific mitigation for direct impacts shall be implemented prior to the issuance of Certificate of Occupancy in order to provide mitigation at the time of impact.

Map Source: Urban Systems Associates, Inc. 2012

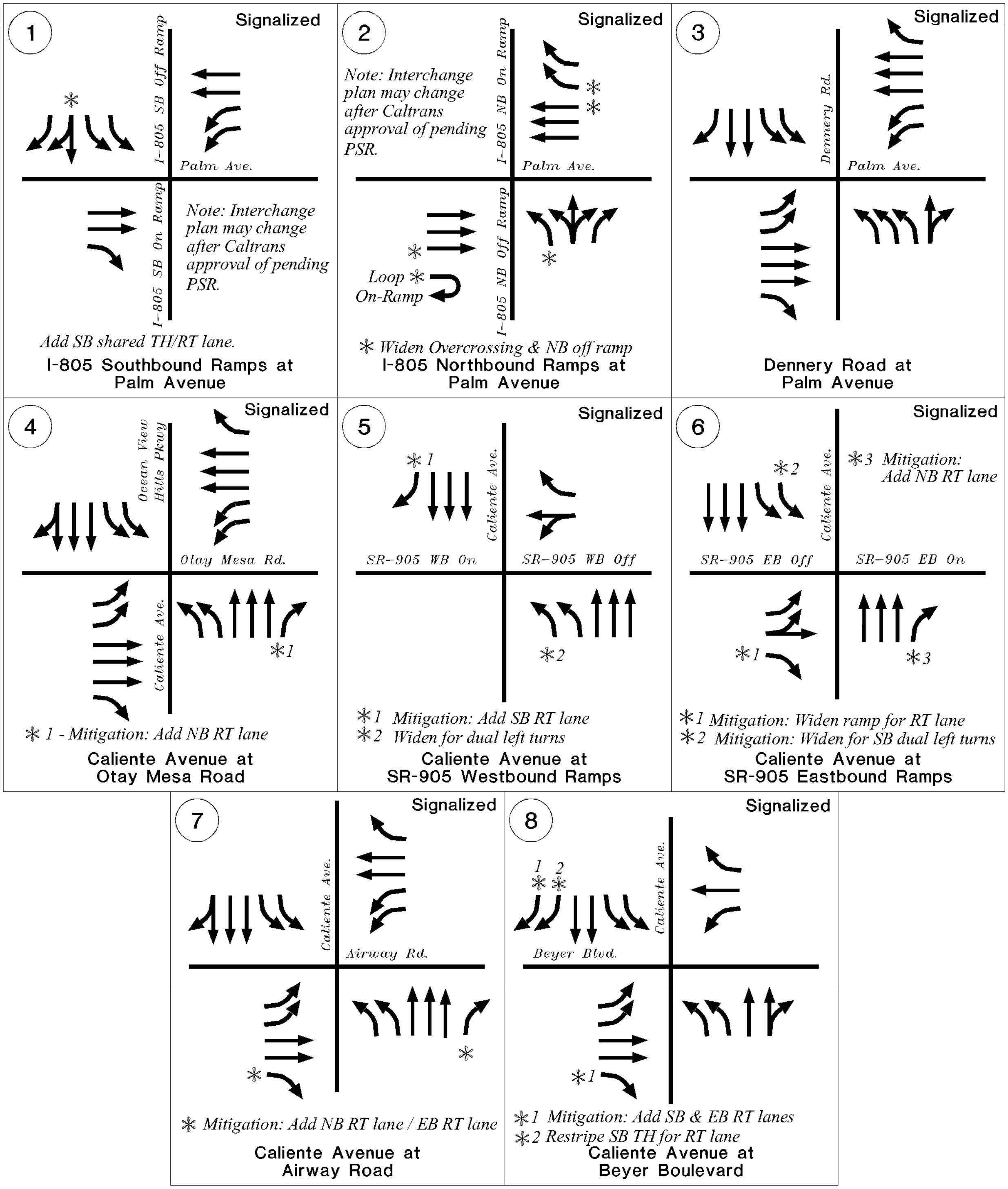


FIGURE 5.12-4a

Buildout Lane Configurations 1-8

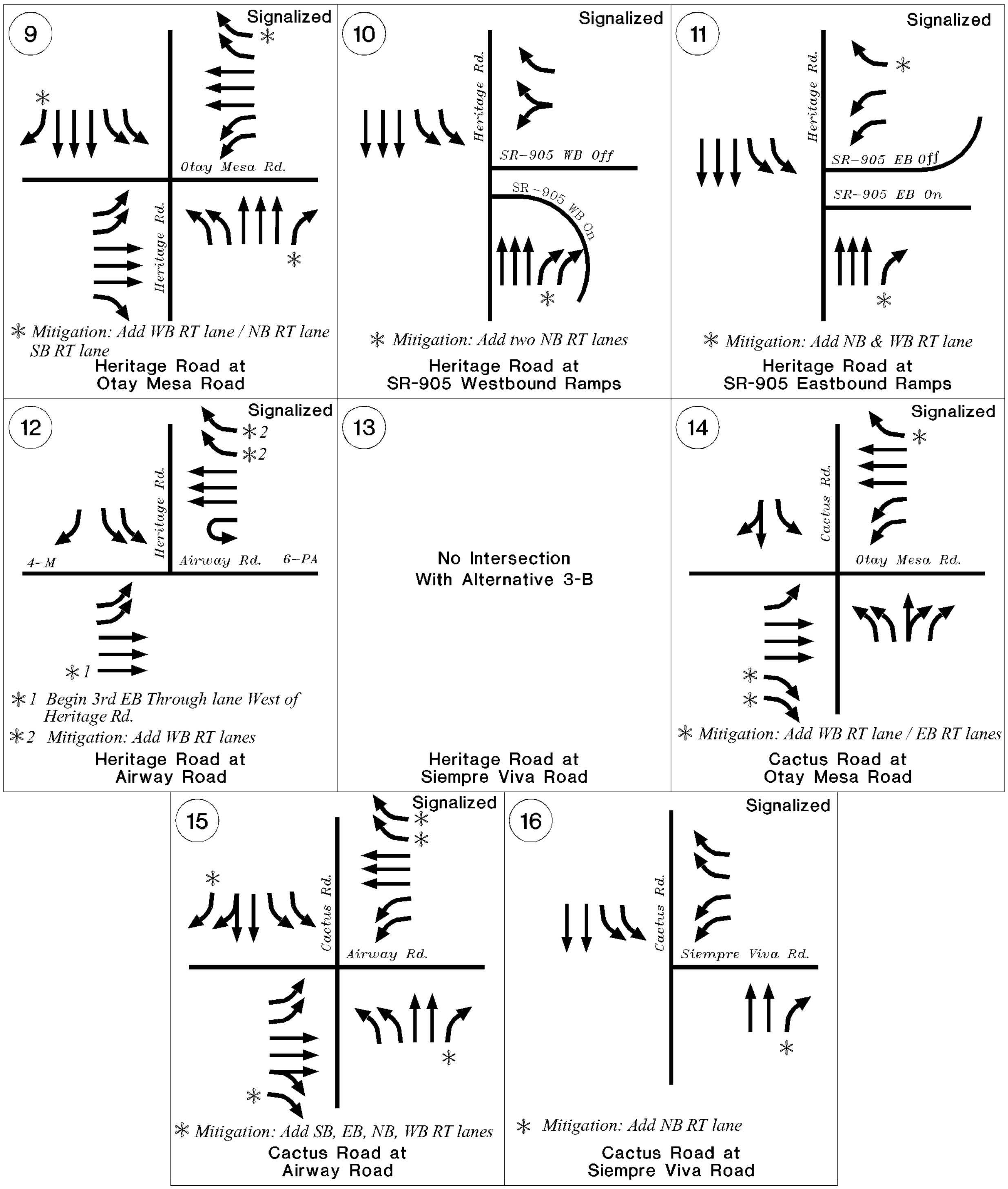


FIGURE 5.12-4b

Buildout Lane Configurations 9-16

Map Source: Urban Systems Associates, Inc. 2012

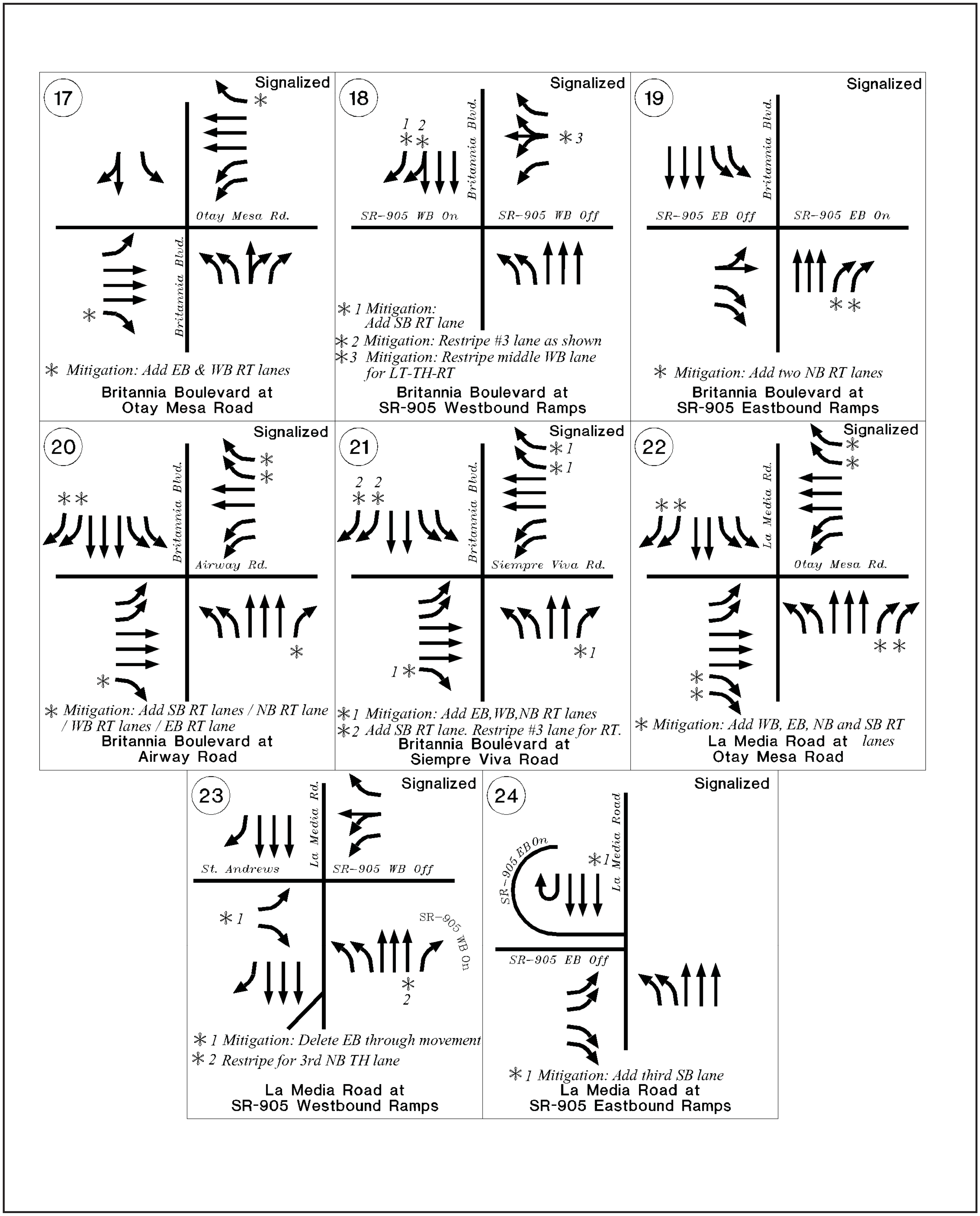


FIGURE 5.12-4c

Buildout Lane Configurations 17-24

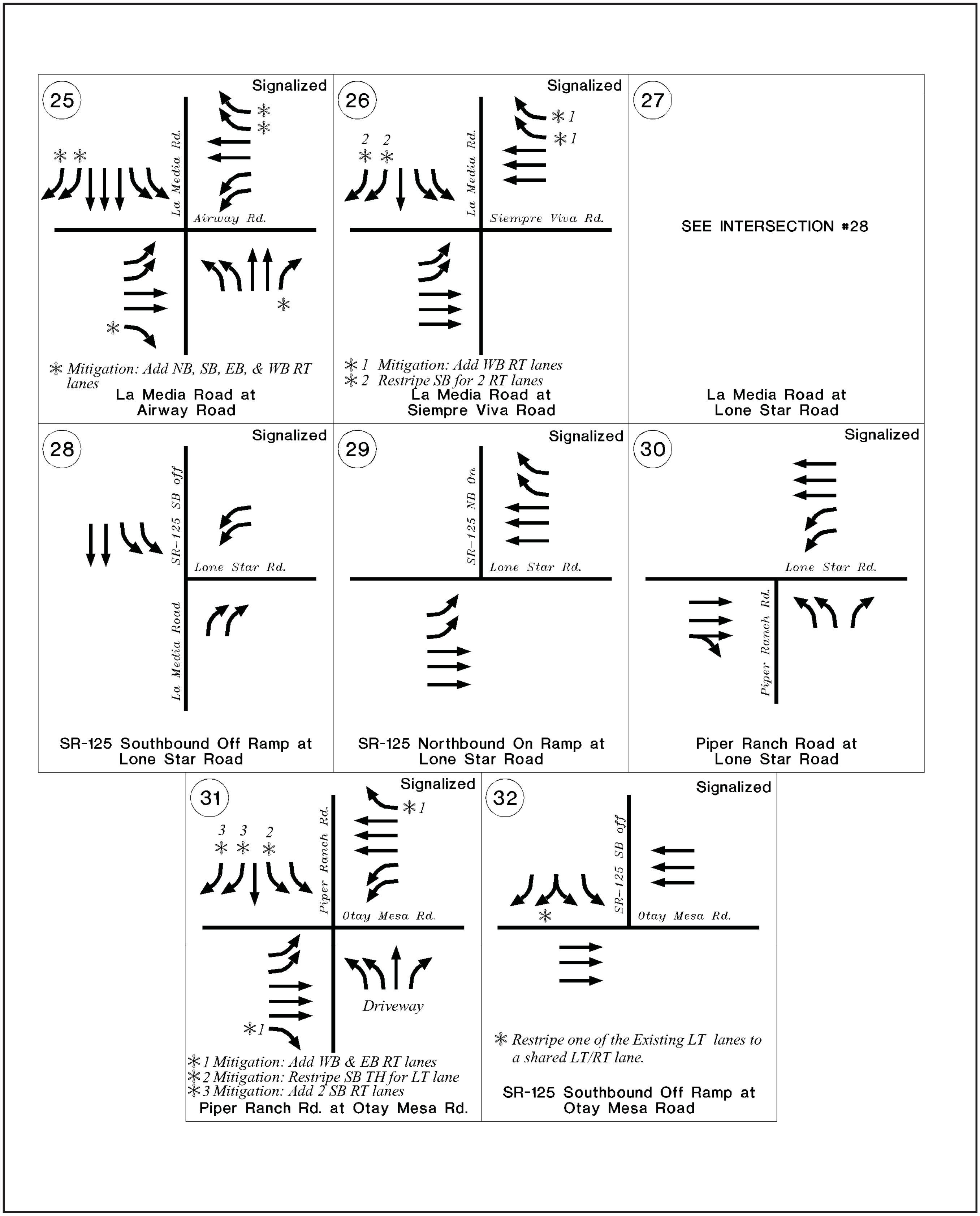


FIGURE 5.12-4d

Buildout Lane Configurations 25-32

Map Source: Urban Systems Associates, Inc. 2012

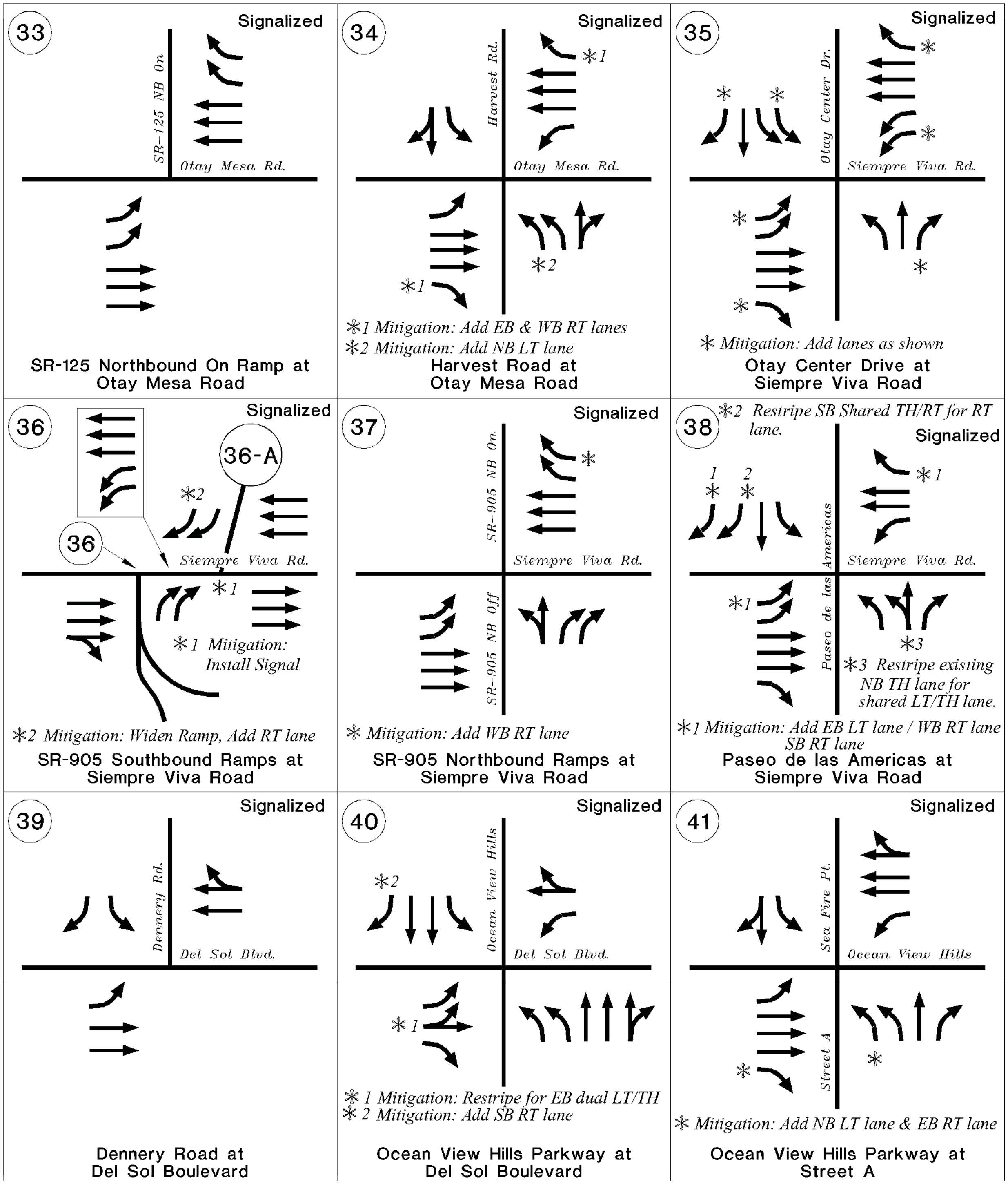


FIGURE 5.12-4e

Buildout Lane Configurations 33-41

Map Source: Urban Systems Associates, Inc. 2012

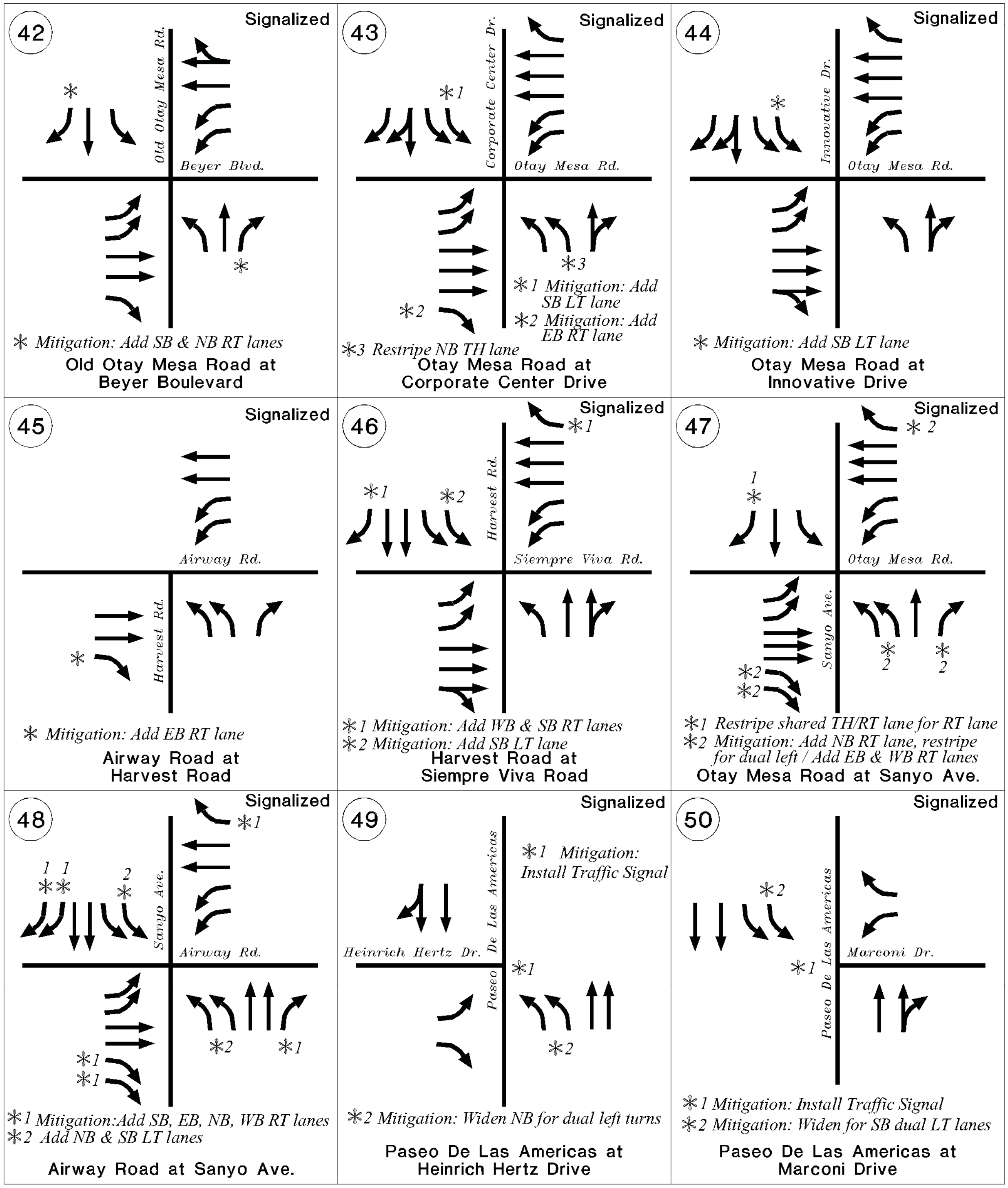


FIGURE 5.12-4f

Buildout Lane Configurations 42-50

Map Source: Urban Systems Associates, Inc. 2012

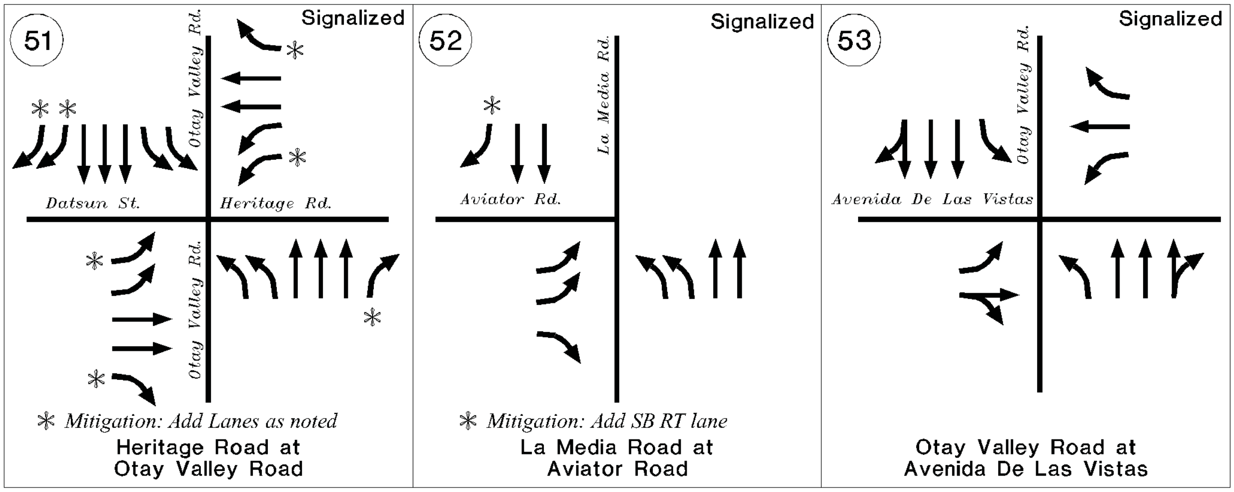


FIGURE 5.12-4g

Buildout Lane Configurations 51-53

However, due to the uncertainty associated with implementing freeway ramp improvements, and uncertainty related to implementation of TDM measures, the freeway ramp impacts associated with the CPU would remain significant and ~~unavoidable~~ unmitigated at the program-level.

5.12.3.4 Significance After Mitigation

a. Roadway Segments

Implementation of roadway segment improvements proposed as part of the CPU (see Section 5.12.3.1(a) above) would resolve several traffic impacts that would occur under the Horizon Year. However, 24 significant impacts as shown in Table 5.12-5 would remain ~~unavoidable~~unmitigated and would operate unacceptably in the Horizon Year plus CPU Condition as shown below~~.~~:

1. Otay Mesa Road, Caliente Ave. to Corporate Center Dr.
2. Otay Mesa Road, Heritage Rd. to Cactus Rd.
3. Airway Road, Caliente Ave. to Heritage Rd.
4. Airway Road, Heritage Rd. to Cactus Rd.
5. Siempre Viva Road, Otay Center Dr. to SR-905
6. Siempre Viva Road, SR-905 to Paseo de las Americas
7. Caliente Avenue, Airway Rd. to Beyer Blvd.
8. Caliente Avenue, Beyer Blvd. to Siempre Viva Rd.
9. Heritage Road/Otay Valley Road, Main St. to Avenida de Las Vistas
10. Heritage Road/Otay Valley Road, Avenida de las Vistas to Datsun St.
11. Cactus Road, Otay Mesa Rd. to Airway Rd.
12. Cactus Road, Airway Rd. to Siempre Viva Rd.
13. Britannia Boulevard, SR-905 to Airway Rd.
14. La Media Road, SR-905 to Airway Rd.
15. Dennery Road, Black Coral Ln. to East End
16. Avenida de las Vistas, Vista Santo Domingo to Dennery Rd.
17. Del Sol Boulevard, Surf Crest Dr. to Riviera Pointe
18. Del Sol Boulevard, Riviera Pointe to Dennery Rd.
19. Old Otay Mesa Road, Crescent Bay Dr. to Beyer Blvd.
20. Camino Maquiladora, Heritage Rd. to Pacific Rim Ct.
21. Camino Maquiladora, Pacific Rim Ct. to Cactus Rd.
22. Progressive Avenue, Corporate Center Dr. to Innovative Dr.
23. Datsun Street, Innovative Dr. to Heritage Rd.
24. Exposition Way/Vista Santo Domingo, Avenida de las Vistas to Corporate Center Dr.

b. Intersections

Implementation of intersection improvements identified in TRF-1 above, would occur in conjunction with future development within the CPU area and with implementation of Public Facilities Financing transportation projects. The improvements would reduce significant impacts to below a level of significance at the following ten intersections (see Table 5.12-6):

- Palm Avenue/I-805 NB Ramps
- Otay Mesa Road/Piper Ranch Road
- Ocean View Hills Parkway/Del Sol Boulevard
- Ocean View Hills Parkway/Street A
- Harvest Road/Airway Road
- Harvest Road/Siempre Viva Road
- Airway Road/Sanyo Avenue
- Paseo de las Americas/Heinrich Hertz Drive
- Paseo de las Americas/Marconi Drive
- Aviator Road/La Media Road

The remaining 39 intersections would continue to operate at unacceptable levels with the proposed mitigation. Additional intersection mitigation measures are not desirable and not recommended as discussed in the Findings and Statement of Overriding Considerations. Additional mitigation such as TDM measures may be identified in the future at the project-level. Thus, these impacts would remain significant and not fully mitigated at the program-level.

c. Freeway Segments

The CPU would significantly impact five segments of SR-905. Caltrans has designed the SR-905 to allow for the construction of HOV lanes, which would reduce the CPU impacts to below a level of significance at two of the five impacted freeway segments identified in Table 5.12-7. However, the addition of HOV lanes to SR-905 is not a funded or planned project at this time and improvements to these facilities cannot be guaranteed to be implemented by the City. Additional mitigation such as TDM measures may be identified in the future at the project-level. Thus, at the program-level, CPU impacts to the five SR-905 freeway segments would remain significant and unmitigated.

d. Freeway Ramp Metering

As discussed above under 5.12.3.3(d), due to the uncertainty associated with implementing freeway improvements, limitations on increasing ramp capacity, and uncertainty regarding implementation of TDM measures, the freeway ramp impacts associated with the CPU identified in Table 5.12-8 would remain significant and unmitigated at the program-level.

5.12.4 Issue 2: Traffic Hazards

Would the project result in an increase in traffic hazards for motor vehicles, bicyclists, or pedestrians?

5.12.4.1 Impacts

The CPU is intended to create a balanced and safe multi-modal transportation network. As a part of this effort, the residential and industrial interfaces have been reduced and designated truck routes have been established (refer to Figure 3-7) to avoid the potential transportation conflicts caused by large haul trucks on residential and other streets where pedestrian use is expected to be heavy. Where an interface of International Business and Trade and residential designations would be allowed, policies have been established to require a gradual transition between residential and industrial uses that would reduce traffic conflicts (see Section 5.1.4.1).

All roadway improvements that would occur as part of CPU implementation would be constructed to City standards, including standards for sight distance, turning radii, speed limits, etc., and to the satisfaction of the City Engineer. Therefore, implementation of the CPU would not result in an increase in traffic hazards for motor vehicles, bicyclists or pedestrians.

5.12.4.2 Significance of Impacts

All roadway improvements would be designed and constructed in accordance with the CPU Mobility Element roadway network satisfactory to the City Engineer. Additionally, the CPU includes policies that would reduce potential conflicts between vehicle, pedestrian, and bicyclists. Conformance to City design standards and CPU policies would reduce impacts associated with traffic hazards to motor vehicles, bicyclists, or pedestrians to below a level of significance.

5.12.4.3 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation is required.

5.12.4.4 Significance After Mitigation

Impacts would be less than significant.

5.12.5 Issue 3: Circulation and Access

Would the CPU create alterations to present circulation movements in the area including effects on existing public access points?

5.12.5.1 Impacts

As discussed in Section 5.12.3.1 above, the CPU proposes alterations to the existing circulation system through roadway reclassifications within the CPU area. Buildout of the CPU would result in increased circulation capacity and access for vehicles, bicycles, and pedestrians (see Figures 3-3). The existing Otay Mesa POE and Brown Field access would be maintained.

Temporary closures with detours may be required during street improvements and would be addressed through traffic control plans in accordance with City policy as construction plans for future projects are processed through the City. No existing public access points would be permanently closed as part of CPU implementation.

5.12.5.2 Significance of Impacts

The CPU would not create alterations to present circulation movements in the area including existing public access points therefore impacts would be less than significant.

5.12.5.3 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation is required.

5.12.5.4 Significance after Mitigation

Impacts would be less than significant.

5.12.6 Issue 4: Alternative Transportation

Would the CPU conflict with the adopted policies, plans, or programs supporting alternative transportation modes (e.g., bus turnouts, trolley extensions, bicycle lanes, bicycle racks, etc.)?

5.12.6.1 Impacts

a. Network Configuration

The CPU includes plans for a pedestrian, transit, and bicycle transportation network (see Figures 3-2, 3-3, 3-5 and 3-6). With implementation of the CPU, Airway Road would serve as the principal community transportation and activity corridor. An east-west high frequency bus corridor is proposed to link between the South Bay bus rapid transit (BRT) and San Diego Trolley. The transit route that travels along Airway Road would link villages, employment centers, and Southwestern College within Otay Mesa. Additional right-of-way for Airway Road would provide the option for dedicated transit lanes or other transit priority measures. Additionally, a north-south BRT route is planned on SR-125 and SR-905 from the Otay Mesa POE north.

All local bus service within the CPU area would remain with implementation of the CPU. The BRT along the SR-125 and other bus routes in the CPU would continue to be operated by MTS. While the CPU takes into consideration future bus service, the future bus service to the area would be developed and provided by MTS. Changes to MTS bus service are out of the control of the Lead Agency (City).

The CPU would provide several more designated bicycle routes compared to the existing network, including a completely connected path along Airway Road; extending the Siempre Viva route; a connection from Otay View Hills Parkway through Caliente and Beyer; extension from Dennery Road through Ave de las Vistas/Exposition/ Corporate Center Drive to Otay Mesa Road; a route around the airport to Lone Star Road; and extended north-south routes on Cactus Road, Britannia, and La Media. Existing pedestrian paths are connected within the residential/commercial areas in the western plan area; however, the eastern plan area pedestrian network is fragmented and inconsistent. Buildout of the CPU would improve this condition by providing a connected pedestrian sidewalk along roadways. The proposed mixed-use areas would be designed to increase walkability. In this way, the CPU would positively affect alternative transportation.

b. CPU Goals and Policies

The CPU includes several goals and policies to promote alternative transportation consistent with the General Plan (see Section 5.12.1.1 for a summary of these goals and policies). The City of San Diego General Plan promotes alternative transportation through mixed-use villages, walkability, designs to promote transit, and bicycle access and transportation. As discussed in the Mobility Element (Chapter 3), the CPU includes the following alternative transportation goals:

- A pedestrian sidewalk and trails network that allows for safe and comfortable walking throughout the community.
- An effective transit network that provides fast and reliable service to local and regional destinations.
- A complete and interconnected street system that balances the needs of drivers, bicyclists, pedestrians, and others.
- A bicycle commuter network that links residents to transit, recreational, educational, and employment opportunities within the community.
- Transportation infrastructure and operations investments that facilitate goods movement and international travel, while fostering economic prosperity and a high quality of life within the community.

- Support for public health goals to increase the potential for walking and other forms of exercise to be incorporated into everyday life.

To implement these goals, the CPU includes a series of policies. Many of these policies promote alternative transportation by ensuring that such transportation would be safe, as detailed in Section 5.12.4 above. Also, several policies promote the future availability of transit, alternative transportation convenience (including connectivity and speed), and the appeal of alternative transportation. These policies include:

3.1-1 Provide a sidewalk and trail system with connections to villages, activity centers, and open spaces.

3.1-4 Enhance street or pedestrian connections within industrial superblocks through exterior improvements such as public art, pedestrian scale windows, entrances, signs, street furniture, landscape, and plazas.

3.1-5 Implement the Community Plan to contribute to more walkable, tree-lined streets, using identified drought-tolerant species.

3.2-1 Encourage SANDAG and MTS to expand transit investments and service in Otay Mesa.

3.2-2 Implement transit priority measures such as queue jumpers and signal priority measures to allow transit to bypass congestion and result in faster transit travel times at critical locations.

3.2-4 Emphasize transit orientation in village development plans including but not limited to those identified on the Community Plan Land Use Map, Community Plan Figure 2-1. See also OMCP Urban Design Element.

3.4-1 Refine and implement the Bicycle Master Plan in the Otay Mesa Community Plan area.

3.4-2 Provide multi-use trails in a manner consistent with the MSCP~~, including but not limited to the following locations~~ (see ~~also~~ Recreation Element, Trails Figure 7-1). ~~Please n~~Note that south of Otay Mesa Road these alignments are conceptual, with trail head areas and trail alignments being required with future specific plans.

All of these CPU policies and goals would be consistent with the City of San Diego's General Plan.

5.12.6.2 Significance of Impacts

The CPU would be consistent with existing policies supporting alternative transportation modes. There would be no conflict and, thus, there would be no impact.

5.12.6.3 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation is required.

5.12.6.4 Significance After Mitigation

Impacts would be less than significant.

CITY OF SAN DIEGO
FACILITIES FINANCING PROGRAM

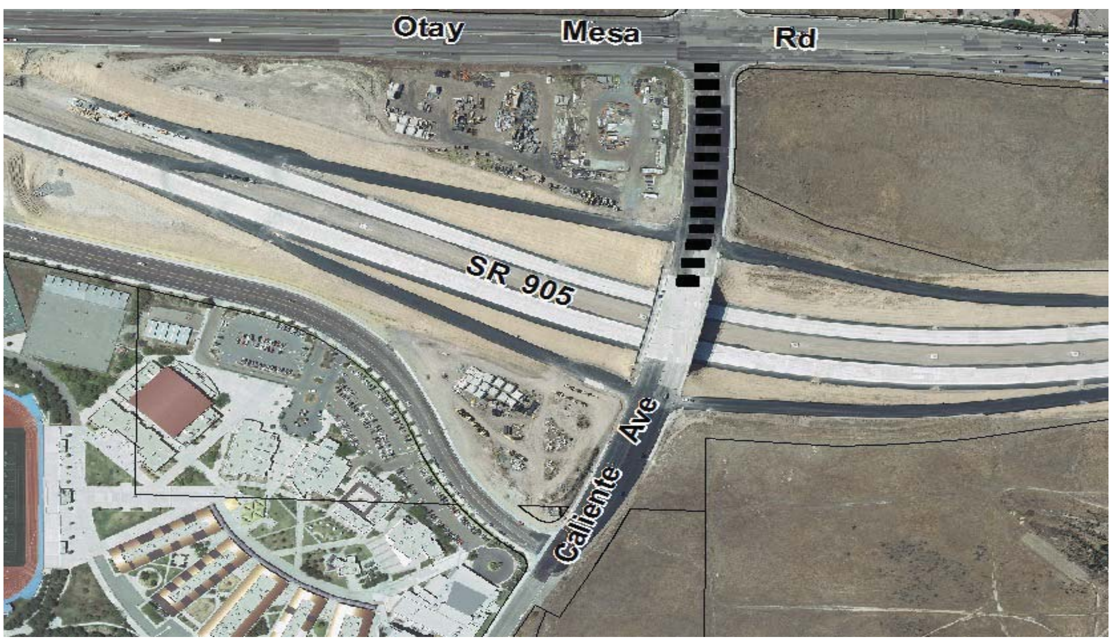
TITLE: **CALIENTE AVENUE (Otay Mesa Road to Proposed SR 905 Overpass)**

PROJECT: OM T-11.1

DEPARTMENT: PUBLIC WORKS — COUNCIL DISTRICT: 8
WBS, CIP, or JO #: N/A — COMMUNITY PLAN: OM

SOURCE	FUNDING:	EXPENDED	CONT APPROP	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
FBA-OM	**$390,000**							
DIF-OM								
FBA-OM(w)								
FBA-OM(e)								
PDIF (w)								
PDIF (e)								
DEV/SUBD								
OTHER	**$110,000**							
TOTAL	**$500,000**	$0	$0	$0	$0	$0	$0	$0

SOURCE	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
FBA-OM					$390,000			
DIF-OM								
FBA-OM(w)								
FBA-OM(e)								
PDIF (w)								
PDIF (e)								
DEV/SUBD								
OTHER					$110,000			
TOTAL	$0	$0	$0	$0	$500,000	$0	$0	$0



CONTACT: TRANSPORTATION & STORM WATER — TELEPHONE: (619) 533-3126 — EMAIL: N/A

CITY OF SAN DIEGO
FACILITIES FINANCING PROGRAM

TITLE: **CALIENTE AVENUE (Otay Mesa Road to Proposed SR 905 Overpass)**

PROJECT: OM T-11.1

DEPARTMENT: PUBLIC WORKS
CIP or JO #: N/A

COUNCIL DISTRICT: 8
COMMUNITY PLAN: OM

DESCRIPTION:

WIDEN TO PROVIDE A SOUTHBOUND RIGHT TURN LANE FROM CALIENTE AVENUE ONTO WESTBOUND SR-905 AND WIDEN TO ADD NORTHBOUND THROUGH LANE AT CALIENTE AVENUE AND OTAY MESA ROAD. THE LENGTH OF TURN LANES IN THIS CASE WOULD BE 400 LINEAL FEET.

JUSTIFICATION:

THE OTAY MESA COMMUNITY PLAN TRANSPORTATION ELEMENT SUGGESTS THAT AN INTEGRATED TRANSPORTATION NETWORK WILL PROVIDE MOBILITY AND ACCESSIBILITY TO THE RESIDENTS AND BUSINESSES OF THE COMMUNITY. THIS PROJECT IS CONSISTENT WITH THE GOALS OF THE OTAY MESA COMMUNITY PLAN AND THE CITY'S GENERAL PLAN, AND IS NEEDED TO SERVE THE COMMUNITY AT BUILDOUT.

FUNDING ISSUES:

OTHER FUNDING SOURCES:
UNIDENTIFIED: $110,000

NOTES:

SHOULD TRAFFIC CONDITIONS AT THE INTERCHANGE OF CALIENTE AVENUE AND SR-905 BECOME DETRIMENTAL TO THE IMPLEMENTATION OF REGIONAL ECONOMIC GOALS, ADDITIONAL IMPROVEMENTS MAY BE NECESSARY AT THE SR 905 FREEWAY AND/OR AT THE FREEWAY INTERCHANGE. THESE IMPROVEMENTS MAY INCLUDE, BUT ARE NOT LIMITED TO, ADDITIONAL FREEWAY LANES, AUXILIARY LANES, ADDITIONAL ON-RAMP LANES, ADDITIONAL INTERSECTION TURN LANES, AND FREEWAY OVERCROSSING WIDENING.. SUCH IMPROVEMENTS WOULD HAVE TO BE DETERMINED WITH CLOSE COORDINATION WITH CALTRANS AND VETTED THROUGH THEIR PSR PROCESS.

SCHEDULE:

FUNDING FOR DESIGN AND CONSTRUCTION IS ANTICIPATED IN FY 2026.

CONTACT: TRANSPORTATION & STORM WATER TELEPHONE: (619) 533-3126 EMAIL: N/A

CITY OF SAN DIEGO
FACILITIES FINANCING PROGRAM

TITLE: **CALIENTE AVENUE (SR 905 Overpass)**

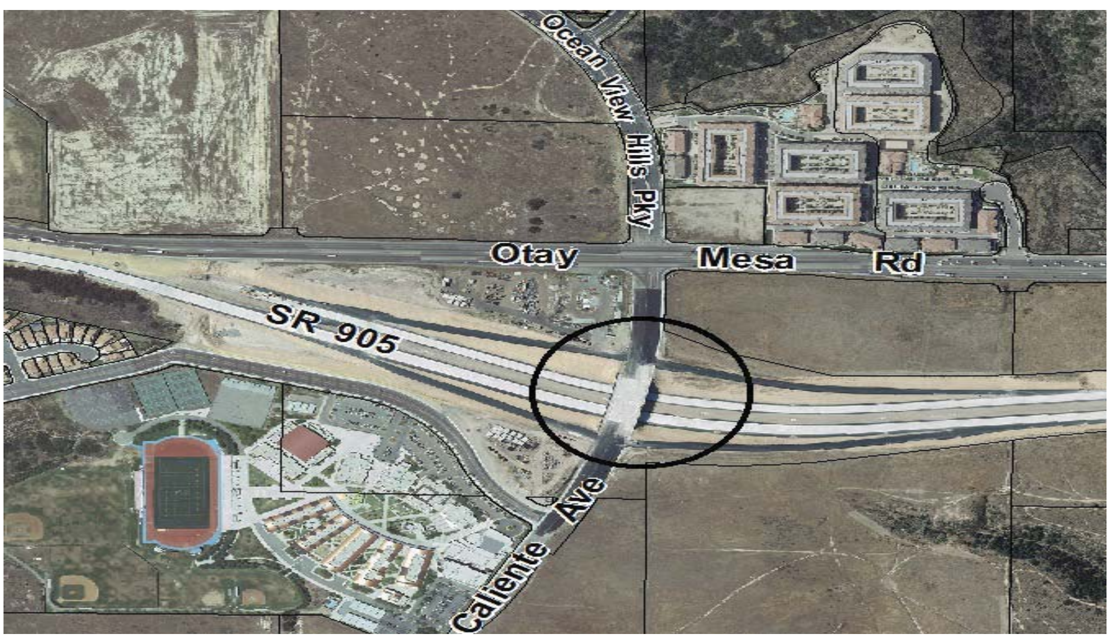
PROJECT: OM T-11.2

DEPARTMENT: PUBLIC WORKS
WBS, CIP, or JO #: N/A

COUNCIL DISTRICT: 8
COMMUNITY PLAN: OM

SOURCE	FUNDING:	EXPENDED	CONT APPROP	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
FBA-OM	**$39,000**							
DIF-OM								
FBA-OM(w)								
FBA-OM(e)								
PDIF (w)								
PDIF (e)								
DEV/SUBD								
OTHER	**$11,000**							
TOTAL	**$50,000**	$0	$0	$0	$0	$0	$0	$0

SOURCE	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
FBA-OM					$39,000			
DIF-OM								
FBA-OM(w)								
FBA-OM(e)								
PDIF (w)								
PDIF (e)								
DEV/SUBD								
OTHER					$11,000			
TOTAL	$0	$0	$0	$0	$50,000	$0	$0	$0



CONTACT: TRANSPORTATION & STORM WATER   TELEPHONE: (619) 533-3126   EMAIL: N/A

CITY OF SAN DIEGO
FACILITIES FINANCING PROGRAM

TITLE: **CALIENTE AVENUE (SR 905 Overpass)**

PROJECT: OM T-11.2

DEPARTMENT:	PUBLIC WORKS	COUNCIL DISTRICT:	8
CIP or JO #:	N/A	COMMUNITY PLAN:	OM

DESCRIPTION:

WIDEN CALIENTE AVENUE OVERPASS TO PROVIDE TWO NORTHBOUND AND TWO SOUTHBOUND LEFT TURN LANES. THE LENGTH OF TURN LANES IN THIS CASE WOULD BE 300 LINEAL FEET.

JUSTIFICATION:

THE OTAY MESA COMMUNITY PLAN TRANSPORTATION ELEMENT SUGGESTS THAT AN INTEGRATED TRANSPORTATION NETWORK WILL PROVIDE MOBILITY AND ACCESSIBILITY TO THE RESIDENTS AND BUSINESSES OF THE COMMUNITY. THIS PROJECT IS CONSISTENT WITH THE GOALS OF THE OTAY MESA COMMUNITY PLAN AND THE CITY'S GENERAL PLAN, AND IS NEEDED TO SERVE THE COMMUNITY AT BUILDOUT.

FUNDING ISSUES:

OTHER FUNDING SOURCES:
UNIDENTIFIED: $11,000

NOTES:

SHOULD TRAFFIC CONDITIONS AT THE INTERCHANGE OF CALIENTE AVENUE AND SR-905 BECOME DETRIMENTAL TO THE IMPLEMENTATION OF REGIONAL ECONOMIC GOALS, ADDITIONAL IMPROVEMENTS MAY BE NECESSARY AT THE SR 905 FREEWAY AND/OR AT THE FREEWAY INTERCHANGE. THESE IMPROVEMENTS MAY INCLUDE, BUT ARE NOT LIMITED TO, ADDITIONAL FREEWAY LANES, AUXILIARY LANES, ADDITIONAL ON-RAMP LANES, ADDITIONAL INTERSECTION TURN LANES, AND FREEWAY OVERCROSSING WIDENING.. SUCH IMPROVEMENTS WOULD HAVE TO BE DETERMINED WITH CLOSE COORDINATION WITH CALTRANS AND VETTED THROUGH THEIR PSR PROCESS.

SCHEDULE:

FUNDING FOR DESIGN AND CONSTRUCTION IS ANTICIPATED IN FY 2026.

CONTACT: TRANSPORTATION & STORM WATER TELEPHONE: (619) 533-3126 EMAIL: N/A

FW: Candlelight Traffic MMRP

Stephanie Morgan Whitmore

Thu 4/19/2018 11:44 AM

To: Justin Rasas (justin@losengineering.com) <justin@losengineering.com>;

Cc: Dawna Marshall <dmarshall@reconenvironmental.com>;

Per your request yesterday….

From: Andrew Capobianco
Sent: Thursday, April 19, 2018 11:43 AM
To: Stephanie Morgan Whitmore
Subject: Candlelight Traffic MMRP

While we wait on the Southwind EIR, here is the Candlelight Traffic Mitigation
____

Candlelight Traffic MMRP

Transportation/Circulation

Near-term Conditions

4.3-1 Prior to issuance of the first building permit, the Owner/Permitee shall assure by permit and bond the modification of the traffic signal at the intersection of Caliente Avenue and Otay Mesa Road to remove the crosswalk on the south leg of the intersection ,stripe a new crosswalk on the west leg of the intersection and modify the signal timing to provide less green time for the eastbound through movement and more green time for the westbound left-turn movement, satisfactory to the City Engineer. This improvement shall be completed and accepted by the City Engineer prior to issuance of any occupancy permit.

4.3-2 Prior to issuance of the first building permit, the Owner/Permitee shall assure by permit and bond the installation of a traffic signal at the intersection of Caliente Avenue and Airway Road and stripe the northbound, southbound, and westbound approaches to their ultimate lane configuration satisfactory to the City Engineer. If the ultimate pavement width is not in place to stripe the additional lanes, the Owner/Permitee shall widen the street. This improvement
shall be completed and accepted by the City Engineer prior to issuance of any occupancy permit.

Horizon Year Conditions

4.3-3 Prior to the issuance of the first building permit, the Owner/Permitee shall provide a 5.23-percent fair-share contribution towards providing an overlap phase for the northbound right-turn movement at the intersection of Otay Mesa Road and Caliente Avenue, satisfactory to the City Engineer

4.3-4 The recommended mitigation measure for the significant cumulative traffic impact at the SR-905 Westbound Ramps and the Caliente Avenue intersection is for the project applicant to pay 7.65-percent fair share contribution towards the construction of an exclusive southbound right-turn lane and striping modifications to Caliente Avenue to provide a second southbound right-turn lane and a second northbound left-turn lane. However, these impact are considered unmitigated since there are not currently planned or funded projects to expand the SR-905/Caliente Avenue interchange.

4.3-5 Prior to issuance of the first building permit, the Owner/Permitee, shall assure the installation of a traffic signal at the intersection of Caliente Avenue/Public Street "A", satisfactory to the City Engineer. The signal to be installed when warranted, and potentially can be assured through a bonded Deferred Improvement Agreement, to the satisfaction of the City Engineer.

Engineer. These improvements shall be completed and accepted by the City Engineer prior to the issuance of any occupancy permit.

36. Prior to the issuance of the first construction permit, the Owner/Permittee shall assure by permit and bond the construction of a traffic signal at Caliente Avenue and Airway Road, satisfactory to the City Engineer. These improvements shall be completed and accepted by the City Engineer prior to the issuance of any occupancy permit.

37. Prior to the issuance of the first construction permit, the Owner/Permittee shall assure by permit and bond the construction of a traffic signal at Caliente Avenue and Private Driveway "L", satisfactory to the City Engineer. These improvements shall be completed and accepted by the City Engineer prior to the issuance of any occupancy permit.

38. The Owner/Permittee shall construct: Private Driveways "A" - "G," 20 feet wide; Private Driveway "H," 21 feet wide; Private Driveways "I", "J" and "K," 28 feet wide with a 4 to 5 feet wide sidewalk; Private Driveway "L," 44 feet wide curb to curb with a 10 feet raised median and two, 5 feet wide sidewalks; and Private Driveway "J," 20 feet wide and extended to Caliente Avenue with no curb cut and bollards, all to the satisfaction of the City Engineer. These improvements shall be completed by the City Engineer prior to the issuance of any occupancy permit.

39. Prior to any work starting in the City of San Diego street right-of-way, the Owner/Permittee shall obtain a Public Right-of-Way Permit for Traffic Control.

PUBLIC UTILITIES DEPARTMENT REQUIREMENTS:

40. In lieu of designing and constructing either alone or in conjunction with other developers similarly conditioned to construct the next pending phase of the Otay Mesa Trunk Sewer (OMTS); or executing an agreement not objecting to formation of Community Facility District (CFD), prior to the issuance of any construction permits the Owner/Permittee shall design and construct one segment of the OMTS just to the south of existing Manhole No. 200 where the pipe size changes from newly constructed 42-inch diameter pipeline to an existing 10-inch diameter pipeline in a manner satisfactory to the Public Utilities Director and the City Engineer.

41. The proposed development is currently subject to the following sewer reimbursement fee: The Otay Mesa Sewer Surcharge fee of $1,821.75 per living unit plus 6% simple interest from March 12, 2008 (DWG 21351-D-O).

42. Prior to issuance of any construction permits, the Owner/Permittee shall obtain Encroachment and Maintenance Removal Agreement (EMRA) for proposed improvements of any kind, including utilities, landscaping, enriched paving, and electrical conduits to be installed within the public- right-of-way or public easement.

43. Prior to the issuance of any construction permits, the Owner/Permittee shall assure by permit and bond, the design and construction of any new water and sewer service(s) outside of any driveway, and the disconnection at the water main of the existing unused water service

DEFERRED IMPROVEMENT AGREEMENT

Emerald Crest Court ("JJ") Traffic Signal Improvement
California Terraces/Ocean Views Hills Planning Areas 13 and 14 Project

THIS AGREEMENT is made by the City of San Diego, a municipal corporation [City], and Otay Greenfield Developers, a California limited liability company [Developer], [Parties].

RECITALS

1. Developer holds the title to that certain real property [Property] located in the City of San Diego, the legal description of which is set forth as Exhibit "A" attached hereto.

2. On July 19, 2005, the City Council of the City of San Diego adopted Resolution No. R-300688_approving the California Terraces (a.k.a. Ocean View Hills) Planning Area 13 and 14 project, VTM Project No. 6450 for the Property subject to the conditions of approval attached to said resolution and made a part thereof. Developer is currently seeking City approval of final maps and improvement plans.

3. Pursuant to Condition Nos 46, Vesting Tentative Map (VTM) No. 6450 (Cor. Copy 2), Developer is required to complete the improvements for a traffic signal at the location of Otay Mesa Road and Emerald Crest Court, also known as JJ Street [Improvements] in the following manner:

   The Subdivider shall assure by bond construction of a traffic signal at the intersection of Otay Mesa Road/"JJ" Street, satisfactory to the City Engineer once Otay Mesa Road is returned to the City of San Diego and full access is allowed at the intersection.

4. Otay Mesa Road was widened and improved by the City of San Diego from the I-805/I-905 separation to east of La Media Road. Otay Mesa Road was designed and improved to meet State of California design requirements through a Cooperative Agreement recorded December 10, 1996, per File No. RR-288209, and will be under the State of California jurisdiction until SR-905 is constructed between I-805 and SR-125. The intersection spacing for traffic signal systems per the State of California requirements is ½ mile, which differs from the ¼ mile spacing the City of San Diego allows. Since the roadway is now under the State's jurisdiction, the traffic signal system at Emerald Crest Court is not allowed due to the State's signal spacing requirements and, therefore cannot be constructed consistent with Condition No. 46 until such time as the City regains jurisdiction over Otay Mesa Road from the State.

5. Consistent with Condition 46 of Resolution No. R-300688, Developer desires to enter into a Deferred Improvement Agreement for this traffic signal improvement, more particularly

described in Exhibit "B", attached hereto and incorporated by reference and shown in Exhibit "C", attached hereto and incorporated by reference.

The above-listed recitals are true and correct and are hereby incorporated by reference.

DEFINITIONS

For the purposes of this Agreement, the terms below shall be defined as follows:

Acceptance: Final approval by the City Inspection Team following the Final Inspection that Improvements are complete and work required on the Punch List, if any, has been finished.

As-Builts: Project Record Documents that are the Contract plans modified from the original concept of the design to reflect the actual product built.

ARTICLE 1 – DURATION OF AGREEMENT

1.1 **Term of Agreement.** This Agreement shall be effective on the date it is executed by the last Party to sign the Agreement and shall be effective until all Improvements are completed to the satisfaction of the City Engineer and accepted by the City.

ARTICLE 2 – DESIGN AND CONSTRUCTION

2.1 **Completion Date.** The Improvements shall be completed within two (2) years of the City regaining jurisdiction over Otay Mesa Road from the State, as described in Paragraph 4, above, or, in the event that the City Engineer specifies an earlier date for completion of the Improvements, the Developer shall complete the Improvements by the date specified by the City Engineer.

2.1.1 *Written Notice.* If the City Engineer requires the completion of the Improvements prior to the time set forth above, the City Engineer will provide written notice to Developer indicating the date by which the City Engineer requires the completion of the Improvements.

2.1.1.1 Developer will complete Improvements within [365] Calendar Days from the date of the written notice from the City Engineer.

2.1.2 *No Waiver.* In no event shall the failure of the City to enforce the two (2) year provision in section 2.1 act as a release of Developer's obligation to construct the Improvements.

2.1.2.1 The City may, at any time, following the two (2) year period identified in section 2.1, deliver a Notice to Commence

Construction [Notice] to the Developer. In the event that the City delivers such Notice, the Developer shall commence construction of the Improvements within ninety (90) Calendar Days of delivery of the Notice, regardless of the amount of time, which has passed since the two (2) year period elapsed.

2.1.2.1.1 Failure to Commence Construction. The failure of the Developer to commence construction of the Improvements within ninety (90) Calendar Days of delivery of the Notice shall be a breach of this Agreement.

2.1.3 *Extensions of Completion Date.* The Completion Date may be extended with the written consent of the City provided that the Developer is in compliance with all other terms of this Agreement, including bonding, and the City Engineer is satisfied that the Improvements will not be needed within the two year timeframe initially established.

2.2 **Design.** Developer shall design Improvements in a manner satisfactory to the City Engineer and in accordance with Condition No. 46.

2.3 **Construction.** Developer shall construct Improvements in accordance with a public improvement permit and approved plans to the satisfaction of the City Engineer.

2.3.1 *Permits.* Developer shall obtain a public improvement permit from the City Engineer and any other necessary permitting authority prior to commencing construction.

2.3.2 *As Builts.* Developer shall prepare as-built plans for Improvements to the satisfaction and approval of the City Engineer.

2.4 **Standard of Care.** Developer agrees that the professional services provided as part of this Agreement in the design and construction of the Improvements shall be performed in accordance with the standards customarily adhered to by experienced and competent professional architectural, engineering, landscape architecture, and construction firms using the degree of care and skill ordinarily exercised by reputable professionals practicing in the same field of service in the State of California.

2.4.1 *Compliance with all Laws.* Developer shall comply with all laws, when applicable, including but not limited to:

2.4.1.1 All local, City, County, State, and Federal laws, codes and regulations, ordinances, and policies, including but not limited to, Development Services Department permits, hazardous material permits, site safety, state and local Building Codes, stormwater regulations, etc.

2.4.1.2 The Americans with Disabilities Act [ADA] and Title 24 of the California Building Code. It is the sole responsibility of Developer to comply with all ADA and Title 24 regulations.

2.4.1.3 Developer shall complete all environmental measures required by CEQA (State requirements), NEPA (Federal requirements), and the local jurisdiction, including but not limited to, mitigation measures, and site monitoring.

2.4.1.4 Developer shall comply with the Clean Air Act of 1970, the Clean Water Act (33 USC 1368) Executive Order 11738, and the Stormwater Management and Discharge Control Ordinance No. 0 17988.

2.4.1.5 Developer shall comply with the Essential Services Building Seismic Safety Act, SB 239 & 132.

2.4.1.6 Developer shall comply immediately with all directives issued by City or its authorized representatives under authority of any laws, statutes, ordinances, rules, or regulations.

2.4.2 *Compliance with Design and Construction Standards.* Developer shall comply with the most current editions of Design and Construction Standards.

2.4.2.1 Standard Specifications. Developer shall comply with the most current editions of the following reference specifications when designing and constructing the Project, including:

2.4.2.1.1 The most recent edition of the Standard Specifications for Public Works Construction, including the Regional and City of San Diego Supplement Amendments [Greenbook].

2.4.2.1.2 California Department of Transportation Manual of Traffic Controls for Construction and Maintenance Work Zones.

2.4.2.2 City Standards. Developer's professional services shall be provided in conformance with the professional standards of practice established by City. This includes all amendments and revisions of these standards as adopted by City. The professional standards of practice established by City include, but are not limited to, the following:

2.4.2.2.1	City of San Diego's Drainage Design Manual.
2.4.2.2.2	City of San Diego's Landscape Technical Manual produced by the Planning Department.
2.4.2.2.3	City of San Diego's Street Design Manual.
2.4.2.2.4	City of San Diego's Manual of Preparation of Land Development and Public Improvement Plans.
2.4.2.2.5	City of San Diego's Technical Guidelines for Geotechnical Reports.
2.4.2.2.6	City of San Diego Standard Drawings including all Regional Standard Drawings.
2.4.2.2.7	City of San Diego Data Standards for Improvement Plans.

2.4.3 *Imputed Knowledge.* Developer shall be responsible for all amendments or updates to standards and knowledge of all amendments or updates to standards, whether local, state, or federal, and such knowledge will be imputed to Developer to the extent allowed by law.

2.4.5 *City Approval Not a Waiver of Obligations.* Where approval by City, the City Manager, or other representatives of City is required, it is understood to be general approval only and does not relieve Developer of responsibility for complying with all applicable laws, codes, and good consulting, design, or construction practices.

ARTICLE 3 – BONDS

3.1 **Post a Performance Bond.** Prior to the execution of this Agreement, and prior to issuance of the public improvement permit for the Improvement, Developer shall post a Performance and Payment Bond [Performance Bond] in the amount of $162,000.00, for costs identified on Exhibit "D", Cost Estimate. The Performance Bond shall guarantee the faithful performance of this Agreement, the completion of the Improvements, and assure payment to contractors, subcontractors, and to persons furnishing materials or equipment for the design, construction, and completion of the Improvements.

3.1.1 *Form of Bond.* The Performance Bond shall be identical in form and verbiage to the attached Exhibit "E". Any changes to the form or verbiage of the Performance Bond shall require approval of the City Attorney and will cause additional delay in approval of this Agreement.

3.1.2 *Bond Term.* The Performance Bond shall remain in full force and effect for the Term of this Agreement. The Performance Bond shall be renewed annually, and the Developer shall provide proof of annual renewal to the City.

3.1.3 *Certificate of Agency.* All bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

3.1.4 *Licensing and Rating.* The Performance Bond shall be duly executed by responsible surety companies admitted to do business in the State of California, licensed or authorized in the jurisdiction in which the project is located to issue bonds for the limits required by this agreement, secured through an authorized agent with an office in California, and have a minimum AM Best rating of "A-" to an amount not to exceed ten percent (10%) of its capital and surplus.

3.1.5 *Insolvency or Bankruptcy.* If the surety on any bond furnished by Developer is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Improvements are located, Developer shall within seven (7) Calendar Days thereafter substitute or require the substitution of another bond and surety, acceptable to the City.

3.1.6 *Increase in Amount of Performance Bond.* If, at any time, following the execution of this Agreement, the estimated costs of the Improvements exceed, or are anticipated to exceed, the amount identified in the Cost Estimate Sheet, Developer shall, within thirty (30) Calendar Days, increase the amount of the Performance Bond by the change in the estimated cost.

ARTICLE 4. - INDEMNITY & DUTY TO DEFEND

4.1 **Indemnification and Hold Harmless Agreement.** Except for liability for the Professional Services covered under section 4.2, Developer agree to defend, indemnify, protect, and hold harmless the City, its agents, officers and employees, from and against all claims, demands, causes of action, liability or loss asserted or established for damages or injuries to any person or property arising out of Improvements. The indemnification and hold harmless obligation contained in this section includes claims, demands, causes of action, liability or loss asserted or established by the Developer's employees, agents or officers, or judgments arising directly or indirectly out of obligations, work or services arising out of City entering into this Agreement. Claims, demand, causes of action, liability or loss that arise from, are connected with, or are caused or claimed to be caused by the acts or omission of the Developer, the Developer's agents, officers and employees are covered. Also covered are the claims, demands, causes of action, liability or loss arising from, connected with, caused by, or claimed to be caused by the active or passive negligence acts or omissions of the City, its agents, officers, or employees which may be in combination with the negligence of the Developer, its employees, agents or officers, or any third party. Also covered are any claims, demands, causes of action, liability or loss arising from, connected with, caused by, or claimed to be caused by the diversion of waters resulting from the design, construction or maintenance of drainage systems, streets or other improvements. The Developer's duty to defend, indemnify, protect and hold harmless shall not include any claims or liabilities arising from the established sole negligence or sole willful misconduct of the City, its agents, officers or employees.

4.2 **Indemnification for Professional Services.** As to professional obligations, work, or services of an architect, engineer, or other professional related to the Improvements, the Developer shall defend, indemnify, protect, and hold harmless the City, its agents, officers and employees from and against any and all liability, claims, costs, and damages, including but not limited to, attorney fees, and losses or payments for injury to any person or property, caused directly or indirectly from the negligent acts, errors or omissions of the professional, architect, engineer, its employees, agents, or officers. The Developer shall require its Architect, Engineer, or other professional of record to defend, indemnify, protect, and hold harmless the City, its agents, officers and employees from and against any and all liability, claims, costs, and damages, including but not limited to, attorney fees, and losses or payments for injury to any person or property, caused directly or indirectly from the negligent acts, errors or omissions of the professional, architect, engineer, its employees, agents, or officers. This section in no way alters, affects or modifies the Developer's, Architect's, Engineer's, or other professional's obligations and duties under this Agreement.

4.3 **Indemnification for Liens and Stop Notices.** The Developer shall keep the Project and Property free of any mechanic's liens and immediately secure the release of any stop notices. The Developer shall defend, indemnify, protect, and hold harmless, the City, its agents, officers and employees from and against any and all liability, claims, costs, and damages, including but not limited to, attorney fees, arising from or attributable to a failure to pay claimants. Developer shall be responsible for payment of all persons entitled to assert liens and stop notices.

4.4 **Enforcement Costs.** The Developer agrees to pay any and all costs the City incurs to enforce the indemnity and defense provisions set forth in section 4.1, 4.2, and 4.3. Developers further agree that the indemnification agreement referred to in Section 4.1, 4.2, and 4.3 and the duty to defend City require Developer to pay any costs City incurs that are associated with defending any claims arising from deferring construction of Improvements and the subsequent construction of Improvements and any other work performed under this Agreement. If City chooses, at its own election, to conduct its own defense, participate in its own defense or obtain independent legal counsel in defense on any claim related to work provided under this Agreement, Developer agrees to pay the reasonable value of attorneys' fees and all of City's reasonable costs.

4.5 **No Assumption of Liability.** Acceptance by City of the improvements shall not constitute an assumption by City of any responsibility for such damage or taking. City shall not be an insurer or surety for the design or construction of the Improvements pursuant to the approved improvement plans.

4.6 **Full Force and Effect.** This Article shall remain in full force and effect for ten (10) years following acceptance of the Improvements by the City, except that the obligation to maintain drainage systems shall terminate upon acceptance of such improvements by the City.

ARTICLE 5 - INSURANCE

5.1 **General.** During the entire life of this Agreement, Developer shall secure and maintain a policy or policies of Commercial General Liability insurance, at its sole cost and expense, as follows:

5.1.1 *Policy Coverage.* Developer shall secure Commercial General Liability insurance with limits of not less than two million dollars ($2,000,000.00) per occurrence. Coverage shall be written on an "occurrence" form.

5.1.2 *Deductibles.* Any deductibles and/or self insured retentions must be disclosed to and approved by City at the time evidence of insurance is provided.

5.2 **Rating Requirements.** Except for State Compensation Insurance Fund, all insurance required by express provision of this Contract shall be carried only by responsible insurance companies that have been given at least an "A" or "A-" and "VI" rating by AM BEST, that are authorized by the California Insurance Commissioner to do business in the State of California, and that have been approved by the City.

5.2.1 *Non-Admitted Carriers.* The City will accept insurance provided by non-admitted, "surplus lines" carriers only if the carrier is authorized to do business in the State of California and is included on the List of Eligible Surplus Lines Insurers [LESLI list].

5.3 **Endorsements Required.** Each policy required under Article XXVIII, section 28.2 of this Agreement shall expressly provide, and an endorsement shall be submitted to the City, that:

5.3.1 *Additional Insureds.* All insurance policies will name City, its elected officials, representatives, agents, officers and employees as additional insureds and protect City against any costs, including legal fees, in the investigation and/or defense of any claim arising from performance of the obligations of this Agreement. A copy of the actual additional insured endorsement must be provided to City, along with the required Certificate of Insurance.

5.3.2 *Primary and Non-Contributory.* The policies are primary and non-contributing to any insurance or self-insurance that may be carried by the City of San Diego, its elected officials, officers, employees, agents, and representatives with respect to operations, including the completed operations if appropriate, of the Named Insured. Any insurance maintained by the City of San Diego and its elected officials, officers, employees, agents, and representatives shall be in excess of Developer's insurance and shall not contribute to it.

5.3.3 *Project General Aggregate Limit.* The CGL policy or policies must be endorsed to provide a Designated Construction Project General Aggregate Limit that will apply only to the Work performed under this Agreement. Claims payments not arising from the Work shall not reduce the Designated Construction Project General Aggregate Limit. The Designated Construction Project General Aggregate Limit shall be in addition to the aggregate limit provided for the products-completed operations hazard.

5.3.4 *Written Notice.* Except as provided for under California law, the policies cannot be canceled, non-renewed or materially changed except after thirty (30) Calendar Days prior written notice by Developer to the City by certified mail, as reflected in an endorsement which shall be submitted to the City, except for non-payment of premium, in which case ten (10) Calendar Days notice shall be provided.

5.3.5 The words "will endeavor" and "but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents, or representatives" shall be deleted from all certificates.

5.3.6 *Additional Insurance.* Developer may obtain additional insurance not required by this Agreement.

5.3.7 *Prior to Starting Work.* Before performing any work, Developer shall provide the City with all Certificates of Insurance accompanied by all endorsements.

5.4 **Additional Insurance.** In addition to the above policy of insurance, Developer also agrees to name the City as an additional insured on any excess liability policies held by Developer over and above the two million dollars ($2,000,000.00) required.

5.5 **Obligation to Provide Documents.** The Developer shall provide copies of documents including but not limited to certificates of insurance and endorsements, and shall furnish renewal documentation prior to expiration of insurance. Each required document shall be signed by the insurer or a person authorized by the insurer to bind coverage on its behalf. The City reserves the right to require complete, certified copies of all insurance policies required herein.

5.6 **Deductibles/Self Insured Retentions.** All deductibles and self-insurance retentions on any policy shall be the responsibility of Developer. Deductibles and self-insurance retentions shall be disclosed to the City at the time the evidence of insurance is provided.

5.7 **Policy Changes.** Developer shall not modify any policy or endorsement thereto which increases the City's exposure to loss for the duration of this Contract.

5.8 **Reservation of Rights.** The City reserves the right, from time to time, to review the Developer's insurance coverage, limits, deductible, and self-insured retentions to determine if they are acceptable to the City. The City will reimburse the Developer for the cost of the additional premium for any coverage requested by the City in excess of that required by this Agreement without overhead, profit, or any other markup.

5.9 **Not a Limitation of Other Obligations.** Insurance provisions under this section shall not be construed to limit the Developer's obligations under this Agreement, including Indemnity.

5.10 **Material Breach.** Failure to maintain, renew, or provide evidence of renewal during the term of this Agreement may be treated by the City as a material breach of contract.

ARTICLE 6. WARRANTIES

6.1 **Warranties Required.** Developer shall provide and require its agents to provide the warranties listed below. This warranty requirement is not intended to exclude, and shall not exclude, other implicit or explicit warranties or guarantees required or implied by law.

6.1.1 *Materials and Workmanship.* Developer shall guarantee, and shall require its agents to guarantee, all work on the Improvements against defective workmanship and materials furnished by Developer for a period of two (2) years from the date of Final Completion and Acceptance. Developer shall replace or repair any such defective work in a manner satisfactory to City, after notice to do so from City, and within the time specified in the notice.

6.1.2 *New Materials and Equipment.* Developer shall warrant and guarantee, and shall require its agents to warrant and guarantee, to City that all materials and equipment incorporated into the Improvements are new unless otherwise specified.

6.1.3 *Design, Construction, and Other Defects.* Developer shall warrant and guarantee, and shall require its agents to warrant and guarantee to City that all work is in accordance with the Plans and Specifications and is not defective in any way in design, construction or otherwise.

6.1.4 *Warranty Start Date.* Except for items put into use with Developer's permission with date mutually agreed upon in writing, the Warranty Start Date shall be the date of Final Completion.

6.2 **Term of Warranties.** Unless otherwise specified or provided by law, warranties shall extend for a term of two (2) year(s) from the date of Final Completion.

6.2.1 *Plants, Trees, and Shrubs.* Not withstanding above, all shrubs and ground cover shall have a ninety (90) Calendar Day warranty period and trees shall have a one (1) year warranty period. All plant warranties shall commence from the date of Final Completion.

ARTICLE 7 - NOTICES

7.1 **Writing.** Any demand upon or notice required or permitted to be given by one Party to the other Party shall be in writing.

7.2 **Effective Date.** Except in relation to Change Orders as provided for in section 7.4 or as otherwise provided by law, any demand upon or notice required or permitted to be given by one Party to the other Party shall be effective: (i) on personal delivery, (ii) on the second business day after mailing by certified or registered U.S. Mail, return receipt requested, (iii) on the succeeding business day after mailing by Express Mail or after deposit with a private delivery service of general use (e.g., Federal Express) postage or fee prepaid as appropriate, or (iv) upon successful transmission of facsimile.

7.3 **Recipients.** Except in relation to Change Orders, all demands or notices required or permitted to be given shall be sent to all of the following:

To the City: City of San Diego
Land Development Review
Attn: Kelly Broughton
1222 First Avenue, 5th Floor
San Diego, California 92101

To the Developer: Otay Greenfield Developers, LLC
Attn: Carol Matson
8530 Costa Verde Blvd-Office
San Diego, CA 92122

ARTICLE 8 - MISCELLANEOUS

8.1 **Headings.** All article headings are for convenience only and shall not affect the interpretation of this Agreement.

8.2 **Gender & Number.** Whenever the context requires, the use herein of (i) the neuter gender includes the masculine and the feminine genders and (ii) the singular number includes the plural number.

8.3 **Reference to Paragraphs.** Each reference in this Agreement to a section refers, unless otherwise stated, to a section this Agreement.

8.4 **Incorporation of Recitals.** All recitals herein are incorporated into this Agreement and are made a part hereof.

8.5 **Covenants and Conditions.** All provisions of this Agreement expressed as either covenants or conditions on the part of the City or the Developer, shall be deemed to be both covenants and conditions.

8.6 **Integration.** This Agreement and the Exhibits and references incorporated into this Agreement fully express all understandings of the Parties concerning the matters covered in this Agreement. No change, alteration, or modification of the terms or conditions of this Agreement, and no verbal understanding of the Parties, their officers, agents, or employees shall be valid unless made in the form of a written change agreed to in writing by both Parties or an amendment to this Agreement agreed to by both Parties. All prior negotiations and agreements are merged into this Agreement.

8.7 **Severability.** The unenforceability, invalidity, or illegality of any provision of this Agreement shall not render any other provision of this Agreement unenforceable, invalid, or illegal.

8.8 **Drafting Ambiguities.** The Parties agree that they are aware that they have the right to be advised by counsel with respect to the negotiations, terms and conditions of this Agreement, and the decision of whether or not to seek advice of counsel with respect to this Agreement is a decision which is the sole responsibility of each Party. This Agreement shall not be construed in favor of or against either Party by reason of the extent to which each Party participated in the drafting of the Agreement.

8.9 **Conflicts Between Terms.** If an apparent conflict or inconsistency exists between the main body of this Agreement and the Exhibits, the main body of this Agreement shall control. If a conflict exists between an applicable federal, state, or local law, rule, regulation, order, or code and this Agreement, the law, rule, regulation, order, or code shall control. Varying degrees of stringency among the main body of this Agreement, the Exhibits, and laws, rules, regulations, orders, or codes are not deemed conflicts, and the most stringent requirement shall control. Each Party shall notify the other immediately upon the identification of any apparent conflict or inconsistency concerning this Agreement.

8.10 **Prompt Performance.** Time is of the essence of each covenant and condition set forth in this Agreement.

8.11 **Good Faith Performance.** The parties shall cooperate with each other in good faith, and assist each other in the performance of the provisions of this Agreement.

8.12 **Further Assurances.** City and Developer each agree to execute and deliver such additional documents as may be required to effectuate the purposes of this Agreement.

8.13 **Exhibits.** Each of the following Exhibits is attached hereto and incorporated herein by this reference:

Exhibit A	-	Legal Description of Property
Exhibit B	-	Project Description
Exhibit C	-	Intersection Diagram
Exhibit D	-	Bond Estimate
Exhibit E	-	Performance Bond

8.14 **Compliance with Controlling Law.** The Developer shall comply with all laws, ordinances, regulations, and policies of the federal, state, and local governments applicable to this Agreement, including California Labor Code section 1720 as amended in 2000 relating to the payment of prevailing wages during the design and preconstruction phases of a project, including inspection and land surveying work. In addition, the Developer shall comply immediately with all directives issued by the City or its authorized representatives under authority of any laws, statutes, ordinances, rules, or regulations. The laws of the State of California shall govern and control the terms and conditions of this Agreement.

8.15 **Jurisdiction, Venue, and Attorney Fees.** The venue for any suit or proceeding concerning this Agreement, the interpretation or application of any of its terms, or any related disputes shall be in the County of San Diego, State of California. The prevailing Party in any such suit or proceeding shall be entitled to a reasonable award of attorney fees in addition to any other award made in such suit or proceeding.

8.16 **Municipal Powers.** Nothing contained in this Agreement shall be construed as a limitation upon the powers of the City as a chartered city of the State of California.

8.17 **Third Party Relationships.** Nothing in this Agreement shall create a contractual relationship between City and any third party; however, the Parties understand and agree that City, to the extent permitted by law, is an intended third party beneficiary of all Developer's contracts, purchase orders and other contracts between Developer and third party services. Developer shall incorporate this provision into its contracts, supply agreements and purchase orders.

8.18 **Non-Assignment.** The Developer shall not assign the obligations under this Agreement, whether by express assignment or by sale of the company, nor any monies due or to become due, without the City's prior written approval. Any assignment in violation of this paragraph shall constitute a Default and is grounds for immediate termination of this Agreement, at the sole discretion of the City. In no event shall any putative assignment create a contractual relationship between the City and any putative assignee.

8.19 **Successors in Interest.** This Agreement and all rights and obligations created by this Agreement shall be in force and effect whether or not any Parties to the Agreement have been succeeded by another entity, and all rights and obligations created by this Agreement shall be vested and binding on any Party's successor in interest.

8.20 **Independent Contractors.** The Developer, any consultants, contractors, subcontractors, and any other individuals employed by the Developer shall be independent contractors and not agents of the City. Any provisions of this Agreement that may appear to give the City any right to direct the Developer concerning the details of performing the Services under this Agreement, or to exercise any control over such performance, shall mean only that the Developer shall follow the direction of the City concerning the end results of the performance.

8.21 **Approval.** Where the consent or approval of a party is required or necessary under this Agreement, the consent or approval shall not be unreasonably withheld.

8.22 **No Waiver.** No failure of either the City or the Developer to insist upon the strict performance by the other of any covenant, term or condition of this Agreement, nor any failure to exercise any right or remedy consequent upon a breach of any covenant, term, or condition of this Agreement, shall constitute a waiver of any such breach of such covenant, term or condition. No waiver of any breach shall affect or alter this Agreement, and each and every covenant, condition, and term hereof shall continue in full force and effect to any existing or subsequent breach.

8.23 **Signing Authority.** The representative for each Party signing on behalf of a corporation, partnership, joint venture or governmental entity hereby declares that authority has been obtained to sign on behalf of the corporation, partnership, joint venture, or entity and agrees to hold the other Party or Parties hereto harmless if it is later determined that such authority does not exist.

IN WITNESS WHEREOF, this Agreement is executed by the City of San Diego, acting by and through the City Manager, pursuant to the San Diego Municipal Code and by Developer on this ___ day of _______, 200__.

THE CITY OF SAN DIEGO
a municipal corporation

By: ______________________
Kelly G. Broughton
Deputy Director land Development Review Dept.

OTAY GREENFIELD DEVELOPERS LLC, a
California limited liability company

By: National Safe Harbor Exchanges,
a California corporation
Its: Sole Member

By: ______________________
Karin A. Church
Vice President

I HEREBY APPROVE the form and legality of the foregoing Agreement this 24th day of April, 2007.

By: ______________________
Deputy City Attorney

Deferred Improvement Agreement 09/02

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, James V. Woodley, a Notary Public for the aforesaid County and State certify that Karin A. Church personally came before me this day and acknowledged that she is a Vice President of National Safe Harbor Exchanges, a California corporation, the sole member of Otay Greenfield Developers, LLC, an California limited liability company, and that by authority duly given and as the act of the corporation, the foregoing instrument was signed in its name by Karin A. Church, as the Vice President. Witness my hand and official seal this 12th day of April, 2007.

My commission Expires:

James V. Woodley
Notary Public

NOV. 6, 2009

OFFICIAL SEAL
JAMES V. WOODLEY
NOTARY PUBLIC - State of Arizona
MARICOPA COUNTY
My Comm. Expires Nov. 6, 2009

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California

County of San Diego

On APRIL 27, 2007 (Date) before me, Phillip D. Hill, Notary Public (Name and Title of Officer (e.g., "Jane Doe, Notary Public")),

personally appeared KELLY BROUGHTON (Name(s) of Signer(s)),

☑ personally known to me

☐ (or proved to me on the basis of satisfactory evidence)

PHILLIP D. HILL
Commission # 1514078
Notary Public - California
San Diego County
My Comm. Expires Sep 17, 2008

to be the person~~(s)~~ whose name~~(s)~~ is~~/are~~ subscribed to the within instrument and acknowledged to me that he~~/she/they~~ executed the same in his~~/her/their~~ authorized capacity~~(ies)~~, and that by his~~/her/their~~ signature~~(s)~~ on the instrument the person~~(s)~~, or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

WITNESS my hand and official seal.

Phillip D. Hill

Signature of Notary Public

Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: DEFERRED IMPROVEMENT AGREEMENT - EMERALD CREST COURT TRAFFIC SIGNAL IMPROVEMENT

Document Date: ____________ Number of Pages: ____________

Signer(s) Other Than Named Above: ____________

Capacity(ies) Claimed by Signer(s)

Signer's Name: ____________
- ☐ Individual
- ☐ Corporate Officer — Title(s): ____________
- ☐ Partner — ☐ Limited ☐ General
- ☐ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: ____________

Signer Is Representing: ____________

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer's Name: ____________
- ☐ Individual
- ☐ Corporate Officer — Title(s): ____________
- ☐ Partner — ☐ Limited ☐ General
- ☐ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: ____________

Signer Is Representing: ____________

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

IMPROVEMENT SECURITY

Form of: Performance Bond

Agency: Corporate Insurance Agency, Inc.

Amount: $162,000.00

W.O. No. 425735

NOTARY ACKNOWLEDGMENTS
MUST BE ATTACHED - PER
CIVIL CODE, SEC. 1180, et. seq.

EXHIBIT "A"

LEGAL DESCRIPTION OF PROPERTY

EXHIBIT "A"

GREENFIELD VILLAGE
CALIFORNIA TERRACES 13/14
SEE DRAWING NO. 34078-D AND 34089-D

LEGAL DESCRIPTION

BEING A SUBDIVISION OF PORTIONS OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER AND SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 29, TOWNSHIP 18 SOUTH, RANGE 1 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF. EXCEPTING THEREFROM THAT PORTION IN OCEAN VIEW HILLS CORPORATE CENTER UNIT #2 ACCORDING TO MAP THEREOF NO. 14258 FILED IN THE OFFICE OF COUNTY RECORDER OF SAN DIEGO COUNTY, AUGUST 14,2001.

LICENSED LAND SURVEYOR
GARY L. HUS
NO. 7019
Exp. date 6-30-08
STATE OF CALIFORNIA

GARY L. HUS, L.S. 7019
LIC. EXP. 06/30/2008
DATE: 9-29-2006

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Environmental | Engineering | Survey
701 B Street, Suite 800 San Diego, CA 92101
619.235.6471 Tel 619.234.0349 Fax

PAGE 1 OF 1

P:\2253\ENGR\EXHIBITS\2253 JJ-DEA 09-20-06.dwg 9/28/2006 10:38:34 AM PDT

EXHIBIT "B"

PROJECT DESCRIPTION

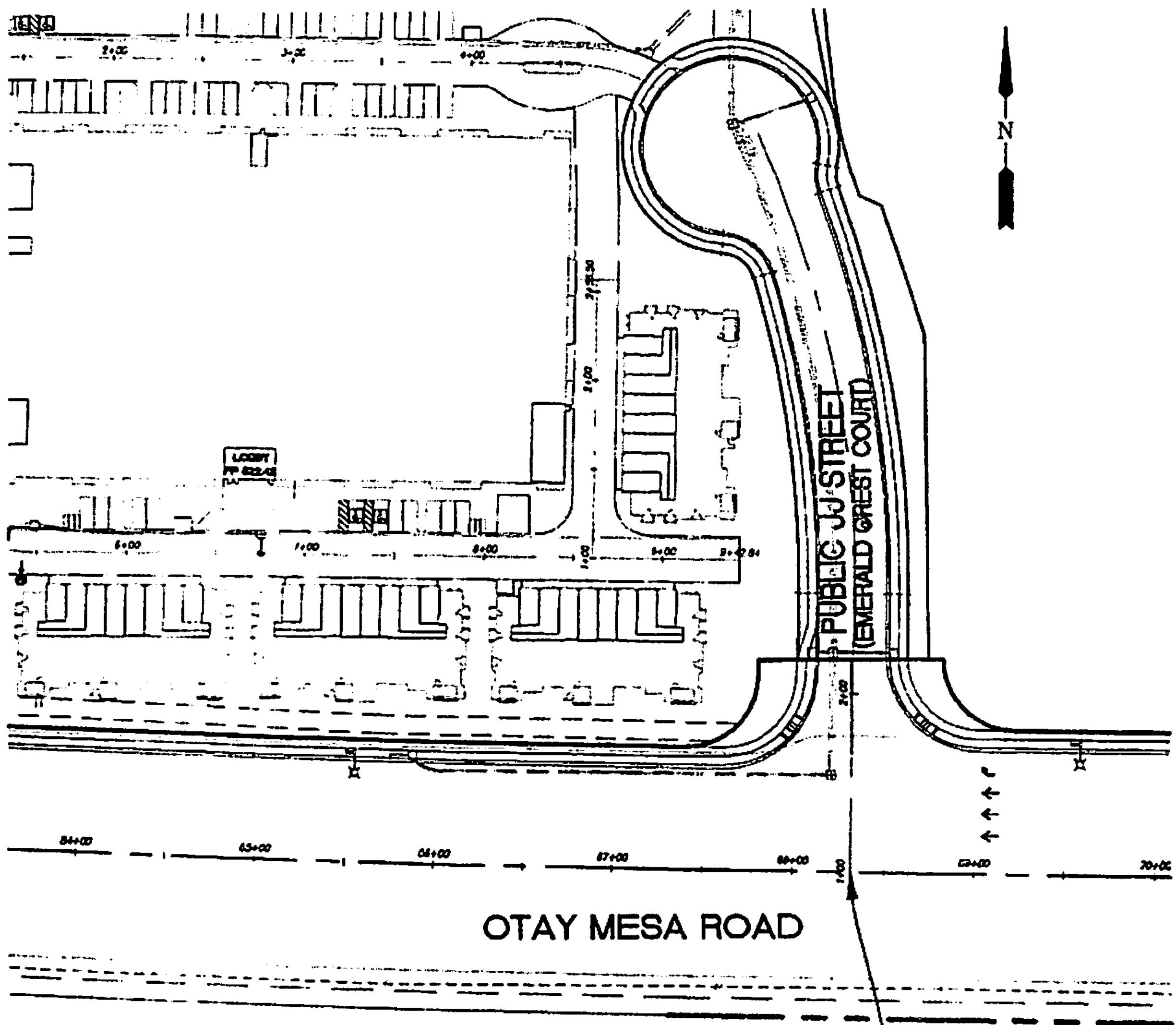
Otay Mesa Road was widened and improved by the City of San Diego from the I-805/I-905 separation to east of La Media Road. Otay Mesa Road was designed and improved to meet State of California design requirements through a Cooperative Agreement recorded December 10, 1996, per File No. RR-288209, and will be under the State of California jurisdiction until SR-905 is constructed between I-805 and SR-125. The intersection spacing for traffic signal systems per the State of California requirements is ½ mile, which differs from the ¼ mile spacing the City of San Diego allows. Since the roadway is now under the State's jurisdiction, the traffic signal system at Emerald Crest Court is not allowed due to the State's signal spacing requirements and, therefore cannot be constructed consistent with Condition No. 46 until such time as the City regains jurisdiction over Otay Mesa Road from the State.

EXHIBIT "C"

INTERSECTION DIAGRAM

EXHIBIT "D"

GREENFIELD VILLAGE
CALIFORNIA TERRACES 13/14
SEE DRAWING NO. 34078-D AND 34089-D



PROPOSED FUTURE TRAFFIC SIGNAL PER
DEFERRED IMPROVEMENT AGREEMENT

NOT TO SCALE

CITY W.O. 425735
DWG. NO. 34078-D AND 34089-D

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Environmental | Engineering | Survey
701 B Street, Suite 800 San Diego, CA 92101
619.235.6471 Tel 619.234.0349 Fax

EXHIBIT "D"

BOND ESTIMATE

JJ Street Traffic Signal Improvement DIA Bond Estimate

WORK ORDER NO: 425735

DWG. NO:

PROJECT DESIGN CONSULTANTS

701 'B' STREET, SUITE 800
SAN DIEGO, CA 92101
(619) 235 - 6471
(619) 234 - 0349

P.T.S. NO: 100657

COMPANY JOB NO: 2255.1
DATE: 4/11/2006

PUBLIC IMPROVEMENT TOTALS

DRAINAGE IMPROVEMENTS	$	-
WATER & WASTEWATER UTILITIES	$	-
SURFACE IMPROVEMENTS	$	-
TRAFFIC	$	135,000
MISCELLANEOUS	$	-
SUBTOTAL - IMPROVEMENTS	$	135,000
20% Contingency	$	27,000
TOTAL PUBLIC IMPROVEMENT:	$	162,000
TOTAL BOND AMOUNT:	$	162,000

A Bond in the amount of $ 162,000 will satisfy the provisions of Article 9, Chapter XII of The Municipal Code for the improvement of JJ Street Traffic Signal

Estimated time of completion Is:

Date

Control Engineer

Engineer of Work 11-1-06 Date

RCE: 59285 Expiration: 6/30/07

REGISTERED PROFESSIONAL ENGINEER
CURTIS J. TURNER
No. 59285
Exp 6/30/07
CIVIL
STATE OF CALIFORNIA

Note: Unit prices are based on available City of San Diego Land Development Review Division, Cost Estimate Unit Price List, August 2005.

CITY OF SAN DIEGO
CONSTRUCTION COST ESTIMATE

DESCRIPTION	UNIT	LUMP SUM	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
SECTION 4-PUBLIC TRAFFIC					
TRAFFIC CONTROLS					
TRAFFIC SIGNAL (4X6 INTERSECTION)	LS		1	$ 130,000.00	$ 130,000
TRENCH RESURFACING, PER SDG-107&108	LF		200	$ 25.00	$ 5,000
				SUBTOTAL:	$ 135,000
				SECTION 4 TOTAL:	$ 135,000

2255.10HondEst-DIA.xls | Page 1 of 1 | 11/1/2006

EXHIBIT "E"

PERFORMANCE BOND

Agency CORPORATE INSURANCE AGENCY, INC.

Address PO BOX 5815

PARSIPPANY, NJ 07054-6815

California Terraces PA 13 / 14 Traffic

(Subdivision Name)

W.O. No. 425735

Bond No. 5017525

Premium $ 2,430

PERFORMANCE BOND

Pursuant to Section 66499 of the Government Code

KNOW ALL MEN BY THESE PRESENTS: That OTAY GREENFIELD DEVELOPERS, LLC A CALIFORNIA LIMITED LIABILITY CO. as, and hereinafter without regard to gender and number, called PRINCIPAL,

and BOND SAFEGUARD INSURANCE CO. a corporation authorized to do business in the State of California and presently possessed of authority under Title 6 of the United States Code to do business under Sections 6 to 13 thereof, in the aggregate amounts hereof, as SURETY, are held and firmly bound unto THE CITY OF SAN DIEGO, a municipal corporation in the County of San Diego, State of California, in the sum of ONE HUNDRED SIXTY TWO THOUSAND & 00/100

100% DOLLARS $ 162,000.00, for the faithful performance of a certain contract hereinafter referred to; and are held and firmly bound unto the State of California for the benefit of the Unemployment Insurance Fund, to the extent that the State of California is interested, and for the benefit of the contractor, subcontractor and to persons renting equipment or furnishing labor or materials hereinafter referred to, or their assigns in the sum of

50% DOLLARS $ ________________, for the payment of which sums well and truly to be made, the said Principal and the said Surety hereby bind themselves and all and singularly their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

Signed, sealed with our seals, and dated this 3RD day of JANUARY, 20 07

THE CONDITION OF THIS OBLIGATION for faithful performance is such that if the said Principal shall faithfully perform the covenants, conditions and agreements contained in a certain contract to be made between said Principal and THE CITY OF SAN DIEGO, and which said contract is dated 12/20/06, and identified as Project 425735 ________________, hereby referred to and made a part hereof, and shall furnish materials in compliance with the specifications and perform all that certain work and improvement in said City which is more particularly described in said contract, to which contract reference is hereby made for further particulars, then the obligation with respect to the faithful performance of said contract shall be void, otherwise to remain in full force and effect.

THE CONDITION OF THIS OBLIGATION for securing payment to contractor, subcontractor, and to persons renting equipment or furnishing labor or materials is such that if the said Principal or its heirs, executors, administrators, successors and assigns shall fail to pay for any materials, provisions, provender, or other supplies used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act, with respect to such work or labor, then said Surety will pay the same in, or to an amount not exceeding the amount herein above specified to be for the benefit of contractor, subcontractor, and to persons renting equipment or furnishing labor or materials, and also will pay, in case suit is brought upon this bond, such reasonable attorney's fee as shall be fixed by the court, awarded and taxed as provided by law.

This bond, to the extent of the obligation hereof with respect to contractor, subcontractor, and to persons renting equipment or furnishing labor or materials, shall inure to the benefit of any and all persons, companies and corporations entitled to file claims under Title 15 (commencing with Section 3082) of Part 4 of Division 3 of the Civil Code of the State of California, so as to give a right of action to them or their assigns to any suit brought upon this bond.

This bond, to the extent of the obligation securing payment to the contractor, subcontractor, and to persons renting equipment or furnishing labor or materials may, sixty days after the recording of Notice of Completion and Acceptance of Subdivision Improvement Agreement be reduced to an amount no less than the total of all claims on which an action has been filed and notice thereof given in writing to the governing body, and if there are no actions filed, this portion of the bond may be released in full.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in no wise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

IN WITNESS WHEREOF, the said Principal and Surety have executed this instrument the day and year first hereinabove written.

Otay Greenfield Developers, LLC, a
California limited liability company
(Principal)
By: National Safe Harbor Exchanges,
a California corporation
Its: Sole Member
By:
Name: Karin A. Church
Its: Vice President

BOND SAFEGUARD INSURANCE CO.
(Surety)
By
KEITH B. ADAMS, ATTORNEY-IN-FACT

NOTE: Notary acknowledgments (for all signatures) must be attached, per civil Code 1180 et. Seq.

APPROVED:

City Manager

BOND SAFEGUARD INSURANCE COMPANY
FINANCIAL STATEMENTS
AS OF DECEMBER 31, 2005

ASSETS	
Bonds	$19,229,612
Money Market &/or Stocks	0
Cash and Short-Term Investments	4,123,293
Agents Balances &/or Uncollected Premiums	2,978,394
Investment Income Due & Accrued	543,888
Funds Held or Deposited with Reinsurance Companies	0
Receivable from Parent, Subsidiaries and Affiliates	0
Reinsurance Recoverable on Loss Payments	34,542
Other Assets	1,062,624
Total Assets	$27,957,354

LIABILITIES	
Reserve for Losses and Loss Expense	$2,069,694
Reserve for Unearned Premiums	10,220,650
Reserve for Other Expenses	171,317
Reserve for Taxes, Licenses, and Fees	159,327
Reserve for Current federal income taxes	681,323
Ceded Reinsurance Premiums Payable	824,951
Funds Held Under Reinsurance Treaty	104,958
Reserve for Unauthorized Reinsurance	3,330
Payable to Parent, Subsidiaries and Affiliates	65,132
Other Liabilities	448,306
Total Liabilities	$14,338,898
POLICYHOLDERS' SURPLUS	
Capital Stock & Paid In Surplus	$3,049,530
Surplus	10,578,928
Total Policyholder Surplus	$13,628,458
Total Liabilities and Policyholder Surplus	$27,967,354

CERTIFICATE

I certify that the above financial statements to the best of my knowledge are a true and accurate reflection of the financial condition of the Company as of December 31, 2005. Additionally, I certify that the above financial statements are in agreement with the Statutory Financial Statements filed with the Illinois Department of Insurance as of the same date.

Chief Financial Officer, Vice President & Assistant Treasurer

POWER OF ATTORNEY AO 40062

Bond Safeguard INSURANCE COMPANY

KNOW ALL MEN BY THESE PRESENTS, that **BOND SAFEGUARD INSURANCE COMPANY**, an Illinois Corporation with its principal office in Lombard, Illinois, does hereby constitute and appoint: Debra J. Ezra, Keith B. Adams, Robert G. Lull, **************** Bradley W. Post, Shawn K. Young ** its true and lawful Attorney(s)-In-Fact to make, execute, seal and deliver for, and on its behalf as surely, any and all bonds, undertakings or other writings obligatory in nature of a bond.

This authority is made under and by the authority of a resolution which was passed by the Board of Directors of **BOND SAFEGUARD INSURANCE COMPANY** on the 7th day of November, 2001 as follows:

Resolved, that the President of the Company is hereby authorized to appoint and empower any representative of the Company or other person or persons as Attorney-In-Fact to execute on behalf of the Company any bonds, undertakings, policies, contracts of indemnity or other writings obligatory in nature of a bond not to exceed $1,000,000.00, One Million Dollars, which the Company might execute through its duly elected officers, and affix the seal of the Company thereto. Any said execution of such documents by an Attorney-In-Fact shall be as binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company. Any Attorney-In-Fact, so appointed, may be removed for good cause and the authority so granted may be revoked as specified in the Power of Attorney.

Resolved, that the signature of the President and the seal of the Company may be affixed by facsimile on any power of attorney granted, and the signature of the Vice President, and the seal of the Company may be affixed by facsimile to any certificate of any such power and any such power or certificate bearing such facsimile signature and seal shall be valid and binding on the Company. Any such power so executed and sealed and certificate so executed and sealed shall, with respect to any bond or undertaking to which it is attached, continue to be valid and binding on the Company.

IN WITNESS THEREOF, **BOND SAFEGUARD INSURANCE COMPANY** has caused this instrument to be signed by its President, and its Corporate seal to be affixed this 7th day of November, 2001.

BOND SAFEGUARD INSURANCE COMPANY · AN ILLINOIS INSURANCE COMPANY

BOND SAFEGUARD INSURANCE COMPANY

BY ______________________

David E. Campbell
President

ACKNOWLEDGEMENT

On this 7th day of November, 2001, before me, personally came David E. Campbell to me known, who being duly sworn, did depose and say that he is the President of **BOND SAFEGUARD INSURANCE COMPANY**, the corporation described in and which executed the above instrument; that he executed said instrument on behalf of the corporation by authority of his office under the By-laws of said corporation.

"OFFICIAL SEAL"
MICHELE KOLLER
Notary Public, State of Illinois
My Commission Expires 08/28/07

Michele Koller
Michele Koller
Notary Public

CERTIFICATE

I, the undersigned, Secretary of **BOND SAFEGUARD INSURANCE COMPANY**, An Illinois Insurance Company, DO HEREBY CERTIFY that the original Power of Attorney of which the foregoing is a true and correct copy, is in full force and effect and has not been revoked and the resolutions as set forth are now in force.

Signed and Sealed at Lombard, Illinois this 3rd Day of January, 20 07

BOND SAFEGUARD INSURANCE COMPANY · AN ILLINOIS INSURANCE COMPANY

Donald D. Buchanan
Donald D. Buchanan
Secretary

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Janet Groneberg, a Notary Public for the aforesaid County and State certify that Karin A. Church personally came before me this day and acknowledged that she is a Vice President of National Safe Harbor Exchanges, a California corporation, the sole member of Otay Greenfield Developers, LLC, an California limited liability company, and that by authority duly given and as the act of the corporation, the foregoing instrument was signed in its name by Karin A. Church, as the Vice President. Witness my hand and official seal this 12th day of January, 2007.

My commission Expires:

Janet Groneberg
Notary Public

March 1, 2010

OFFICIAL SEAL
JANET GRONEBERG
NOTARY PUBLIC - State of Arizona
PINAL COUNTY
My Comm. Expires March 1, 2010

WRITTEN CONSENT OF THE MEMBER
OF
OTAY GREENFIELD DEVELOPERS, LLC,
A CALIFORNIA LIMITED LIABILITY COMPANY

The undersigned, constituting the sole Member of OTAY GREENFIELD DEVELOPERS, LLC, a California limited liability company (the "Company"), hereby adopts, confirms and ratifies the following resolutions by its approval and execution of this Written Consent:

WHEREAS, the Company plans to acquire that certain real property located in the City of San Diego, County of San Diego, State of California known as Planning Areas 13 and 14 in the Ocean View Hills community ("Property"), and desires to construct improvements on the Property;

WHEREAS, the Company is entering into that certain Project Management Agreement between the Company and Garden Communities, a California corporation ("Garden"), whereby Garden will act as Project Manager for the construction of the improvements on the Property;

NOW, THEREFORE, BE IT RESOLVED, that Karin A. Church, as the Vice President of National Safe Harbor Exchanges, a California corporation ("NSHE"), as the sole Member of Company, is hereby authorized, empowered and directed to execute and sign on behalf of the Company all regulatory applications, maps and all documents necessary to obtain permits with the City of San Diego; negotiate, execute, and perform any contracts desirable, useful, or necessary to the conduct of the business or operations of the Company, including, but not limited to, construction agreements and all other documents that are relevant or incident to the construction of properties owned by the Company;

RESOLVED FURTHER, that Company hereby authorizes Karin A. Church, as the Vice President of NSHE, as the sole Member of Company, to execute the City of San Diego Deferred Improvement Agreement, Subdivision Improvement Agreement and to post bonds for the deferred improvement, grading and public/private improvements;

RESOLVED FURTHER, that Stuart Posnock, as Vice President of Garden, is hereby authorized, empowered and directed to take all actions necessary to fulfill Garden's obligations as Project Manager under the Project Management Agreement, including negotiating, executing (where a signature is not required by Company as the owner of the Property), and performing any contracts desirable, useful, or necessary to the construction of the improvements on the Property, including, but not limited to, construction agreements and all other documents that are relevant or incident to the construction of the improvements on the Property;

RESOLVED FURTHER, that all lawful acts specifically described in the immediately preceding resolution, undertaken prior to the adoption of such resolution of the Company, are hereby ratified, confirmed and adopted by the Company;

RESOLVED FURTHER, that a copy of this Written Consent shall be placed with the record of the other actions of the Company.

Dated: December 20, 2006

OTAY GREENFIELD DEVELOPERS, LLC,
a California limited liability company

By: National Safe Harbor Exchanges,
a California corporation
Its: Sole Member

By: Karin A. Church
Karin A. Church
Vice President

JJ Street Traffic Signal Improvement DIA Bond Estimate

WORK ORDER NO: 425735

DWG. NO:

PROJECT DESIGN CONSULTANTS

P.T.S. NO: 100657

701 'B' STREET, SUITE 800
SAN DIEGO, CA 92101
(619) 235 - 6471
(619) 234 - 0349

COMPANY JOB NO: 2255.1
DATE: 4/11/2006

PUBLIC IMPROVEMENT TOTALS

DRAINAGE IMPROVEMENTS	$	-
WATER & WASTEWATER UTILITIES	$	-
SURFACE IMPROVEMENTS	$	-
TRAFFIC	$	135,000
MISCELLANEOUS	$	-
SUBTOTAL - IMPROVEMENTS	$	135,000
20% Contingency	$	27,000
TOTAL PUBLIC IMPROVEMENT:	$	162,000
TOTAL BOND AMOUNT:	$	162,000

12/2/06
OK
THOMAS

A Bond in the amount of $ 162,000 will satisfy the provisions of Article 9, Chapter XII of The Municipal Code for the improvement of JJ Street Traffic Signal

Estimated time of completion Is:

Date

Control Engineer

Engineer of Work 11-1-06 Date

RCE: 59285 Expiration: 6/30/07

REGISTERED PROFESSIONAL ENGINEER
CURTIS J. TURNER
No. 59285
Exp. 6/30/07
CIVIL
STATE OF CALIFORNIA

Note: Unit prices are based on available City of San Diego Land Development Review Division. Cost Estimate Unit Price List. August 2005.

CITY OF SAN DIEGO
CONSTRUCTION COST ESTIMATE

DESCRIPTION	UNIT	LINE NO.	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
SECTION 4-PUBLIC TRAFFIC					
TRAFFIC CONTROLS					
TRAFFIC SIGNAL (NEW INSTALLATION)	LS		1	$ [illegible]	$ [illegible]
[illegible]	LF		200	$ 25.00	$ 5,000
				SUBTOTAL:	$ [illegible]
				SECTION 4 TOTAL:	$ [illegible]

[illegible] Page 1 of 1 [illegible]

Appendix Q

Cumulative Project Information

Cumulative Projects (C1…)		***NBL***	***NBT***	***NBR***	***SBL***	***SBT***	***SBR***	***EBL***	***EBT***	***EBR***	***WBL***	***WBT***	***WBR***
1) Oceanview/Starfish	**AM**	**17**	**128**	**19**	**0**	**47**	**0**	**0**	**0**	**8**	**14**	**0**	**0**
C1: 7-11		2	1	2		1				2	2		
C2: Azul+park		5	97	7		29				1	2		
C3: SView Sview-E			10			2							
C4: Cndlight, S-wind			14			4							
C5: Handler		10	5	10		5				5	10		
C6: Arco+Marijuana			1			6							
	PM	**(14)**	**(77)**	**(16)**	**()**	**(131)**	**()**	**()**	**()**	**(17)**	**(20)**	**()**	**()**
C1: 7-11		(1)	(1)	(2)		(1)				(2)	(2)		
C2: Azul+park		(3)	(50)	(4)		(101)				(5)	(8)		
C3: SView Sview-E			(4)			(9)							
C4: Cndlight, S-wind			(6)			(14)							
C5: Handler		(10)	(10)	(10)		(5)				(10)	(10)		
C6: Arco+Marijuana			(6)			(1)							
2) Oceanview/Seadrift	**AM**	**6**	**164**	**0**	**0**	**69**	**0**	**0**	**0**	**5**	**0**	**0**	**0**
C1: 7-11		1	5			5							
C2: Azul+park			109			32							
C3: SView Sview-E			10			2							
C4: Cndlight, S-wind			14			4							
C5: Handler		5	25			20				5			
C6: Arco+Marijuana			1			6							
	PM	**(6)**	**(113)**	**()**	**()**	**(168)**	**()**	**()**	**()**	**(5)**	**()**	**()**	**()**
C1: 7-11		(1)	(5)			(5)							
C2: Azul+park			(57)			(114)							
C3: SView Sview-E			(4)			(9)							
C4: Cndlight, S-wind			(6)			(14)							
C5: Handler		(5)	(35)			(25)				(5)			
C6: Arco+Marijuana			(6)			(1)							
3) Oceanview/DelSol	**AM**	**30**	**85**	**16**	**0**	**50**	**25**	**85**	**0**	**43**	**16**	**0**	**0**
C1: 7-11		6	6	6		6				6	6		
C2: Azul+park		4	24			7	25	85		12			
C3: SView Sview-E			10			2							
C4: Cndlight, S-wind			14			4							
C5: Handler		20	30	10		25				25	10		
C6: Arco+Marijuana			1			6							

	PM	**(59)**	**(75)**	**(16)**	**()**	**(85)**	**(89)**	**(44)**	**()**	**(42)**	**(16)**	**()**	**()**
C1: 7-11		(6)	(6)	(6)		(6)				(6)	(6)		
C2: Azul+park		(13)	(13)			(25)	(89)	(44)		(6)			
C3: SView Sview-E			(4)			(9)							
C4: Cndlight, S-wind			(6)			(14)							
C5: Handler		(40)	(40)	(10)		(30)				(30)	(10)		
C6: Arco+Marijuana			(6)			(1)							
4) Oceanview/SeaFire	**AM**	**41**	**107**	**12**	**0**	**102**	**7**	**24**	**0**	**92**	**22**	**0**	**0**
C1: 7-11			18	2		18					2		
C2: Azul+park		21	4			12	7	24		72			
C3: SView Sview-E			10			2							
C4: Cndlight, S-wind			14			4							
C5: Handler		20	60	10		60				20	20		
C6: Arco+Marijuana			1			6							
	PM	**(106)**	**(137)**	**(12)**	**()**	**(118)**	**(25)**	**(13)**	**()**	**(63)**	**(27)**	**()**	**()**
C1: 7-11			(18)	(2)		(18)					(2)		
C2: Azul+park		(76)	(13)			(6)	(25)	(13)		(38)			
C3: SView Sview-E			(4)			(9)							
C4: Cndlight, S-wind			(6)			(14)							
C5: Handler		(30)	(90)	(10)		(70)				(25)	(25)		
C6: Arco+Marijuana			(6)			(1)							
5) Oceanview/HiddenTrails	**AM**	**0**	**160**	**18**	**0**	**217**	**0**	**0**	**0**	**0**	**28**	**0**	**0**
C1: 7-11			20	8		20					8		
C2: Azul+park			25			85							
C3: SView Sview-E			10			2							
C4: Cndlight, S-wind			14			4							
C5: Handler			90	10		100					20		
C6: Arco+Marijuana			1			6							
	PM	**()**	**(255)**	**(35)**	**()**	**(208)**	**()**	**()**	**()**	**()**	**(45)**	**()**	**()**
C1: 7-11			(20)	(5)		(20)					(5)		
C2: Azul+park			(89)			(44)							
C3: SView Sview-E			(4)			(9)							

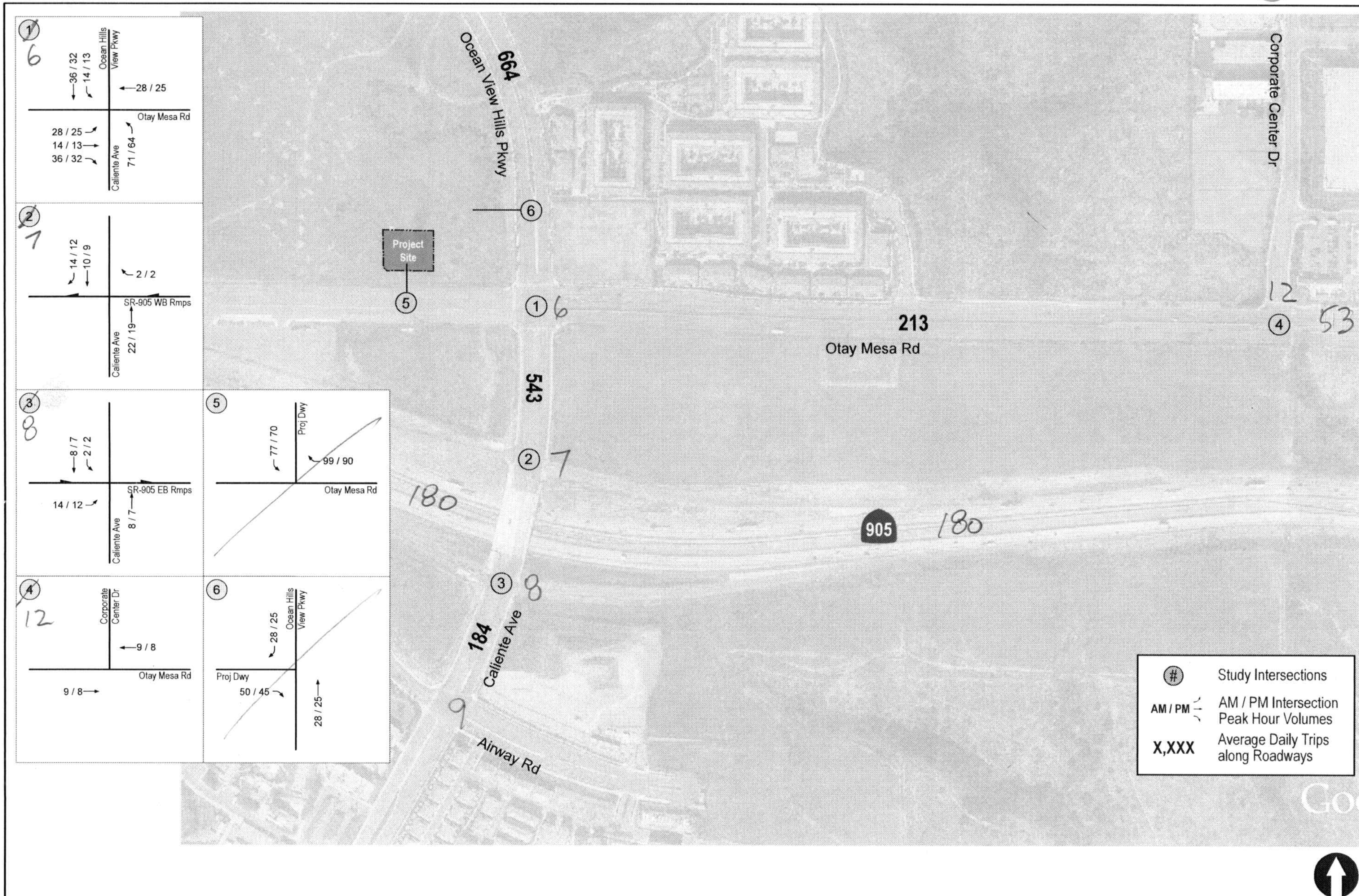
C4: Cndlight, S-wind		(6)			(14)							
C5: Handler		(130)	(30)		(120)					(40)		
C6: Arco+Marijuana		(6)			(1)							
6) OtayMesa/Caliente/Ocear AM	**78**	**35**	**179**	**188**	**78**	**0**	**28**	**46**	**60**	**96**	**52**	**115**
C1: 7-11	71			14	36		28	14	36		28	
C2: Azul+park	7	11		48	36			12	24		4	14
C3: SView Sview-E		10	40		2					10		
C4: Cndlight, S-wind		14	61		4					15		
C5: Handler			53	120				20		69	20	100
C6: Arco+Marijuana			25	6						2		1
PM	**(89)**	**(48)**	**(141)**	**(199)**	**(74)**	**()**	**(25)**	**(49)**	**(45)**	**(182)**	**(68)**	**(217)**
C1: 7-11	(64)			(13)	(32)		(25)	(13)	(32)		(25)	
C2: Azul+park	(25)	(38)		(25)	(19)			(6)	(13)		(13)	(51)
C3: SView Sview-E		(4)	(17)		(9)					(41)		
C4: Cndlight, S-wind		(6)	(26)		(14)					(61)		
C5: Handler			(92)	(160)				(30)		(58)	(30)	(160)
C6: Arco+Marijuana			(6)	(1)						(22)		(6)
7) Caliente/SR905 WB Ramp AM	**165**	**239**	**0**	**0**	**112**	**74**	**0**	**0**	**0**	**12**	**0**	**6**
C1: 7-11		22	x	x	10	14	x	x	x			2
C2: Azul+park		14	x	x	12	48	x	x	x			4
C3: SView Sview-E	67	50	x	x	12		x	x	x	5		
C4: Cndlight, S-wind	98	75	x	x	19		x	x	x	7		
C5: Handler		53	x	x	59	10	x	x	x			
C6: Arco+Marijuana		25	x	x		2	x	x	x			
			x	x			x	x	x			
			x	x			x	x	x			
			x	x			x	x	x			
			x	x			x	x	x			
PM	**(70)**	**(222)**	**()**	**()**	**(189)**	**(69)**	**()**	**()**	**()**	**(51)**	**()**	**(5)**
C1: 7-11		(19)	x	x	(9)	(12)	x	x	x			(2)
C2: Azul+park		(51)	x	x	(6)	(25)	x	x	x			(3)
C3: SView Sview-E	(28)	(21)	x	x	(51)		x	x	x	(20)		
C4: Cndlight, S-wind	(42)	(33)	x	x	(75)		x	x	x	(31)		
C5: Handler		(92)	x	x	(48)	(10)	x	x	x			
C6: Arco+Marijuana		(6)	x	x		(22)	x	x	x			
			x	x			x	x	x			
			x	x			x	x	x			
			x	x			x	x	x			
			x	x			x	x	x			

8) Caliente/SR905 EB Ramp AM	**0**	**341**	**51**	**14**	**110**	**0**	**63**	**0**	**42**	**0**	**0**	**0**
C1: 7-11	x	8		2	8	x	14			x	x	x
C2: Azul+park	x			12		x	14			x	x	x
C3: SView Sview-E	x	117	21		17	x			17	x	x	x
C4: Cndlight, S-wind	x	173	30		26	x			25	x	x	x
C5: Handler	x	43			59	x	10			x	x	x
C6: Arco+Marijuana	x					x	25			x	x	x
	x					x				x	x	x
	x					x				x	x	x
	x					x				x	x	x
	x					x				x	x	x
PM	**()**	**(213)**	**(22)**	**(8)**	**(232)**	**()**	**(79)**	**()**	**(164)**	**()**	**()**	**()**
C1: 7-11	x	(7)		(2)	(7)	x	(12)			x	x	x
C2: Azul+park	x			(6)		x	(51)			x	x	x
C3: SView Sview-E	x	(49)	(9)		(71)	x			(65)	x	x	x
C4: Cndlight, S-wind	x	(75)	(13)		(106)	x			(99)	x	x	x
C5: Handler	x	(82)			(48)	x	(10)			x	x	x
C6: Arco+Marijuana	x					x	(6)			x	x	x
	x					x				x	x	x
	x					x				x	x	x
	x					x				x	x	x
	x					x				x	x	x
9) Caliente/Airway AM	**30**	**220**	**0**	**57**	**72**	**23**	**17**	**5**	**8**	**0**	**21**	**155**
C1: 7-11		8			8							
C2: Azul+park												
C3: SView Sview-E				34				5			21	138
C4: Cndlight, S-wind	30	203			51				8			
C5: Handler		9		23	13	23	17					17
C6: Arco+Marijuana												
PM	**(13)**	**(117)**	**()**	**(155)**	**(222)**	**(19)**	**(30)**	**(20)**	**(31)**	**()**	**(9)**	**(88)**
C1: 7-11		(7)			(7)							
C2: Azul+park												
C3: SView Sview-E				(136)				(20)			(9)	(58)
C4: Cndlight, S-wind	(13)	(88)			(205)				(31)			
C5: Handler		(22)		(19)	(10)	(19)	(30)					(30)
C6: Arco+Marijuana												
10) OtayMesa/Proj W Dwy AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**413**	**0**	**0**	**0**	**0**
C1: 7-11								28				
C2: Azul+park								60				
C3: SView Sview-E								40				
C4: Cndlight, S-wind								61				
C5: Handler								193				
C6: Arco+Marijuana								31				

	PM	**()**	**()**	**()**	**()**	**()**	**()**	**()**	**(368)**	**()**	**()**	**()**	**()**
C1: 7-11									(25)				
C2: Azul+park									(31)				
C3: SView Sview-E									(17)				
C4: Cndlight, S-wind									(26)				
C5: Handler									(262)				
C6: Arco+Marijuana									(7)				
11) OtayMesa/Emerald/Proj	**AM**	**76**	**3**	**25**	**0**	**3**	**19**	**19**	**317**	**77**	**17**	**168**	**0**
C1: 7-11							19	19	9			9	
C2: Azul+park									60			18	
C3: SView Sview-E									40			10	
C4: Cndlight, S-wind									61			15	
C5: Handler		76	3	25		3	0		116	77	17	113	0
C6: Arco+Marijuana									31			3	
	PM	**(99)**	**(4)**	**(32)**	**()**	**(4)**	**(17)**	**(17)**	**(246)**	**(105)**	**(23)**	**(350)**	**()**
C1: 7-11							(17)	(17)	(8)			(8)	
C2: Azul+park									(31)			(63)	
C3: SView Sview-E									(17)			(41)	
C4: Cndlight, S-wind									(26)			(61)	
C5: Handler		(99)	(4)	(32)		(4)	()		(157)	(105)	(23)	(149)	()
C6: Arco+Marijuana									(7)			(28)	
12) OtayMesa/Corporate	**AM**	**113**	**10**	**48**	**0**	**11**	**3**	**35**	**191**	**116**	**56**	**69**	**0**
C1: 7-11									9			9	
C2: Azul+park									60			18	
C3: SView Sview-E									40			10	
C4: Cndlight, S-wind									61			15	
C5: Handler		113	10	48		11	3	4	21	116	56	14	
C6: Arco+Marijuana								31				3	
	PM	**(149)**	**(13)**	**(63)**	**()**	**(15)**	**(4)**	**(12)**	**(109)**	**(157)**	**(76)**	**(220)**	**()**
C1: 7-11									(8)			(8)	
C2: Azul+park									(31)			(63)	
C3: SView Sview-E									(17)			(41)	
C4: Cndlight, S-wind									(26)			(61)	

C5: Handler	(149)	(13)	(63)		(15)	(4)	(5)	(27)	(157)	(76)	(19)	
C6: Arco+Marijuana							(7)				(28)	
13) OtayMesa/Innovative Dr AM	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**239**	**0**	**0**	**147**	**25**
C1: 7-11												
C2: Azul+park												
C3: SView Sview-E												
C4: Cndlight, S-wind												
C5: Handler												
C6: Arco+Marijuana						3						25
PM	**()**	**()**	**()**	**()**	**()**	**(28)**	**()**	**173**	**()**	**()**	**275**	**(6)**
C1: 7-11												
C2: Azul+park												
C3: SView Sview-E												
C4: Cndlight, S-wind												
C5: Handler												
C6: Arco+Marijuana						(28)						(6)
14) OtayMesa/Heritage AM	**25**	**1**	**10**	**3**	**1**	**30**	**42**	**165**	**32**	**5**	**92**	**0**
C1: 7-11	2					2	2	5	2		5	
C2: Azul+park						5	10	50			13	
C3: SView Sview-E	3					3	10	20	10		4	
C4: Cndlight, S-wind								61			15	
C5: Handler	20					20	20	29	20		30	
C6: Arco+Marijuana		1	10	3	1					5	25	
PM	**(42)**	**(1)**	**(10)**	**(22)**	**(1)**	**(55)**	**(37)**	**(104)**	**(32)**	**(5)**	**(178)**	**()**
C1: 7-11	(2)					(2)	(2)	(5)	(2)		(5)	
C2: Azul+park						(13)	(5)	(26)			(50)	
C3: SView Sview-E	(10)					(10)	(5)	(7)	(5)		(21)	
C4: Cndlight, S-wind								(26)			(61)	
C5: Handler	(30)					(30)	(25)	(40)	(25)		(35)	
C6: Arco+Marijuana		(1)	(10)	(22)	(1)					(5)	(6)	

7-11 STORE



LINSCOTT LAW & GREENSPAN engineers

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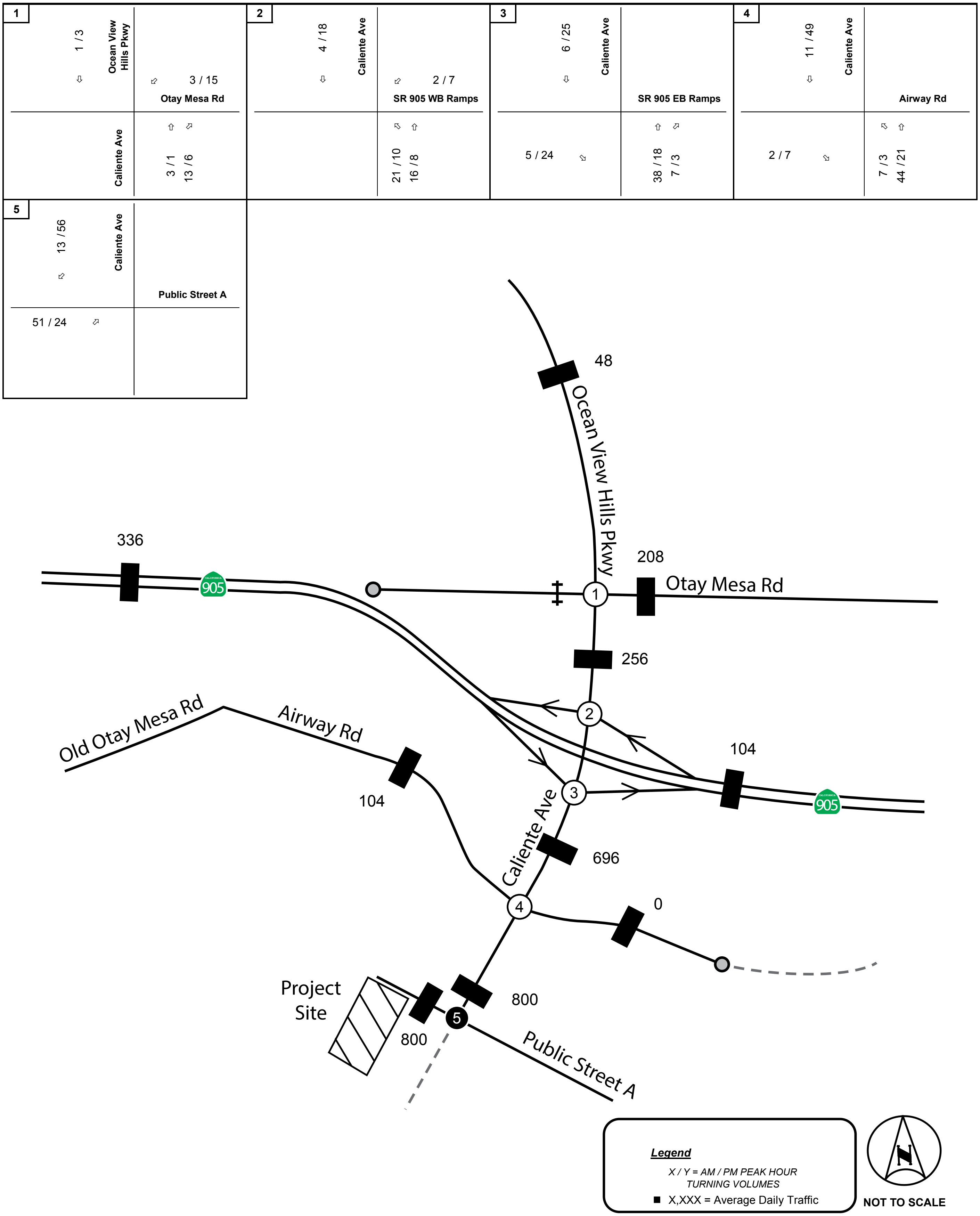
Date: 11/20/17

Figure 7-2

Project Traffic Volumes

OCEAN VIEW HILLS - 7-ELEVEN

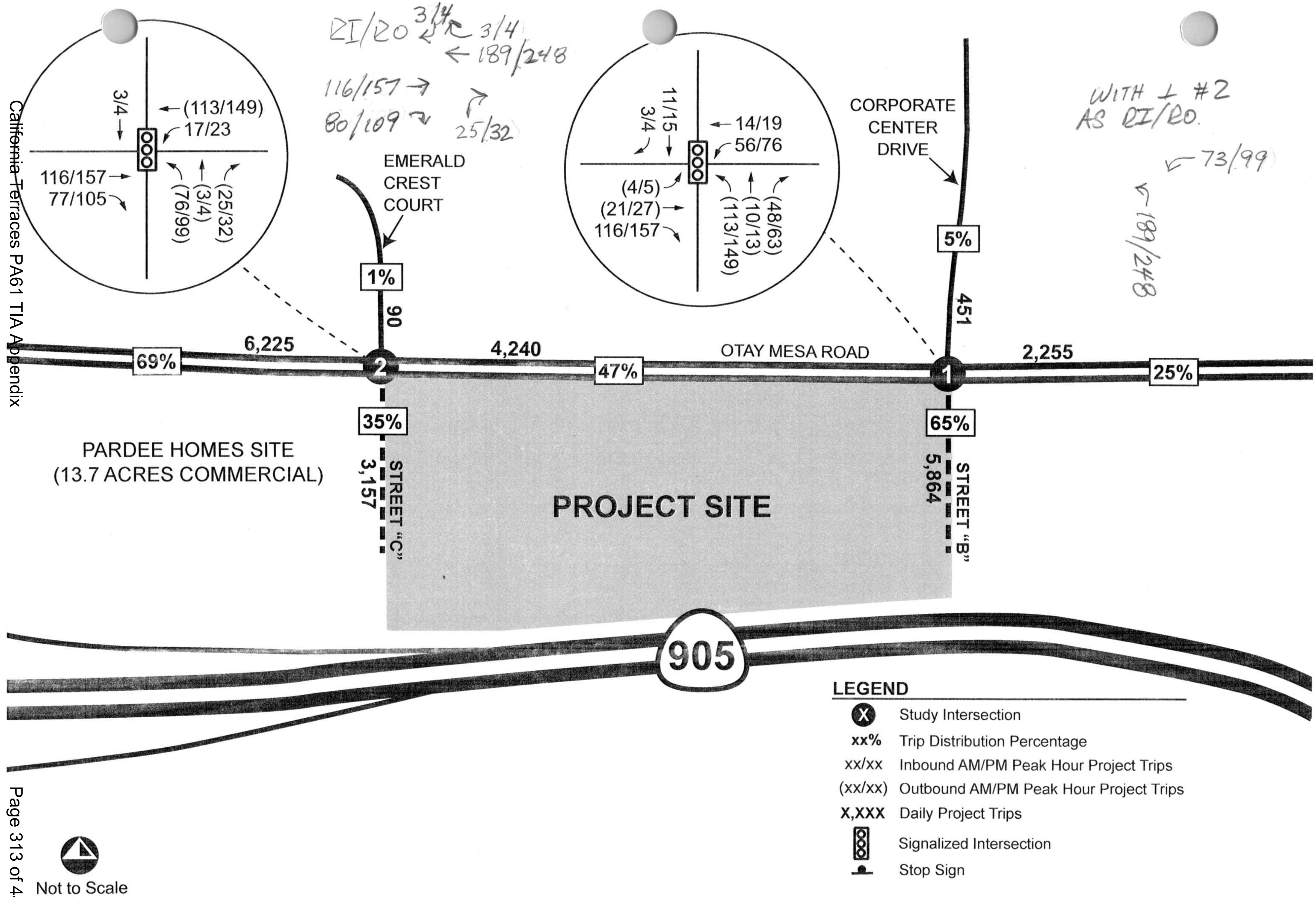
Southwind



Kimley»Horn

FIGURE 4-3

Existing and Near Term Conditions Project Trip Assignment



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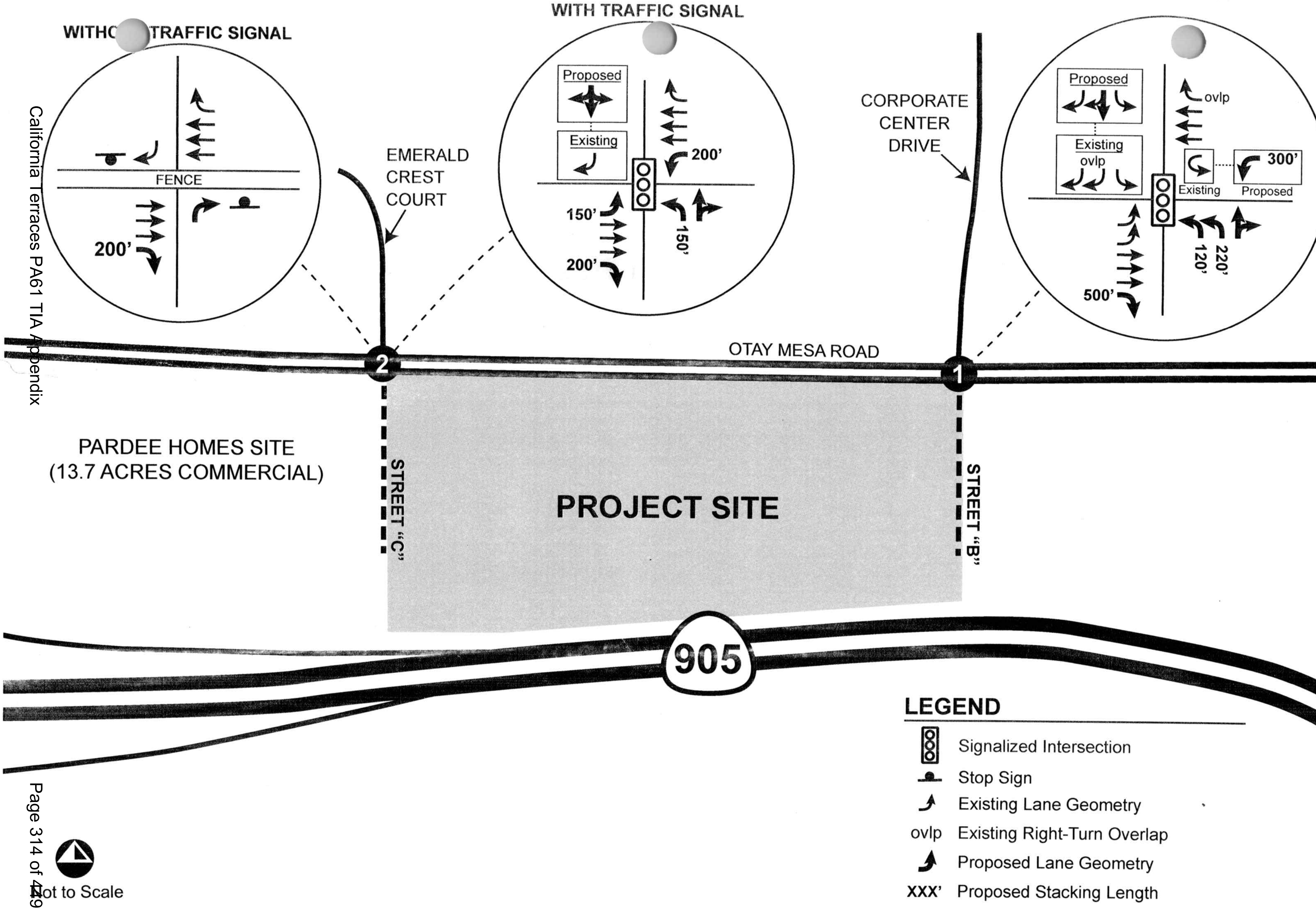
PROJECT TRIP DISTRIBUTION AND TRIP ASSIGNMENT WITH TRAFFIC SIGNAL AT OTAY MESA RD/STREET "C"

EXHIBIT 5



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PROPOSED INTERSECTION LANE CONFIGURATION

EXHIBIT 1

Appendix R

Near Term Year 2020 without Project Level of Service Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	4	12	82	7	53	19	670	47	42	590	22
Future Volume (veh/h)	60	4	12	82	7	53	19	670	47	42	590	22
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.98	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	65	4	13	89	8	58	21	728	51	46	641	24
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	128	8	26	123	11	80	35	1303	91	65	1409	53
Arrive On Green	0.09	0.09	0.09	0.13	0.13	0.13	0.02	0.39	0.39	0.04	0.41	0.41
Sat Flow, veh/h	1382	85	276	976	88	636	1774	3350	235	1774	3475	130
Grp Volume(v), veh/h	82	0	0	155	0	0	21	384	395	46	326	339
Grp Sat Flow(s),veh/h/ln	1744	0	0	1700	0	0	1774	1770	1815	1774	1770	1835
Q Serve(g_s), s	2.5	0.0	0.0	4.9	0.0	0.0	0.7	9.5	9.6	1.4	7.6	7.6
Cycle Q Clear(g_c), s	2.5	0.0	0.0	4.9	0.0	0.0	0.7	9.5	9.6	1.4	7.6	7.6
Prop In Lane	0.79		0.16	0.57		0.37	1.00		0.13	1.00		0.07
Lane Grp Cap(c), veh/h	162	0	0	215	0	0	35	688	706	65	718	744
V/C Ratio(X)	0.51	0.00	0.00	0.72	0.00	0.00	0.60	0.56	0.56	0.71	0.45	0.46
Avail Cap(c_a), veh/h	836	0	0	815	0	0	132	688	706	129	718	744
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	0.0	0.0	23.6	0.0	0.0	27.4	13.4	13.4	26.8	12.2	12.2
Incr Delay (d2), s/veh	2.4	0.0	0.0	4.5	0.0	0.0	15.0	3.3	3.2	13.4	2.1	2.0
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	1.3	0.0	0.0	2.6	0.0	0.0	0.5	5.2	5.3	0.9	4.0	4.2
LnGrp Delay(d),s/veh	26.7	0.0	0.0	28.2	0.0	0.0	42.3	16.7	16.6	40.3	14.3	14.2
LnGrp LOS	C			C			D	B	B	D	B	B
Approach Vol, veh/h		82			155			800			711	
Approach Delay, s/veh		26.7			28.2			17.3			15.9	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	28.6		12.0	6.5	27.7		10.1				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	4.2	* 22		27.0	4.1	21.9		27.0				
Max Q Clear Time (g_c+I1), s	2.7	9.6		6.9	3.4	11.6		4.5				
Green Ext Time (p_c), s	0.0	3.0		0.7	0.0	3.2		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			18.2									
HCM 2010 LOS			B									
Notes												

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	82	31	14	684	563	90
Future Vol, veh/h	82	31	14	684	563	90
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	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	89	34	15	743	612	98

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1079	371	718	0	-	0
Stage 1	669	-	-	-	-	-
Stage 2	410	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	213	626	879	-	-	-
Stage 1	471	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	206	618	873	-	-	-
Mov Cap-2 Maneuver	332	-	-	-	-	-
Stage 1	460	-	-	-	-	-
Stage 2	634	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	18.9		0.2		0	
HCM LOS	C					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	873	-	380	-	-
HCM Lane V/C Ratio	0.017	-	0.323	-	-
HCM Control Delay (s)	9.2	-	18.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	390	22	399	19	36	33	348	270	29	18	267	302
Future Volume (veh/h)	390	22	399	19	36	33	348	270	29	18	267	302
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.97		0.98	1.00		0.97	1.00		0.98
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	424	24	434	21	39	36	378	293	32	20	290	328
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	623	641	521	303	157	145	460	1887	201	30	511	448
Arrive On Green	0.21	0.34	0.34	0.04	0.18	0.18	0.13	0.41	0.41	0.02	0.29	0.29
Sat Flow, veh/h	1774	1863	1515	1774	885	817	3442	4654	496	1774	1770	1552
Grp Volume(v), veh/h	424	24	434	21	0	75	378	211	114	20	290	328
Grp Sat Flow(s),veh/h/ln	1774	1863	1515	1774	0	1702	1721	1695	1760	1774	1770	1552
Q Serve(g_s), s	18.7	0.9	26.3	0.9	0.0	3.8	10.7	3.9	4.1	1.1	13.9	19.0
Cycle Q Clear(g_c), s	18.7	0.9	26.3	0.9	0.0	3.8	10.7	3.9	4.1	1.1	13.9	19.0
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	623	641	521	303	0	303	460	1375	714	30	511	448
V/C Ratio(X)	0.68	0.04	0.83	0.07	0.00	0.25	0.82	0.15	0.16	0.66	0.57	0.73
Avail Cap(c_a), veh/h	623	718	584	518	0	579	641	1375	714	99	511	448
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	21.8	30.1	30.9	0.0	35.3	42.1	18.8	18.9	48.8	30.2	32.0
Incr Delay (d2), s/veh	3.0	0.0	9.1	0.1	0.0	0.4	6.0	0.2	0.5	21.9	4.5	10.1
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	9.6	0.4	12.2	0.5	0.0	1.8	5.5	1.9	2.1	0.7	7.4	9.4
LnGrp Delay(d),s/veh	26.6	21.8	39.2	31.0	0.0	35.7	48.0	19.1	19.3	70.7	34.7	42.2
LnGrp LOS	C	C	D	C		D	D	B	B	E	C	D
Approach Vol, veh/h		882			96			703			638	
Approach Delay, s/veh		32.7			34.7			34.7			39.7	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.8	34.4	25.0	22.7	6.1	46.1	8.4	39.3
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	18.6	* 28	20.6	34.0	5.6	40.5	16.1	38.5
Max Q Clear Time (g_c+I1), s	12.7	21.0	20.7	5.8	3.1	6.1	2.9	28.3
Green Ext Time (p_c), s	0.7	2.0	0.0	0.3	0.0	1.9	0.0	1.3

Intersection Summary		
HCM 2010 Ctrl Delay		35.3
HCM 2010 LOS		D

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	96	32	0	42	44	567	18	26	648	11
Future Volume (veh/h)	27	0	96	32	0	42	44	567	18	26	648	11
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.96	1.00		0.95
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	29	0	104	35	0	46	48	616	20	28	704	12
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	43	0	154	87	0	78	64	2446	79	44	2432	41
Arrive On Green	0.12	0.00	0.12	0.05	0.00	0.05	0.04	0.48	0.48	0.02	0.47	0.47
Sat Flow, veh/h	351	0	1258	1774	0	1583	1774	5053	163	1774	5145	88
Grp Volume(v), veh/h	133	0	0	35	0	46	48	412	224	28	463	253
Grp Sat Flow(s),veh/h/ln	1609	0	0	1774	0	1583	1774	1695	1826	1774	1695	1842
Q Serve(g_s), s	5.0	0.0	0.0	1.2	0.0	1.8	1.7	4.5	4.5	1.0	5.3	5.3
Cycle Q Clear(g_c), s	5.0	0.0	0.0	1.2	0.0	1.8	1.7	4.5	4.5	1.0	5.3	5.3
Prop In Lane	0.22		0.78	1.00		1.00	1.00		0.09	1.00		0.05
Lane Grp Cap(c), veh/h	197	0	0	87	0	78	64	1641	884	44	1602	871
V/C Ratio(X)	0.67	0.00	0.00	0.40	0.00	0.59	0.75	0.25	0.25	0.64	0.29	0.29
Avail Cap(c_a), veh/h	789	0	0	898	0	802	213	1641	884	174	1602	871
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	0.0	29.2	0.0	29.4	30.2	9.6	9.6	30.6	10.2	10.2
Incr Delay (d2), s/veh	4.0	0.0	0.0	3.0	0.0	7.0	16.0	0.4	0.7	14.7	0.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	0.7	0.0	0.9	1.1	2.2	2.5	0.7	2.5	2.9
LnGrp Delay(d),s/veh	30.5	0.0	0.0	32.1	0.0	36.5	46.2	9.9	10.3	45.2	10.6	11.0
LnGrp LOS	C			C		D	D	A	B	D	B	B
Approach Vol, veh/h		133			81			684			744	
Approach Delay, s/veh		30.5			34.6			12.6			12.1	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	35.9		8.0	6.0	36.6		12.7
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	7.6	29.2		32.0	6.2	30.6		31.0
Max Q Clear Time (g_c+I1), s	3.7	7.3		3.8	3.0	6.5		7.0
Green Ext Time (p_c), s	0.0	4.2		0.3	0.0	3.7		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	14.9
HCM 2010 LOS	B

LOS Engineering, Inc.

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	79	9	54	647	32	5	719
Future Volume (veh/h)	79	9	54	647	32	5	719
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.96	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	86	10		703	35	5	782
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.92	0.92		0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	120	107		3061	152	10	3641
Arrive On Green	0.07	0.07		0.62	0.62	0.01	0.72
Sat Flow, veh/h	1774	1583		5120	245	1774	5253
Grp Volume(v), veh/h	86	10		480	258	5	782
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1808	1774	1695
Q Serve(g_s), s	2.3	0.3		3.1	3.1	0.1	2.5
Cycle Q Clear(g_c), s	2.3	0.3		3.1	3.1	0.1	2.5
Prop In Lane	1.00	1.00			0.14	1.00	
Lane Grp Cap(c), veh/h	120	107		2095	1117	10	3641
V/C Ratio(X)	0.72	0.09		0.23	0.23	0.52	0.21
Avail Cap(c_a), veh/h	1133	1011		2095	1117	146	3641
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.2	21.2		4.1	4.1	24.1	2.3
Incr Delay (d2), s/veh	7.7	0.4		0.3	0.5	38.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.3		1.5	1.7	0.2	1.2
LnGrp Delay(d),s/veh	29.9	21.6		4.4	4.6	62.3	2.4
LnGrp LOS	C	C		A	A	E	A
Approach Vol, veh/h	96			738			787
Approach Delay, s/veh	29.0			4.5			2.8
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		40.8		7.8	4.8	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		30.0		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		4.5		4.3	2.1	5.1		
Green Ext Time (p_c), s		5.2		0.2	0.0	4.5		

Intersection Summary	
HCM 2010 Ctrl Delay	5.1
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	46	65	353	53	182	83	382	732	340	565	1
Future Volume (veh/h)	28	46	65	353	53	182	83	382	732	340	565	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.97	1.00		0.99	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	30	50	71	384	58	198	90	415	796	370	614	1
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	114	280	228	481	287	238	115	1519	892	443	1746	753
Arrive On Green	0.06	0.08	0.08	0.14	0.15	0.15	0.06	0.43	0.43	0.13	0.49	0.49
Sat Flow, veh/h	1774	3539	1583	3442	1863	1541	1774	3539	1564	3442	3539	1527
Grp Volume(v), veh/h	30	50	71	384	58	198	90	415	796	370	614	1
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1541	1774	1770	1564	1721	1770	1527
Q Serve(g_s), s	1.4	1.2	3.6	9.7	2.4	11.2	4.5	6.8	38.6	9.4	9.6	0.0
Cycle Q Clear(g_c), s	1.4	1.2	3.6	9.7	2.4	11.2	4.5	6.8	38.6	9.4	9.6	0.0
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	114	280	228	481	287	238	115	1519	892	443	1746	753
V/C Ratio(X)	0.26	0.18	0.31	0.80	0.20	0.83	0.78	0.27	0.89	0.84	0.35	0.00
Avail Cap(c_a), veh/h	217	606	373	757	501	414	142	1519	892	474	1746	753
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	0.97	0.97	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	38.7	34.5	37.5	33.2	36.9	41.5	16.6	17.0	38.3	14.0	11.6
Incr Delay (d2), s/veh	1.2	0.3	0.8	3.3	0.3	7.4	19.6	0.4	12.8	11.6	0.6	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	0.7	0.6	1.6	4.9	1.3	5.3	2.8	3.4	20.4	5.2	4.8	0.0
LnGrp Delay(d),s/veh	41.3	39.0	35.3	40.7	33.6	44.4	61.1	17.0	29.9	49.9	14.5	11.6
LnGrp LOS	D	D	D	D	C	D	E	B	C	D	B	B
Approach Vol, veh/h		151			640			1301			985	
Approach Delay, s/veh		37.7			41.2			27.9			27.8	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	43.7	17.8	12.2	10.5	49.5	11.0	19.0
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 13	22.3	* 20	15.4	* 7.2	27.5	* 11	24.2
Max Q Clear Time (g_c+I1), s	11.4	40.6	11.7	5.6	6.5	11.6	3.4	13.2
Green Ext Time (p_c), s	0.1	0.0	0.9	0.3	0.0	3.4	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	31.1
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	33	0	65	441	1051	0	0	358	543
Future Volume (veh/h)	0	0	0	33	0	65	441	1051	0	0	358	543
Number				3	8	18	5	2	12	1	6	16
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		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				36	0	71	479	1142	0	0	389	590
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
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	0	2	2
Cap, veh/h				115	0	103	508	4107	0	0	1568	703
Arrive On Green				0.06	0.00	0.06	0.57	1.00	0.00	0.00	0.46	0.46
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	3558	1521
Grp Volume(v), veh/h				36	0	71	479	1142	0	0	389	590
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1695	1521
Q Serve(g_s), s				1.5	0.0	3.5	20.1	0.0	0.0	0.0	5.6	27.3
Cycle Q Clear(g_c), s				1.5	0.0	3.5	20.1	0.0	0.0	0.0	5.6	27.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				115	0	103	508	4107	0	0	1568	703
V/C Ratio(X)				0.31	0.00	0.69	0.94	0.28	0.00	0.00	0.25	0.84
Avail Cap(c_a), veh/h				342	0	305	628	4107	0	0	1568	703
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	0.00	1.00	0.61	0.61	0.00	0.00	0.90	0.90
Uniform Delay (d), s/veh				35.7	0.0	36.6	16.5	0.0	0.0	0.0	13.1	18.9
Incr Delay (d2), s/veh				1.5	0.0	8.1	14.4	0.1	0.0	0.0	0.3	10.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.8	0.0	1.8	11.3	0.0	0.0	0.0	2.7	13.4
LnGrp Delay(d),s/veh				37.2	0.0	44.7	30.8	0.1	0.0	0.0	13.4	29.4
LnGrp LOS				D		D	C	A			B	C
Approach Vol, veh/h					107			1621			979	
Approach Delay, s/veh					42.2			9.2			23.0	
Approach LOS					D			A			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		69.7			27.6	42.1		10.3
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		54.4			* 28	21.4		15.4
Max Q Clear Time (g_c+I1), s		2.0			22.1	29.3		5.5
Green Ext Time (p_c), s		9.6			0.9	0.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	652	1	528	0	0	0	0	852	110	103	374	0
Future Volume (veh/h)	652	1	528	0	0	0	0	852	110	103	374	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	642	95	574				0	926	120	112	407	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
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				0	2	2	2	2	0
Cap, veh/h	752	97	588				0	1409	182	143	1588	0
Arrive On Green	0.42	0.42	0.42				0.00	0.31	0.31	0.03	0.15	0.00
Sat Flow, veh/h	1774	230	1388				0	4720	588	1774	3632	0
Grp Volume(v), veh/h	642	0	669				0	689	357	112	407	0
Grp Sat Flow(s),veh/h/ln	1774	0	1618				0	1695	1750	1774	1770	0
Q Serve(g_s), s	26.1	0.0	32.5				0.0	14.1	14.2	5.0	8.1	0.0
Cycle Q Clear(g_c), s	26.1	0.0	32.5				0.0	14.1	14.2	5.0	8.1	0.0
Prop In Lane	1.00		0.86				0.00		0.34	1.00		0.00
Lane Grp Cap(c), veh/h	752	0	686				0	1049	542	143	1588	0
V/C Ratio(X)	0.85	0.00	0.98				0.00	0.66	0.66	0.78	0.26	0.00
Avail Cap(c_a), veh/h	752	0	686				0	1049	542	162	1588	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.88	0.88	0.00
Uniform Delay (d), s/veh	20.8	0.0	22.6				0.0	23.9	24.0	38.2	22.3	0.0
Incr Delay (d2), s/veh	9.4	0.0	28.3				0.0	3.2	6.2	17.6	0.3	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
%ile BackOfQ(50%),veh/ln	14.6	0.0	19.7				0.0	7.1	7.8	3.2	4.1	0.0
LnGrp Delay(d),s/veh	30.3	0.0	51.0				0.0	27.1	30.2	55.9	22.6	0.0
LnGrp LOS	C		D					C	C	E	C	
Approach Vol, veh/h		1311						1046			519	
Approach Delay, s/veh		40.8						28.2			29.8	
Approach LOS		D						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	11.1	29.9		39.0		41.0		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 7.3	23.9		33.9		35.9		
Max Q Clear Time (g_c+I1), s	7.0	16.2		34.5		10.1		
Green Ext Time (p_c), s	0.0	3.7		0.0		2.4		

Intersection Summary		
HCM 2010 Ctrl Delay		34.2
HCM 2010 LOS		C

Notes

Intersection	
Intersection Delay, s/veh	104.3
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	382	6	15	0	22	210	34	415	0	90	349	448
Future Vol, veh/h	382	6	15	0	22	210	34	415	0	90	349	448
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	415	7	16	0	24	228	37	451	0	98	379	487
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	32.9	30.4	26.6	195.4
HCM LOS	D	D	D	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	90%	0%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	100%	0%	3%	100%	100%	0%	0%	100%	21%
Vol Right, %	0%	0%	0%	0%	7%	0%	0%	100%	0%	0%	79%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	34	208	208	202	201	0	22	210	90	233	564
LT Vol	34	0	0	202	180	0	0	0	90	0	0
Through Vol	0	208	208	0	6	0	22	0	0	233	116
RT Vol	0	0	0	0	15	0	0	210	0	0	448
Lane Flow Rate	37	226	226	220	218	0	24	228	98	253	613
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.111	0.648	0.539	0.653	0.64	0	0.072	0.648	0.28	0.688	1.569
Departure Headway (Hd)	11.751	11.225	9.399	11.513	11.406	11.784	11.784	11.061	10.311	9.788	9.207
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	307	325	386	317	318	0	306	329	348	369	399
Service Time	9.451	8.925	7.099	9.213	9.106	9.484	9.484	8.761	8.071	7.547	6.966
HCM Lane V/C Ratio	0.121	0.695	0.585	0.694	0.686	0	0.078	0.693	0.282	0.686	1.536
HCM Control Delay	15.9	32.4	22.6	33.5	32.3	14.5	15.4	32	17.1	31.7	291.4
HCM Lane LOS	C	D	C	D	D	N	C	D	C	D	F
HCM 95th-tile Q	0.4	4.2	3.1	4.3	4.1	0	0.2	4.3	1.1	4.9	34.3

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	1022	80	0	497	4	0	0	25	35	0	94
Future Vol, veh/h	19	1022	80	0	497	4	0	0	25	35	0	94
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	-	-	-	-	-	400	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	1111	87	0	540	4	0	0	27	38	0	102

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	544	0	0	-	-	0	-	-	599	1026	-	270
Stage 1	-	-	-	-	-	-	-	-	-	540	-	-
Stage 2	-	-	-	-	-	-	-	-	-	486	-	-
Critical Hdwy	5.34	-	-	-	-	-	-	-	7.14	6.44	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	7.34	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	6.74	-	-
Follow-up Hdwy	3.12	-	-	-	-	-	-	-	3.92	3.82	-	3.92
Pot Cap-1 Maneuver	646	-	-	0	-	-	0	0	381	247	0	620
Stage 1	-	-	-	0	-	-	0	0	-	412	0	-
Stage 2	-	-	-	0	-	-	0	0	-	486	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	646	-	-	-	-	-	-	-	381	212	-	620
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	212	-	-
Stage 1	-	-	-	-	-	-	-	-	-	371	-	-
Stage 2	-	-	-	-	-	-	-	-	-	406	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	15.2	11.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	381	646	-	-	-	-	620
HCM Lane V/C Ratio	0.071	0.032	-	-	-	-	0.165
HCM Control Delay (s)	15.2	10.8	-	-	-	-	11.9
HCM Lane LOS	C	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	-	-	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	511	116	74	266	38	189	10	48	28	11	91
Future Volume (veh/h)	360	511	116	74	266	38	189	10	48	28	11	91
Number	5	2	12	1	6	16	3	8	18	7	4	14
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		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	391	555	126	80	289	41	205	11	52	30	0	107
Adj No. of Lanes	2	3	1	1	3	1	2	1	0	1	0	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	465	928	289	103	564	175	283	36	168	736	0	1416
Arrive On Green	0.14	0.18	0.18	0.06	0.11	0.11	0.08	0.13	0.13	0.42	0.00	0.45
Sat Flow, veh/h	3442	5085	1583	1774	5085	1579	3442	284	1342	1774	0	3127
Grp Volume(v), veh/h	391	555	126	80	289	41	205	0	63	30	0	107
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1579	1721	0	1626	1774	0	1564
Q Serve(g_s), s	10.3	9.3	6.6	4.1	5.0	2.2	5.4	0.0	3.3	0.9	0.0	1.8
Cycle Q Clear(g_c), s	10.3	9.3	6.6	4.1	5.0	2.2	5.4	0.0	3.3	0.9	0.0	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	465	928	289	103	564	175	283	0	204	736	0	1416
V/C Ratio(X)	0.84	0.60	0.44	0.77	0.51	0.23	0.72	0.00	0.31	0.04	0.00	0.08
Avail Cap(c_a), veh/h	519	1820	567	230	1754	545	464	0	280	736	0	1416
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.1	34.8	33.7	43.1	38.9	37.6	41.5	0.0	36.9	16.1	0.0	14.4
Incr Delay (d2), s/veh	10.8	0.6	1.0	11.6	0.7	0.7	3.5	0.0	0.9	0.1	0.0	0.1
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	5.6	4.4	2.9	2.4	2.4	1.0	2.7	0.0	1.5	0.5	0.0	0.8
LnGrp Delay(d),s/veh	50.0	35.4	34.7	54.7	39.6	38.3	45.1	0.0	37.8	16.2	0.0	14.5
LnGrp LOS	D	D	C	D	D	D	D		D	B		B
Approach Vol, veh/h		1072			410			268			137	
Approach Delay, s/veh		40.6			42.4			43.3			14.9	
Approach LOS		D			D			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	24.2	12.1	46.5	16.5	17.6	42.5	16.1
Change Period (Y+Rc), s	4.5	7.3	4.5	* 4.5	4.0	* 7.3	4.0	4.5
Max Green Setting (Gmax), s	12.0	33.2	12.5	* 42	14.0	* 32	38.5	16.0
Max Q Clear Time (g_c+I1), s	6.1	11.3	7.4	3.8	12.3	7.0	2.9	5.3
Green Ext Time (p_c), s	0.1	3.7	0.3	0.4	0.3	1.8	0.1	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	39.5
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	669	3	0	419	59	0	0	5	0	0	50
Future Vol, veh/h	0	669	3	0	419	59	0	0	5	0	0	50
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	727	3	0	455	64	0	0	5	0	0	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	365	-	-	228
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	540	0	0	660
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	540	-	-	660
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.7	10.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	540	-	-	-	-	660
HCM Lane V/C Ratio	0.01	-	-	-	-	0.082
HCM Control Delay (s)	11.7	-	-	-	-	10.9
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	283	137	42	229	116	79	34	48	89	24	93
Future Volume (veh/h)	168	283	137	42	229	116	79	34	48	89	24	93
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	183	308	149	46	249	126	86	37	52	97	26	101
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	278	891	274	114	650	202	111	300	421	124	816	1220
Arrive On Green	0.08	0.18	0.18	0.03	0.13	0.13	0.06	0.43	0.43	0.07	0.44	0.44
Sat Flow, veh/h	3442	5085	1564	3442	5085	1583	1774	696	978	1774	1863	2787
Grp Volume(v), veh/h	183	308	149	46	249	126	86	0	89	97	26	101
Grp Sat Flow(s),veh/h/ln	1721	1695	1564	1721	1695	1583	1774	0	1674	1774	1863	1393
Q Serve(g_s), s	3.8	3.9	6.4	1.0	3.3	5.5	3.5	0.0	2.3	3.9	0.6	1.5
Cycle Q Clear(g_c), s	3.8	3.9	6.4	1.0	3.3	5.5	3.5	0.0	2.3	3.9	0.6	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.58	1.00		1.00
Lane Grp Cap(c), veh/h	278	891	274	114	650	202	111	0	721	124	816	1220
V/C Ratio(X)	0.66	0.35	0.54	0.40	0.38	0.62	0.77	0.00	0.12	0.78	0.03	0.08
Avail Cap(c_a), veh/h	578	2849	876	212	2307	718	230	0	721	170	816	1220
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	26.5	27.5	34.7	29.3	30.2	33.8	0.0	12.5	33.5	11.7	12.0
Incr Delay (d2), s/veh	2.7	0.2	1.7	2.3	0.4	3.1	10.8	0.0	0.4	14.7	0.1	0.1
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	1.9	1.8	2.9	0.5	1.6	2.6	2.1	0.0	1.1	2.4	0.3	0.6
LnGrp Delay(d),s/veh	35.3	26.7	29.2	36.9	29.6	33.4	44.6	0.0	12.9	48.2	11.8	12.1
LnGrp LOS	D	C	C	D	C	C	D		B	D	B	B
Approach Vol, veh/h		640			421			175			224	
Approach Delay, s/veh		29.8			31.6			28.5			27.7	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	39.4	9.9	15.2	9.1	38.9	6.4	18.7
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	9.5	28.7	12.3	33.2	7.0	* 32	4.5	41.0
Max Q Clear Time (g_c+I1), s	5.5	3.5	5.8	7.5	5.9	4.3	3.0	8.4
Green Ext Time (p_c), s	0.1	0.4	0.3	1.8	0.0	0.4	0.0	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	29.8
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	1	21	33	0	53	18	640	41	147	602	20
Future Volume (veh/h)	14	1	21	33	0	53	18	640	41	147	602	20
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	15	1	23	36	0	58	20	696	45	160	654	22
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	35	2	54	57	0	92	33	1416	91	202	1799	60
Arrive On Green	0.06	0.06	0.06	0.09	0.00	0.09	0.02	0.42	0.42	0.11	0.51	0.51
Sat Flow, veh/h	638	43	978	632	0	1019	1774	3375	218	1774	3493	117
Grp Volume(v), veh/h	39	0	0	94	0	0	20	365	376	160	331	345
Grp Sat Flow(s),veh/h/ln	1658	0	0	1651	0	0	1774	1770	1823	1774	1770	1841
Q Serve(g_s), s	1.4	0.0	0.0	3.4	0.0	0.0	0.7	9.4	9.4	5.5	7.0	7.0
Cycle Q Clear(g_c), s	1.4	0.0	0.0	3.4	0.0	0.0	0.7	9.4	9.4	5.5	7.0	7.0
Prop In Lane	0.38		0.59	0.38		0.62	1.00		0.12	1.00		0.06
Lane Grp Cap(c), veh/h	91	0	0	149	0	0	33	743	765	202	911	948
V/C Ratio(X)	0.43	0.00	0.00	0.63	0.00	0.00	0.60	0.49	0.49	0.79	0.36	0.36
Avail Cap(c_a), veh/h	718	0	0	715	0	0	120	743	765	307	911	948
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	0.0	27.4	0.0	0.0	30.3	13.2	13.2	26.9	9.0	9.0
Incr Delay (d2), s/veh	3.1	0.0	0.0	4.3	0.0	0.0	16.1	2.3	2.3	7.7	1.1	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	0.7	0.0	0.0	1.7	0.0	0.0	0.5	5.0	5.2	3.1	3.7	3.8
LnGrp Delay(d),s/veh	31.6	0.0	0.0	31.7	0.0	0.0	46.4	15.5	15.5	34.6	10.1	10.1
LnGrp LOS	C			C			D	B	B	C	B	B
Approach Vol, veh/h		39			94			761			836	
Approach Delay, s/veh		31.6			31.7			16.3			14.8	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	37.9		10.5	11.5	32.0		8.3
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	4.2	* 32		27.0	10.8	25.2		27.0
Max Q Clear Time (g_c+I1), s	2.7	9.0		5.4	7.5	11.4		3.4
Green Ext Time (p_c), s	0.0	3.8		0.4	0.1	3.5		0.1

Intersection Summary		
HCM 2010 Ctrl Delay		16.8
HCM 2010 LOS		B

Notes

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	27	27	661	615	50
Future Vol, veh/h	37	27	27	661	615	50
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	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	40	29	29	718	668	54

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1128	377	730	0	-	0
Stage 1	703	-	-	-	-	-
Stage 2	425	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	198	621	870	-	-	-
Stage 1	452	-	-	-	-	-
Stage 2	627	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	189	613	864	-	-	-
Mov Cap-2 Maneuver	312	-	-	-	-	-
Stage 1	433	-	-	-	-	-
Stage 2	623	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.1	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	864	-	394	-	-
HCM Lane V/C Ratio	0.034	-	0.177	-	-
HCM Control Delay (s)	9.3	-	16.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	143	2	119	20	3	20	174	521	27	35	368	242
Future Volume (veh/h)	143	2	119	20	3	20	174	521	27	35	368	242
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.97	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	155	2	129	22	3	22	189	566	29	38	400	263
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	456	331	278	373	25	185	284	2199	112	54	804	522
Arrive On Green	0.11	0.18	0.18	0.06	0.13	0.13	0.08	0.44	0.44	0.03	0.39	0.39
Sat Flow, veh/h	1774	1863	1565	1774	193	1416	3442	4947	252	1774	2048	1331
Grp Volume(v), veh/h	155	2	129	22	0	25	189	387	208	38	345	318
Grp Sat Flow(s),veh/h/ln	1774	1863	1565	1774	0	1609	1721	1695	1809	1774	1770	1610
Q Serve(g_s), s	4.8	0.1	4.9	0.7	0.0	0.9	3.6	4.8	4.8	1.4	9.8	10.0
Cycle Q Clear(g_c), s	4.8	0.1	4.9	0.7	0.0	0.9	3.6	4.8	4.8	1.4	9.8	10.0
Prop In Lane	1.00		1.00	1.00		0.88	1.00		0.14	1.00		0.83
Lane Grp Cap(c), veh/h	456	331	278	373	0	210	284	1507	804	54	694	632
V/C Ratio(X)	0.34	0.01	0.46	0.06	0.00	0.12	0.67	0.26	0.26	0.71	0.50	0.50
Avail Cap(c_a), veh/h	697	1004	844	697	0	868	392	1507	804	173	694	632
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.8	22.6	24.6	22.2	0.0	25.6	29.7	11.6	11.6	32.1	15.3	15.4
Incr Delay (d2), s/veh	0.4	0.0	1.2	0.1	0.0	0.2	2.7	0.4	0.8	15.6	2.5	2.9
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	2.4	0.0	2.2	0.3	0.0	0.4	1.8	2.3	2.5	0.9	5.3	4.9
LnGrp Delay(d),s/veh	21.2	22.6	25.8	22.3	0.0	25.9	32.4	12.0	12.4	47.7	17.8	18.2
LnGrp LOS	C	C	C	C		C	C	B	B	D	B	B
Approach Vol, veh/h		286			47			784			701	
Approach Delay, s/veh		23.3			24.2			17.1			19.6	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	31.8	11.4	13.6	6.4	35.3	8.3	16.8
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	7.6	* 26	16.1	36.0	6.5	27.1	16.1	36.0
Max Q Clear Time (g_c+I1), s	5.6	12.0	6.8	2.9	3.4	6.8	2.7	6.9
Green Ext Time (p_c), s	0.1	3.3	0.2	0.1	0.0	3.3	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.2
HCM 2010 LOS	B

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	68	40	0	28	107	696	33	45	439	25
Future Volume (veh/h)	16	0	68	40	0	28	107	696	33	45	439	25
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	17	0	74	43	0	30	116	757	36	49	477	27
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	26	0	111	88	0	78	149	2527	120	65	2270	127
Arrive On Green	0.09	0.00	0.09	0.05	0.00	0.05	0.08	0.51	0.51	0.04	0.46	0.46
Sat Flow, veh/h	299	0	1302	1774	0	1576	1774	4967	235	1774	4918	276
Grp Volume(v), veh/h	91	0	0	43	0	30	116	516	277	49	327	177
Grp Sat Flow(s),veh/h/ln	1602	0	0	1774	0	1576	1774	1695	1812	1774	1695	1804
Q Serve(g_s), s	3.5	0.0	0.0	1.5	0.0	1.2	4.1	5.6	5.6	1.7	3.6	3.7
Cycle Q Clear(g_c), s	3.5	0.0	0.0	1.5	0.0	1.2	4.1	5.6	5.6	1.7	3.6	3.7
Prop In Lane	0.19		0.81	1.00		1.00	1.00		0.13	1.00		0.15
Lane Grp Cap(c), veh/h	137	0	0	88	0	78	149	1725	922	65	1565	833
V/C Ratio(X)	0.66	0.00	0.00	0.49	0.00	0.38	0.78	0.30	0.30	0.76	0.21	0.21
Avail Cap(c_a), veh/h	785	0	0	897	0	797	213	1725	922	250	1565	833
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	0.0	29.3	0.0	29.1	28.4	9.0	9.0	30.2	10.1	10.2
Incr Delay (d2), s/veh	5.4	0.0	0.0	4.1	0.0	3.0	11.1	0.4	0.8	16.3	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	0.8	0.0	0.6	2.4	2.7	3.0	1.1	1.7	1.9
LnGrp Delay(d),s/veh	33.5	0.0	0.0	33.4	0.0	32.1	39.5	9.4	9.8	46.5	10.5	10.7
LnGrp LOS	C			C		C	D	A	A	D	B	B
Approach Vol, veh/h		91			73			909			553	
Approach Delay, s/veh		33.5			32.9			13.4			13.7	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	35.2		8.1	6.7	38.2		10.3
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	7.6	29.2		32.0	8.9	27.9		31.0
Max Q Clear Time (g_c+I1), s	6.1	5.7		3.5	3.7	7.6		5.5
Green Ext Time (p_c), s	0.0	2.9		0.2	0.0	4.6		0.4

Intersection Summary			
HCM 2010 Ctrl Delay			15.5
HCM 2010 LOS			B

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	72	9	33	821	83	8	539
Future Volume (veh/h)	72	9	33	821	83	8	539
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.97	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	78	10		892	90	9	586
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.92	0.92		0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	109	97		2901	291	17	3670
Arrive On Green	0.06	0.06		0.62	0.62	0.01	0.72
Sat Flow, veh/h	1774	1583		4850	471	1774	5253
Grp Volume(v), veh/h	78	10		645	337	9	586
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1763	1774	1695
Q Serve(g_s), s	2.1	0.3		4.3	4.4	0.2	1.8
Cycle Q Clear(g_c), s	2.1	0.3		4.3	4.4	0.2	1.8
Prop In Lane	1.00	1.00			0.27	1.00	
Lane Grp Cap(c), veh/h	109	97		2100	1092	17	3670
V/C Ratio(X)	0.72	0.10		0.31	0.31	0.54	0.16
Avail Cap(c_a), veh/h	1135	1013		2100	1092	147	3670
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.3	21.5		4.3	4.3	23.9	2.1
Incr Delay (d2), s/veh	8.4	0.5		0.4	0.7	24.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.3		2.1	2.3	0.2	0.8
LnGrp Delay(d),s/veh	30.7	21.9		4.7	5.1	48.2	2.2
LnGrp LOS	C	C		A	A	D	A
Approach Vol, veh/h	88			982			595
Approach Delay, s/veh	29.7			4.8			2.9
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.0		7.5	5.0	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		30.0		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		3.8		4.1	2.2	6.4		
Green Ext Time (p_c), s		3.8		0.2	0.0	6.3		

Intersection Summary	
HCM 2010 Ctrl Delay	5.5
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	49	61	879	75	415	111	534	452	323	302	0
Future Volume (veh/h)	27	49	61	879	75	415	111	534	452	323	302	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	29	53	66	955	82	451	121	580	491	351	328	0
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	101	237	238	1037	580	482	148	1218	1015	413	1348	603
Arrive On Green	0.06	0.07	0.07	0.30	0.31	0.31	0.08	0.34	0.34	0.12	0.38	0.00
Sat Flow, veh/h	1774	3539	1583	3442	1863	1547	1774	3539	1562	3442	3539	1583
Grp Volume(v), veh/h	29	53	66	955	82	451	121	580	491	351	328	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1547	1774	1770	1562	1721	1770	1583
Q Serve(g_s), s	1.9	1.7	4.4	32.2	3.8	34.0	8.1	15.4	19.5	12.0	7.6	0.0
Cycle Q Clear(g_c), s	1.9	1.7	4.4	32.2	3.8	34.0	8.1	15.4	19.5	12.0	7.6	0.0
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	101	237	238	1037	580	482	148	1218	1015	413	1348	603
V/C Ratio(X)	0.29	0.22	0.28	0.92	0.14	0.94	0.82	0.48	0.48	0.85	0.24	0.00
Avail Cap(c_a), veh/h	163	454	335	1141	686	570	223	1218	1015	496	1348	603
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	0.97	0.97	0.97	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.3	53.0	45.2	40.5	29.7	40.1	54.1	30.9	11.0	51.7	25.3	0.0
Incr Delay (d2), s/veh	1.6	0.5	0.6	11.3	0.1	21.2	13.1	1.3	1.6	11.4	0.4	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	1.0	0.8	2.0	16.9	2.0	17.3	4.5	7.7	8.8	6.4	3.8	0.0
LnGrp Delay(d),s/veh	55.8	53.5	45.9	51.9	29.9	61.3	67.2	32.2	12.6	63.2	25.8	0.0
LnGrp LOS	E	D	D	D	C	E	E	C	B	E	C	
Approach Vol, veh/h		148			1488			1192			679	
Approach Delay, s/veh		50.5			53.5			27.7			45.1	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.1	46.4	41.4	13.1	14.7	50.8	12.0	42.5
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 17	27.4	* 40	15.4	* 15	29.6	* 11	44.2
Max Q Clear Time (g_c+I1), s	14.0	21.5	34.2	6.4	10.1	9.6	3.9	36.0
Green Ext Time (p_c), s	0.4	2.7	2.0	0.2	0.1	1.8	0.0	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	43.0
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	87	0	89	528	1012	0	0	409	753
Future Volume (veh/h)	0	0	0	87	0	89	528	1012	0	0	409	753
Number				3	8	18	5	2	12	1	6	16
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		0.90
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				95	0	97	574	1100	0	0	445	818
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
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	0	2	2
Cap, veh/h				138	0	123	604	4290	0	0	1582	662
Arrive On Green				0.08	0.00	0.08	0.34	0.84	0.00	0.00	0.47	0.47
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	3558	1418
Grp Volume(v), veh/h				95	0	97	574	1100	0	0	445	818
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1695	1418
Q Serve(g_s), s				6.8	0.0	7.8	41.0	5.6	0.0	0.0	10.5	60.7
Cycle Q Clear(g_c), s				6.8	0.0	7.8	41.0	5.6	0.0	0.0	10.5	60.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				138	0	123	604	4290	0	0	1582	662
V/C Ratio(X)				0.69	0.00	0.79	0.95	0.26	0.00	0.00	0.28	1.24
Avail Cap(c_a), veh/h				212	0	189	700	4290	0	0	1582	662
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.56	0.56	0.00	0.00	0.66	0.66
Uniform Delay (d), s/veh				58.4	0.0	58.9	41.8	2.0	0.0	0.0	21.3	34.7
Incr Delay (d2), s/veh				5.9	0.0	11.4	14.0	0.1	0.0	0.0	0.3	115.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.6	0.0	3.8	22.4	2.6	0.0	0.0	4.9	44.8
LnGrp Delay(d),s/veh				64.3	0.0	70.2	55.8	2.1	0.0	0.0	21.6	149.7
LnGrp LOS				E		E	E	A			C	F
Approach Vol, veh/h					192			1674			1263	
Approach Delay, s/veh					67.3			20.5			104.6	
Approach LOS					E			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		114.8			49.0	65.8		15.2
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		104.3			* 51	48.3		15.5
Max Q Clear Time (g_c+I1), s		7.6			43.0	62.7		9.8
Green Ext Time (p_c), s		9.2			1.3	0.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	57.3
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	644	4	486	0	0	0	0	894	98	106	402	0
Future Volume (veh/h)	644	4	486	0	0	0	0	894	98	106	402	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	616	122	528				0	972	107	115	437	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
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				0	2	2	2	2	0
Cap, veh/h	776	134	579				0	1468	161	144	1591	0
Arrive On Green	0.44	0.44	0.44				0.00	0.32	0.32	0.08	0.45	0.00
Sat Flow, veh/h	1774	306	1323				0	4812	510	1774	3632	0
Grp Volume(v), veh/h	616	0	650				0	709	370	115	437	0
Grp Sat Flow(s),veh/h/ln	1774	0	1629				0	1695	1764	1774	1770	0
Q Serve(g_s), s	26.9	0.0	33.6				0.0	16.3	16.3	5.7	7.0	0.0
Cycle Q Clear(g_c), s	26.9	0.0	33.6				0.0	16.3	16.3	5.7	7.0	0.0
Prop In Lane	1.00		0.81				0.00		0.29	1.00		0.00
Lane Grp Cap(c), veh/h	776	0	712				0	1072	558	144	1591	0
V/C Ratio(X)	0.79	0.00	0.91				0.00	0.66	0.66	0.80	0.27	0.00
Avail Cap(c_a), veh/h	846	0	777				0	1072	558	152	1591	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.65	0.65	0.00
Uniform Delay (d), s/veh	21.8	0.0	23.7				0.0	26.6	26.6	40.6	15.6	0.0
Incr Delay (d2), s/veh	4.9	0.0	14.4				0.0	3.2	6.1	17.0	0.3	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
%ile BackOfQ(50%),veh/ln	14.2	0.0	17.8				0.0	8.1	8.9	3.5	3.5	0.0
LnGrp Delay(d),s/veh	26.7	0.0	38.1				0.0	29.8	32.8	57.7	15.8	0.0
LnGrp LOS	C		D					C	C	E	B	
Approach Vol, veh/h		1266						1079			552	
Approach Delay, s/veh		32.6						30.8			24.6	
Approach LOS		C						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	12.0	33.6		44.4		45.6		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 7.7	24.5		42.9		36.9		
Max Q Clear Time (g_c+I1), s	7.7	18.3		35.6		9.0		
Green Ext Time (p_c), s	0.0	3.2		3.7		2.7		

Intersection Summary		
HCM 2010 Ctrl Delay		30.4
HCM 2010 LOS		C

Notes

Intersection	
Intersection Delay, s/veh	50.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	356	25	38	4	11	198	18	425	6	247	393	211
Future Vol, veh/h	356	25	38	4	11	198	18	425	6	247	393	211
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	387	27	41	4	12	215	20	462	7	268	427	229
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	38.2	34.3	56.7	57.9
HCM LOS	E	D	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	70%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	96%	0%	12%	0%	100%	0%	0%	100%	38%
Vol Right, %	0%	0%	4%	0%	18%	0%	0%	100%	0%	0%	62%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	18	283	148	210	209	4	11	198	247	262	342
LT Vol	18	0	0	210	146	4	0	0	247	0	0
Through Vol	0	283	142	0	25	0	11	0	0	262	131
RT Vol	0	0	6	0	38	0	0	198	0	0	211
Lane Flow Rate	20	308	161	228	227	4	12	215	268	285	372
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.064	0.964	0.501	0.726	0.705	0.015	0.04	0.685	0.794	0.801	1
Departure Headway (Hd)	11.784	11.266	11.236	11.445	11.167	12.702	12.186	11.462	10.648	10.13	9.682
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	307	326	324	317	325	286	297	319	341	356	375
Service Time	9.429	8.932	8.903	9.203	8.936	10.303	9.811	9.122	8.427	7.909	7.461
HCM Lane V/C Ratio	0.065	0.945	0.497	0.719	0.698	0.014	0.04	0.674	0.786	0.801	0.992
HCM Control Delay	15.2	76.1	24.6	39.5	36.8	15.5	15.3	35.7	44.4	43.5	78.7
HCM Lane LOS	C	F	C	E	E	C	C	E	E	E	F
HCM 95th-tile Q	0.2	10.1	2.7	5.3	5	0	0.1	4.7	6.6	6.8	11.8

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	681	109	0	1309	20	0	0	32	20	0	63
Future Vol, veh/h	17	681	109	0	1309	20	0	0	32	20	0	63
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	-	-	-	-	-	400	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	740	118	0	1423	22	0	0	35	22	0	68

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1445	0	0	-	-	0	-	-	429	1755	-	712
Stage 1	-	-	-	-	-	-	-	-	-	1423	-	-
Stage 2	-	-	-	-	-	-	-	-	-	332	-	-
Critical Hdwy	5.34	-	-	-	-	-	-	-	7.14	6.44	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	7.34	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	6.74	-	-
Follow-up Hdwy	3.12	-	-	-	-	-	-	-	3.92	3.82	-	3.92
Pot Cap-1 Maneuver	237	-	-	0	-	-	0	0	491	90	0	322
Stage 1	-	-	-	0	-	-	0	0	-	100	0	-
Stage 2	-	-	-	0	-	-	0	0	-	601	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	237	-	-	-	-	-	-	-	491	74	-	322
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	74	-	-
Stage 1	-	-	-	-	-	-	-	-	-	85	-	-
Stage 2	-	-	-	-	-	-	-	-	-	475	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0	12.9	19.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	491	237	-	-	-	-	322
HCM Lane V/C Ratio	0.071	0.078	-	-	-	-	0.213
HCM Control Delay (s)	12.9	21.5	-	-	-	-	19.2
HCM Lane LOS	B	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0.2	0.3	-	-	-	-	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	348	157	118	768	70	248	13	63	117	15	341
Future Volume (veh/h)	173	348	157	118	768	70	248	13	63	117	15	341
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	188	378	171	128	835	76	270	14	68	127	0	382
Adj No. of Lanes	2	3	1	1	3	1	2	1	0	1	0	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	260	1043	325	159	1141	355	348	31	150	690	0	1247
Arrive On Green	0.08	0.21	0.21	0.09	0.22	0.22	0.10	0.11	0.11	0.39	0.00	0.39
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	3442	277	1348	1774	0	3167
Grp Volume(v), veh/h	188	378	171	128	835	76	270	0	82	127	0	382
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1721	0	1625	1774	0	1583
Q Serve(g_s), s	5.3	6.3	9.5	7.0	15.1	3.9	7.6	0.0	4.7	4.7	0.0	8.2
Cycle Q Clear(g_c), s	5.3	6.3	9.5	7.0	15.1	3.9	7.6	0.0	4.7	4.7	0.0	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	260	1043	325	159	1141	355	348	0	181	690	0	1247
V/C Ratio(X)	0.72	0.36	0.53	0.80	0.73	0.21	0.78	0.00	0.45	0.18	0.00	0.31
Avail Cap(c_a), veh/h	417	1474	459	296	1746	544	539	0	263	690	0	1247
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.8	33.8	35.1	44.2	35.6	31.3	43.4	0.0	41.2	19.9	0.0	20.7
Incr Delay (d2), s/veh	3.8	0.2	1.3	9.0	0.9	0.3	3.8	0.0	1.8	0.6	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	3.0	4.3	3.8	7.1	1.7	3.8	0.0	2.2	2.4	0.0	3.7
LnGrp Delay(d),s/veh	48.6	34.0	36.4	53.2	36.5	31.6	47.2	0.0	43.0	20.5	0.0	21.3
LnGrp LOS	D	C	D	D	D	C	D		D	C		C
Approach Vol, veh/h		737			1039			352			509	
Approach Delay, s/veh		38.3			38.2			46.2			21.1	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	27.6	14.5	43.5	11.5	29.5	42.5	15.5
Change Period (Y+Rc), s	4.5	7.3	4.5	* 4.5	4.0	* 7.3	4.0	4.5
Max Green Setting (Gmax), s	16.5	28.7	15.5	* 39	12.0	* 34	38.5	16.0
Max Q Clear Time (g_c+I1), s	9.0	11.5	9.6	10.2	7.3	17.1	6.7	6.7
Green Ext Time (p_c), s	0.2	2.5	0.4	1.5	0.2	5.1	0.3	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	36.0
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	534	5	0	829	35	0	0	5	0	0	141
Future Vol, veh/h	0	534	5	0	829	35	0	0	5	0	0	141
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	580	5	0	901	38	0	0	5	0	0	153

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	293	-	-	451
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	600	0	0	475
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	600	-	-	475
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.1	16.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	600	-	-	-	-	475
HCM Lane V/C Ratio	0.009	-	-	-	-	0.323
HCM Control Delay (s)	11.1	-	-	-	-	16.1
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	-	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	287	99	29	424	155	165	34	53	219	57	278
Future Volume (veh/h)	153	287	99	29	424	155	165	34	53	219	57	278
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	166	312	108	32	461	168	179	37	58	238	62	302
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	246	1070	328	86	833	255	218	241	378	251	728	1087
Arrive On Green	0.07	0.21	0.21	0.02	0.16	0.16	0.12	0.37	0.37	0.14	0.39	0.39
Sat Flow, veh/h	3442	5085	1558	3442	5085	1557	1774	650	1018	1774	1863	2782
Grp Volume(v), veh/h	166	312	108	32	461	168	179	0	95	238	62	302
Grp Sat Flow(s),veh/h/ln	1721	1695	1558	1721	1695	1557	1774	0	1668	1774	1863	1391
Q Serve(g_s), s	4.0	4.4	5.0	0.8	7.1	8.6	8.3	0.0	3.2	11.3	1.8	6.3
Cycle Q Clear(g_c), s	4.0	4.4	5.0	0.8	7.1	8.6	8.3	0.0	3.2	11.3	1.8	6.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.61	1.00		1.00
Lane Grp Cap(c), veh/h	246	1070	328	86	833	255	218	0	620	251	728	1087
V/C Ratio(X)	0.67	0.29	0.33	0.37	0.55	0.66	0.82	0.00	0.15	0.95	0.09	0.28
Avail Cap(c_a), veh/h	455	2460	754	183	2058	630	335	0	620	251	728	1087
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	28.1	28.4	40.7	32.6	33.2	36.3	0.0	17.7	36.1	16.3	17.7
Incr Delay (d2), s/veh	3.2	0.1	0.6	2.7	0.6	2.9	9.3	0.0	0.5	42.4	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.1	2.2	0.4	3.3	3.9	4.6	0.0	1.6	8.4	1.0	2.5
LnGrp Delay(d),s/veh	41.6	28.3	29.0	43.3	33.2	36.1	45.5	0.0	18.3	78.5	16.5	18.3
LnGrp LOS	D	C	C	D	C	D	D		B	E	B	B
Approach Vol, veh/h		586			661			274			602	
Approach Delay, s/veh		32.2			34.4			36.1			41.9	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	40.5	10.1	19.8	16.0	38.9	6.1	23.7
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	16.0	27.2	11.2	34.3	12.0	* 32	4.5	41.0
Max Q Clear Time (g_c+I1), s	10.3	8.3	6.0	10.6	13.3	5.2	2.8	7.0
Green Ext Time (p_c), s	0.2	1.4	0.2	3.3	0.0	0.4	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	36.1
HCM 2010 LOS	D

Notes

Appendix S

Near Term Year 2020 with Project Level of Service Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	4	14	90	7	53	22	681	59	42	597	22
Future Volume (veh/h)	60	4	14	90	7	53	22	681	59	42	597	22
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.98	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	65	4	15	98	8	58	24	740	64	46	649	24
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	126	8	29	135	11	80	39	1268	110	64	1389	51
Arrive On Green	0.09	0.09	0.09	0.13	0.13	0.13	0.02	0.39	0.39	0.04	0.40	0.40
Sat Flow, veh/h	1346	83	311	1018	83	603	1774	3290	284	1774	3477	128
Grp Volume(v), veh/h	84	0	0	164	0	0	24	398	406	46	330	343
Grp Sat Flow(s),veh/h/ln	1740	0	0	1704	0	0	1774	1770	1805	1774	1770	1835
Q Serve(g_s), s	2.6	0.0	0.0	5.2	0.0	0.0	0.8	10.1	10.1	1.5	7.8	7.8
Cycle Q Clear(g_c), s	2.6	0.0	0.0	5.2	0.0	0.0	0.8	10.1	10.1	1.5	7.8	7.8
Prop In Lane	0.77		0.18	0.60		0.35	1.00		0.16	1.00		0.07
Lane Grp Cap(c), veh/h	163	0	0	226	0	0	39	682	695	64	707	733
V/C Ratio(X)	0.52	0.00	0.00	0.72	0.00	0.00	0.61	0.58	0.58	0.71	0.47	0.47
Avail Cap(c_a), veh/h	826	0	0	809	0	0	131	682	695	128	707	733
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	0.0	0.0	23.6	0.0	0.0	27.5	13.9	13.9	27.1	12.6	12.6
Incr Delay (d2), s/veh	2.5	0.0	0.0	4.4	0.0	0.0	14.3	3.6	3.6	13.6	2.2	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.0	2.7	0.0	0.0	0.5	5.5	5.7	0.9	4.2	4.3
LnGrp Delay(d),s/veh	27.1	0.0	0.0	28.0	0.0	0.0	41.8	17.5	17.4	40.7	14.8	14.7
LnGrp LOS	C			C			D	B	B	D	B	B
Approach Vol, veh/h		84			164			828			719	
Approach Delay, s/veh		27.1			28.0			18.2			16.4	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	28.5		12.5	6.5	27.7		10.2
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	4.2	* 22		27.0	4.1	21.9		27.0
Max Q Clear Time (g_c+I1), s	2.8	9.8		7.2	3.5	12.1		4.6
Green Ext Time (p_c), s	0.0	3.0		0.7	0.0	3.2		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	18.8
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	82	32	16	710	580	90
Future Vol, veh/h	82	32	16	710	580	90
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	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	89	35	17	772	630	98

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1115	380	736	0	-	0
Stage 1	687	-	-	-	-	-
Stage 2	428	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	202	618	865	-	-	-
Stage 1	461	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	195	610	859	-	-	-
Mov Cap-2 Maneuver	321	-	-	-	-	-
Stage 1	449	-	-	-	-	-
Stage 2	621	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.6	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	859	-	370	-	-
HCM Lane V/C Ratio	0.02	-	0.335	-	-
HCM Control Delay (s)	9.3	-	19.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	390	22	411	23	36	33	366	297	35	18	285	302
Future Volume (veh/h)	390	22	411	23	36	33	366	297	35	18	285	302
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.97		0.98	1.00		0.97	1.00		0.98
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	424	24	447	25	39	36	398	323	38	20	310	328
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	623	641	521	302	157	145	480	1871	215	30	501	439
Arrive On Green	0.21	0.34	0.34	0.04	0.18	0.18	0.14	0.41	0.41	0.02	0.28	0.28
Sat Flow, veh/h	1774	1863	1515	1774	885	817	3442	4614	529	1774	1770	1552
Grp Volume(v), veh/h	424	24	447	25	0	75	398	235	126	20	310	328
Grp Sat Flow(s),veh/h/ln	1774	1863	1515	1774	0	1702	1721	1695	1753	1774	1770	1552
Q Serve(g_s), s	18.7	0.9	27.4	1.1	0.0	3.8	11.2	4.4	4.6	1.1	15.2	19.2
Cycle Q Clear(g_c), s	18.7	0.9	27.4	1.1	0.0	3.8	11.2	4.4	4.6	1.1	15.2	19.2
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	623	641	521	302	0	303	480	1375	711	30	501	439
V/C Ratio(X)	0.68	0.04	0.86	0.08	0.00	0.25	0.83	0.17	0.18	0.66	0.62	0.75
Avail Cap(c_a), veh/h	623	718	584	517	0	579	641	1375	711	99	501	439
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	21.8	30.5	31.0	0.0	35.3	41.8	19.0	19.0	48.8	31.1	32.5
Incr Delay (d2), s/veh	3.0	0.0	11.2	0.1	0.0	0.4	6.8	0.3	0.5	21.9	5.6	11.0
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	9.6	0.4	13.0	0.6	0.0	1.8	5.8	2.1	2.3	0.7	8.2	9.5
LnGrp Delay(d),s/veh	26.6	21.8	41.6	31.1	0.0	35.7	48.6	19.2	19.6	70.7	36.8	43.6
LnGrp LOS	C	C	D	C		D	D	B	B	E	D	D
Approach Vol, veh/h		895			100			759			658	
Approach Delay, s/veh		34.0			34.6			34.7			41.2	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.3	33.9	25.0	22.7	6.1	46.1	8.4	39.3
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	18.6	* 28	20.6	34.0	5.6	40.5	16.1	38.5
Max Q Clear Time (g_c+I1), s	13.2	21.2	20.7	5.8	3.1	6.6	3.1	29.4
Green Ext Time (p_c), s	0.7	2.0	0.0	0.3	0.0	2.1	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	36.2
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	96	36	0	42	44	618	24	26	682	11
Future Volume (veh/h)	27	0	96	36	0	42	44	618	24	26	682	11
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.96	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	29	0	104	39	0	46	48	672	26	28	741	12
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	43	0	154	89	0	79	63	2468	95	43	2476	40
Arrive On Green	0.12	0.00	0.12	0.05	0.00	0.05	0.04	0.49	0.49	0.02	0.48	0.48
Sat Flow, veh/h	351	0	1258	1774	0	1583	1774	5016	193	1774	5150	83
Grp Volume(v), veh/h	133	0	0	39	0	46	48	453	245	28	487	266
Grp Sat Flow(s),veh/h/ln	1609	0	0	1774	0	1583	1774	1695	1819	1774	1695	1843
Q Serve(g_s), s	5.1	0.0	0.0	1.4	0.0	1.8	1.7	5.1	5.1	1.0	5.7	5.7
Cycle Q Clear(g_c), s	5.1	0.0	0.0	1.4	0.0	1.8	1.7	5.1	5.1	1.0	5.7	5.7
Prop In Lane	0.22		0.78	1.00		1.00	1.00		0.11	1.00		0.05
Lane Grp Cap(c), veh/h	197	0	0	89	0	79	63	1668	895	43	1630	886
V/C Ratio(X)	0.68	0.00	0.00	0.44	0.00	0.58	0.76	0.27	0.27	0.65	0.30	0.30
Avail Cap(c_a), veh/h	768	0	0	875	0	781	153	1668	895	169	1630	886
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	0.0	0.0	29.9	0.0	30.2	31.0	9.7	9.7	31.4	10.2	10.2
Incr Delay (d2), s/veh	4.0	0.0	0.0	3.4	0.0	6.6	16.7	0.4	0.8	15.0	0.5	0.9
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	2.5	0.0	0.0	0.8	0.0	0.9	1.1	2.4	2.7	0.7	2.7	3.1
LnGrp Delay(d),s/veh	31.3	0.0	0.0	33.3	0.0	36.7	47.7	10.1	10.4	46.4	10.7	11.1
LnGrp LOS	C			C		D	D	B	B	D	B	B
Approach Vol, veh/h		133			85			746			781	
Approach Delay, s/veh		31.3			35.2			12.6			12.1	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	37.2		8.1	6.0	37.9		12.8
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	5.6	31.2		32.0	6.2	30.6		31.0
Max Q Clear Time (g_c+I1), s	3.7	7.7		3.8	3.0	7.1		7.1
Green Ext Time (p_c), s	0.0	4.5		0.3	0.0	4.1		0.7

Intersection Summary		
HCM 2010 Ctrl Delay		14.9
HCM 2010 LOS		B

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	84	9	54	704	40	5	757
Future Volume (veh/h)	84	9	54	704	40	5	757
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.96	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	91	10		765	43	5	823
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.92	0.92		0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	127	113		3025	169	10	3626
Arrive On Green	0.07	0.07		0.62	0.62	0.01	0.71
Sat Flow, veh/h	1774	1583		5084	275	1774	5253
Grp Volume(v), veh/h	91	10		526	282	5	823
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1801	1774	1695
Q Serve(g_s), s	2.4	0.3		3.4	3.5	0.1	2.7
Cycle Q Clear(g_c), s	2.4	0.3		3.4	3.5	0.1	2.7
Prop In Lane	1.00	1.00			0.15	1.00	
Lane Grp Cap(c), veh/h	127	113		2086	1108	10	3626
V/C Ratio(X)	0.72	0.09		0.25	0.25	0.52	0.23
Avail Cap(c_a), veh/h	1128	1007		2086	1108	146	3626
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.1	21.1		4.3	4.3	24.2	2.4
Incr Delay (d2), s/veh	7.3	0.3		0.3	0.6	38.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.3		1.7	1.9	0.2	1.3
LnGrp Delay(d),s/veh	29.5	21.5		4.6	4.8	62.4	2.5
LnGrp LOS	C	C		A	A	E	A
Approach Vol, veh/h	101			808			828
Approach Delay, s/veh	28.7			4.7			2.9
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		40.8		8.0	4.8	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		30.0		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		4.7		4.4	2.1	5.5		
Green Ext Time (p_c), s		5.5		0.2	0.0	5.0		

Intersection Summary	
HCM 2010 Ctrl Delay	5.2
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	54	65	399	62	261	83	382	770	405	565	1
Future Volume (veh/h)	28	54	65	399	62	261	83	382	770	405	565	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	30	59	71	434	67	284	90	415	837	440	614	1
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	114	418	290	531	387	322	115	1297	817	474	1556	670
Arrive On Green	0.06	0.12	0.12	0.15	0.21	0.21	0.06	0.37	0.37	0.14	0.44	0.44
Sat Flow, veh/h	1774	3539	1583	3442	1863	1547	1774	3539	1563	3442	3539	1524
Grp Volume(v), veh/h	30	59	71	434	67	284	90	415	837	440	614	1
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1547	1774	1770	1563	1721	1770	1524
Q Serve(g_s), s	1.4	1.3	3.5	11.0	2.7	16.0	4.5	7.6	33.0	11.4	10.6	0.0
Cycle Q Clear(g_c), s	1.4	1.3	3.5	11.0	2.7	16.0	4.5	7.6	33.0	11.4	10.6	0.0
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	114	418	290	531	387	322	115	1297	817	474	1556	670
V/C Ratio(X)	0.26	0.14	0.25	0.82	0.17	0.88	0.78	0.32	1.02	0.93	0.39	0.00
Avail Cap(c_a), veh/h	217	606	373	757	501	416	142	1297	817	474	1556	670
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	0.97	0.97	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	35.6	31.5	36.8	29.3	34.6	41.5	20.5	21.6	38.4	17.1	14.1
Incr Delay (d2), s/veh	1.2	0.2	0.4	4.8	0.2	16.2	19.6	0.6	37.3	24.6	0.8	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	0.7	0.7	1.5	5.6	1.4	8.3	2.8	3.8	28.5	7.0	5.3	0.0
LnGrp Delay(d),s/veh	41.3	35.7	31.9	41.6	29.5	50.8	61.1	21.1	59.0	63.0	17.9	14.2
LnGrp LOS	D	D	C	D	C	D	E	C	F	E	B	B
Approach Vol, veh/h		160			785			1342			1055	
Approach Delay, s/veh		35.1			43.9			47.4			36.7	
Approach LOS		D			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.1	38.1	19.1	15.7	10.5	44.7	11.0	23.8				
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1				
Max Green Setting (Gmax), s	* 13	22.3	* 20	15.4	* 7.2	27.5	* 11	24.2				
Max Q Clear Time (g_c+I1), s	13.4	35.0	13.0	5.5	6.5	12.6	3.4	18.0				
Green Ext Time (p_c), s	0.0	0.0	0.9	0.3	0.0	3.3	0.0	0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			42.6									
HCM 2010 LOS			D									
Notes												

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	33	0	70	441	1071	0	0	373	566
Future Volume (veh/h)	0	0	0	33	0	70	441	1071	0	0	373	566
Number				3	8	18	5	2	12	1	6	16
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		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				36	0	76	479	1164	0	0	405	615
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
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	0	2	2
Cap, veh/h				121	0	108	508	4089	0	0	1556	698
Arrive On Green				0.07	0.00	0.07	0.57	1.00	0.00	0.00	0.46	0.46
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	3558	1520
Grp Volume(v), veh/h				36	0	76	479	1164	0	0	405	615
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1695	1520
Q Serve(g_s), s				1.5	0.0	3.8	20.1	0.0	0.0	0.0	5.9	29.4
Cycle Q Clear(g_c), s				1.5	0.0	3.8	20.1	0.0	0.0	0.0	5.9	29.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				121	0	108	508	4089	0	0	1556	698
V/C Ratio(X)				0.30	0.00	0.70	0.94	0.28	0.00	0.00	0.26	0.88
Avail Cap(c_a), veh/h				342	0	305	628	4089	0	0	1556	698
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	0.00	1.00	0.54	0.54	0.00	0.00	0.87	0.87
Uniform Delay (d), s/veh				35.4	0.0	36.5	16.5	0.0	0.0	0.0	13.3	19.7
Incr Delay (d2), s/veh				1.3	0.0	8.0	13.1	0.1	0.0	0.0	0.4	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				0.8	0.0	1.9	11.2	0.0	0.0	0.0	2.8	14.9
LnGrp Delay(d),s/veh				36.8	0.0	44.4	29.5	0.1	0.0	0.0	13.7	33.1
LnGrp LOS				D		D	C	A			B	C
Approach Vol, veh/h					112			1643			1020	
Approach Delay, s/veh					42.0			8.7			25.4	
Approach LOS					D			A			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		69.4			27.6	41.8		10.6
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		54.4			* 28	21.4		15.4
Max Q Clear Time (g_c+I1), s		2.0			22.1	31.4		5.8
Green Ext Time (p_c), s		9.8			0.9	0.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Notes

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	667	1	528	0	0	0	0	857	110	111	382	0
Future Volume (veh/h)	667	1	528	0	0	0	0	857	110	111	382	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	650	106	574				0	932	120	121	415	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
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				0	2	2	2	2	0
Cap, veh/h	752	107	580				0	1383	177	153	1588	0
Arrive On Green	0.42	0.42	0.42				0.00	0.30	0.30	0.03	0.15	0.00
Sat Flow, veh/h	1774	253	1369				0	4724	585	1774	3632	0
Grp Volume(v), veh/h	650	0	680				0	693	359	121	415	0
Grp Sat Flow(s),veh/h/ln	1774	0	1621				0	1695	1751	1774	1770	0
Q Serve(g_s), s	26.7	0.0	33.3				0.0	14.3	14.4	5.4	8.3	0.0
Cycle Q Clear(g_c), s	26.7	0.0	33.3				0.0	14.3	14.4	5.4	8.3	0.0
Prop In Lane	1.00		0.84				0.00		0.33	1.00		0.00
Lane Grp Cap(c), veh/h	752	0	687				0	1029	531	153	1588	0
V/C Ratio(X)	0.86	0.00	0.99				0.00	0.67	0.68	0.79	0.26	0.00
Avail Cap(c_a), veh/h	752	0	687				0	1029	531	162	1588	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.87	0.87	0.00
Uniform Delay (d), s/veh	21.0	0.0	22.9				0.0	24.4	24.4	38.1	22.3	0.0
Incr Delay (d2), s/veh	10.3	0.0	31.7				0.0	3.5	6.8	19.1	0.3	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
%ile BackOfQ(50%),veh/ln	15.2	0.0	20.8				0.0	7.1	7.9	3.5	4.2	0.0
LnGrp Delay(d),s/veh	31.3	0.0	54.6				0.0	27.9	31.2	57.3	22.7	0.0
LnGrp LOS	C		D					C	C	E	C	
Approach Vol, veh/h		1330						1052			536	
Approach Delay, s/veh		43.2						29.0			30.5	
Approach LOS		D						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	11.6	29.4		39.0		41.0		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 7.3	23.9		33.9		35.9		
Max Q Clear Time (g_c+I1), s	7.4	16.4		35.3		10.3		
Green Ext Time (p_c), s	0.0	3.7		0.0		2.5		

Intersection Summary		
HCM 2010 Ctrl Delay		35.7
HCM 2010 LOS		D

Notes

Intersection	
Intersection Delay, s/veh	107.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	386	6	15	0	22	211	34	415	0	92	349	454
Future Vol, veh/h	386	6	15	0	22	211	34	415	0	92	349	454
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	420	7	16	0	24	229	37	451	0	100	379	493
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	33.6	30.9	26.9	201.9
HCM LOS	D	D	D	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	90%	0%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	100%	0%	3%	100%	100%	0%	0%	100%	20%
Vol Right, %	0%	0%	0%	0%	7%	0%	0%	100%	0%	0%	80%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	34	208	208	205	202	0	22	211	92	233	570
LT Vol	34	0	0	205	181	0	0	0	92	0	0
Through Vol	0	208	208	0	6	0	22	0	0	233	116
RT Vol	0	0	0	0	15	0	0	211	0	0	454
Lane Flow Rate	37	226	226	222	220	0	24	229	100	253	620
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.112	0.651	0.541	0.661	0.648	0	0.073	0.653	0.287	0.69	1.591
Departure Headway (Hd)	11.82	11.293	9.466	11.565	11.458	11.847	11.847	11.125	10.344	9.821	9.238
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	305	323	383	314	317	0	304	328	347	367	397
Service Time	9.52	8.993	7.166	9.265	9.158	9.547	9.547	8.825	8.11	7.586	7.003
HCM Lane V/C Ratio	0.121	0.7	0.59	0.707	0.694	0	0.079	0.698	0.288	0.689	1.562
HCM Control Delay	16	32.8	22.8	34.2	33	14.5	15.5	32.5	17.2	31.9	301
HCM Lane LOS	C	D	C	D	D	N	C	D	C	D	F
HCM 95th-tile Q	0.4	4.3	3.1	4.4	4.2	0	0.2	4.3	1.2	4.9	35.2

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1123	106	0	0	0	92
Future Vol, veh/h	1123	106	0	0	0	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	-	-	-	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	1221	115	0	0	0	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	611
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	374
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	374
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	374	-	-	-
HCM Lane V/C Ratio	0.267	-	-	-
HCM Control Delay (s)	18.1	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	1.1	-	-	-

Intersection	
Int Delay, s/veh	59.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	93	1040	82	55	421	1	137	7	53	35	6	91
Future Vol, veh/h	93	1040	82	55	421	1	137	7	53	35	6	91
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	250	-	250	250	-	400	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	101	1130	89	60	458	1	149	8	58	38	7	99

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	459	0	0	1219	0	0	1639	1911	565	1236	1999	229
Stage 1	-	-	-	-	-	-	1332	1332	-	578	578	-
Stage 2	-	-	-	-	-	-	307	579	-	658	1421	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	708	-	-	306	-	-	~ 106	67	401	185	59	659
Stage 1	-	-	-	-	-	-	~ 116	222	-	388	499	-
Stage 2	-	-	-	-	-	-	621	499	-	382	201	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	708	-	-	306	-	-	~ 61	46	401	106	41	659
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 61	46	-	106	41	-
Stage 1	-	-	-	-	-	-	~ 99	190	-	333	401	-
Stage 2	-	-	-	-	-	-	417	401	-	269	172	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	2.3	$ 565.7	50
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	61	211	708	-	-	306	-	-	215
HCM Lane V/C Ratio	2.441	0.309	0.143	-	-	0.195	-	-	0.667
HCM Control Delay (s)	$ 800.6	29.5	10.9	-	-	19.6	-	-	50
HCM Lane LOS	F	D	B	-	-	C	-	-	F
HCM 95th %tile Q(veh)	14.8	1.3	0.5	-	-	0.7	-	-	4.1

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)	368	541	116	57	286	38	113	10	48	28	11	96
Future Volume (veh/h)	368	541	116	57	286	38	113	10	48	28	11	96
Number	5	2	12	1	6	16	3	8	18	7	4	14
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		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	400	588	126	62	311	41	123	11	52	30	0	112
Adj No. of Lanes	2	3	1	1	3	1	2	1	0	1	0	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	471	993	309	80	554	172	189	39	184	723	0	1515
Arrive On Green	0.14	0.20	0.20	0.05	0.11	0.11	0.05	0.14	0.14	0.41	0.00	0.48
Sat Flow, veh/h	3442	5085	1583	1774	5085	1579	3442	284	1342	1774	0	3127
Grp Volume(v), veh/h	400	588	126	62	311	41	123	0	63	30	0	112
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1579	1721	0	1626	1774	0	1564
Q Serve(g_s), s	10.7	9.9	6.6	3.3	5.5	2.2	3.3	0.0	3.3	1.0	0.0	1.8
Cycle Q Clear(g_c), s	10.7	9.9	6.6	3.3	5.5	2.2	3.3	0.0	3.3	1.0	0.0	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	471	993	309	80	554	172	189	0	223	723	0	1515
V/C Ratio(X)	0.85	0.59	0.41	0.78	0.56	0.24	0.65	0.00	0.28	0.04	0.00	0.07
Avail Cap(c_a), veh/h	510	1910	595	182	1722	535	317	0	275	723	0	1515
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.8	34.6	33.2	44.7	40.0	38.5	43.8	0.0	36.6	16.9	0.0	13.0
Incr Delay (d2), s/veh	12.1	0.6	0.9	14.6	0.9	0.7	3.7	0.0	0.7	0.1	0.0	0.1
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	5.9	4.7	2.9	1.9	2.6	1.0	1.7	0.0	1.5	0.5	0.0	0.8
LnGrp Delay(d),s/veh	51.9	35.2	34.1	59.3	40.9	39.2	47.5	0.0	37.3	17.0	0.0	13.1
LnGrp LOS	D	D	C	E	D	D	D		D	B		B
Approach Vol, veh/h		1114			414			186			142	
Approach Delay, s/veh		41.1			43.5			44.0			13.9	
Approach LOS		D			D			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	25.8	9.7	50.3	16.9	17.6	42.5	17.5
Change Period (Y+Rc), s	4.5	7.3	4.5	* 4.5	4.0	* 7.3	4.0	4.5
Max Green Setting (Gmax), s	9.7	35.5	8.7	* 46	14.0	* 32	38.5	16.0
Max Q Clear Time (g_c+I1), s	5.3	11.9	5.3	3.8	12.7	7.5	3.0	5.3
Green Ext Time (p_c), s	0.0	4.0	0.1	0.4	0.2	2.0	0.1	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	39.8
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	699	3	0	439	59	0	0	5	0	0	50
Future Vol, veh/h	0	699	3	0	439	59	0	0	5	0	0	50
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	760	3	0	477	64	0	0	5	0	0	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	382	-	-	239
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	526	0	0	649
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	526	-	-	649
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.9	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	526	-	-	-	-	649
HCM Lane V/C Ratio	0.01	-	-	-	-	0.084
HCM Control Delay (s)	11.9	-	-	-	-	11.1
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	178	298	142	42	239	116	82	34	48	89	24	100
Future Volume (veh/h)	178	298	142	42	239	116	82	34	48	89	24	100
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	193	324	154	46	260	126	89	37	52	97	26	109
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	289	911	280	114	652	203	115	298	419	124	807	1208
Arrive On Green	0.08	0.18	0.18	0.03	0.13	0.13	0.06	0.43	0.43	0.07	0.43	0.43
Sat Flow, veh/h	3442	5085	1565	3442	5085	1583	1774	696	978	1774	1863	2787
Grp Volume(v), veh/h	193	324	154	46	260	126	89	0	89	97	26	109
Grp Sat Flow(s),veh/h/ln	1721	1695	1565	1721	1695	1583	1774	0	1674	1774	1863	1393
Q Serve(g_s), s	4.0	4.1	6.6	1.0	3.5	5.5	3.6	0.0	2.4	4.0	0.6	1.7
Cycle Q Clear(g_c), s	4.0	4.1	6.6	1.0	3.5	5.5	3.6	0.0	2.4	4.0	0.6	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.58	1.00		1.00
Lane Grp Cap(c), veh/h	289	911	280	114	652	203	115	0	717	124	807	1208
V/C Ratio(X)	0.67	0.36	0.55	0.40	0.40	0.62	0.77	0.00	0.12	0.78	0.03	0.09
Avail Cap(c_a), veh/h	594	2834	872	211	2267	706	234	0	717	169	807	1208
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	26.5	27.5	34.9	29.5	30.4	33.9	0.0	12.7	33.6	12.0	12.3
Incr Delay (d2), s/veh	2.6	0.2	1.7	2.3	0.4	3.1	10.5	0.0	0.4	14.9	0.1	0.1
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	2.0	1.9	3.0	0.5	1.6	2.6	2.1	0.0	1.2	2.5	0.3	0.7
LnGrp Delay(d),s/veh	35.3	26.7	29.2	37.1	29.9	33.5	44.4	0.0	13.1	48.6	12.0	12.4
LnGrp LOS	D	C	C	D	C	C	D		B	D	B	B
Approach Vol, veh/h		671			432			178			232	
Approach Delay, s/veh		29.8			31.7			28.7			27.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	39.3	10.2	15.3	9.2	38.9	6.4	19.1
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	9.7	28.5	12.7	32.8	7.0	* 32	4.5	41.0
Max Q Clear Time (g_c+I1), s	5.6	3.7	6.0	7.5	6.0	4.4	3.0	8.6
Green Ext Time (p_c), s	0.1	0.5	0.3	1.9	0.0	0.4	0.0	2.5

Intersection Summary	
HCM 2010 Ctrl Delay	29.8
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	1	26	55	0	53	22	655	58	147	621	20
Future Volume (veh/h)	14	1	26	55	0	53	22	655	58	147	621	20
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	15	1	28	60	0	58	24	712	63	160	675	22
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	33	2	61	80	0	78	38	1442	128	201	1856	60
Arrive On Green	0.06	0.06	0.06	0.09	0.00	0.09	0.02	0.44	0.44	0.11	0.53	0.53
Sat Flow, veh/h	562	37	1050	852	0	823	1774	3289	291	1774	3497	114
Grp Volume(v), veh/h	44	0	0	118	0	0	24	383	392	160	341	356
Grp Sat Flow(s),veh/h/ln	1649	0	0	1675	0	0	1774	1770	1810	1774	1770	1842
Q Serve(g_s), s	1.7	0.0	0.0	4.6	0.0	0.0	0.9	10.5	10.5	5.9	7.6	7.6
Cycle Q Clear(g_c), s	1.7	0.0	0.0	4.6	0.0	0.0	0.9	10.5	10.5	5.9	7.6	7.6
Prop In Lane	0.34		0.64	0.51		0.49	1.00		0.16	1.00		0.06
Lane Grp Cap(c), veh/h	96	0	0	158	0	0	38	776	794	201	939	977
V/C Ratio(X)	0.46	0.00	0.00	0.75	0.00	0.00	0.63	0.49	0.49	0.79	0.36	0.36
Avail Cap(c_a), veh/h	661	0	0	671	0	0	136	776	794	315	939	977
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	0.0	0.0	29.9	0.0	0.0	32.8	13.6	13.6	29.2	9.2	9.2
Incr Delay (d2), s/veh	3.4	0.0	0.0	6.9	0.0	0.0	15.9	2.2	2.2	7.3	1.1	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	0.9	0.0	0.0	2.4	0.0	0.0	0.6	5.6	5.7	3.3	4.0	4.1
LnGrp Delay(d),s/veh	34.2	0.0	0.0	36.8	0.0	0.0	48.7	15.9	15.8	36.6	10.3	10.3
LnGrp LOS	C			D			D	B	B	D	B	B
Approach Vol, veh/h		44			118			799			857	
Approach Delay, s/veh		34.2			36.8			16.8			15.2	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	41.7		11.3	12.1	35.5		8.8
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	5.2	* 36		27.1	12.0	28.8		27.1
Max Q Clear Time (g_c+I1), s	2.9	9.6		6.6	7.9	12.5		3.7
Green Ext Time (p_c), s	0.0	4.0		0.5	0.1	4.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.8
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	30	29	698	661	50
Future Vol, veh/h	37	30	29	698	661	50
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	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	40	33	32	759	718	54

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1205	402	780	0	-	0
Stage 1	753	-	-	-	-	-
Stage 2	452	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	176	598	833	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	608	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	167	590	827	-	-	-
Mov Cap-2 Maneuver	290	-	-	-	-	-
Stage 1	406	-	-	-	-	-
Stage 2	604	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	827	-	375	-	-
HCM Lane V/C Ratio	0.038	-	0.194	-	-
HCM Control Delay (s)	9.5	-	16.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	143	2	152	31	3	20	200	560	36	35	417	242
Future Volume (veh/h)	143	2	152	31	3	20	200	560	36	35	417	242
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.97	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	155	2	165	34	3	22	217	609	39	38	453	263
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	455	332	279	367	25	186	312	2184	139	54	835	481
Arrive On Green	0.10	0.18	0.18	0.06	0.13	0.13	0.09	0.45	0.45	0.03	0.39	0.39
Sat Flow, veh/h	1774	1863	1565	1774	193	1416	3442	4876	310	1774	2154	1242
Grp Volume(v), veh/h	155	2	165	34	0	25	217	422	226	38	372	344
Grp Sat Flow(s),veh/h/ln	1774	1863	1565	1774	0	1609	1721	1695	1796	1774	1770	1626
Q Serve(g_s), s	4.9	0.1	6.5	1.1	0.0	0.9	4.1	5.3	5.4	1.4	11.0	11.1
Cycle Q Clear(g_c), s	4.9	0.1	6.5	1.1	0.0	0.9	4.1	5.3	5.4	1.4	11.0	11.1
Prop In Lane	1.00		1.00	1.00		0.88	1.00		0.17	1.00		0.76
Lane Grp Cap(c), veh/h	455	332	279	367	0	212	312	1518	804	54	686	630
V/C Ratio(X)	0.34	0.01	0.59	0.09	0.00	0.12	0.70	0.28	0.28	0.71	0.54	0.55
Avail Cap(c_a), veh/h	691	991	833	686	0	856	387	1518	804	170	686	630
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	22.8	25.5	22.6	0.0	25.9	29.8	11.8	11.8	32.5	16.1	16.1
Incr Delay (d2), s/veh	0.4	0.0	2.0	0.1	0.0	0.2	4.0	0.5	0.9	15.8	3.1	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	3.0	0.5	0.0	0.4	2.1	2.6	2.8	0.9	5.9	5.6
LnGrp Delay(d),s/veh	21.4	22.9	27.5	22.7	0.0	26.2	33.8	12.2	12.7	48.3	19.1	19.5
LnGrp LOS	C	C	C	C		C	C	B	B	D	B	B
Approach Vol, veh/h		322			59			865			754	
Approach Delay, s/veh		24.5			24.2			17.8			20.8	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	31.8	11.5	13.8	6.4	35.9	8.3	17.0
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	7.6	* 26	16.1	36.0	6.5	27.1	16.1	36.0
Max Q Clear Time (g_c+I1), s	6.1	13.1	6.9	2.9	3.4	7.4	3.1	8.5
Green Ext Time (p_c), s	0.1	3.4	0.2	0.1	0.0	3.6	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	20.2
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	68	51	0	28	107	769	42	45	531	25
Future Volume (veh/h)	16	0	68	51	0	28	107	769	42	45	531	25
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	17	0	74	55	0	30	116	836	46	49	577	27
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	26	0	111	97	0	86	148	2517	138	64	2306	107
Arrive On Green	0.09	0.00	0.09	0.05	0.00	0.05	0.08	0.51	0.51	0.04	0.46	0.46
Sat Flow, veh/h	299	0	1302	1774	0	1576	1774	4924	270	1774	4972	231
Grp Volume(v), veh/h	91	0	0	55	0	30	116	575	307	49	392	212
Grp Sat Flow(s),veh/h/ln	1602	0	0	1774	0	1576	1774	1695	1804	1774	1695	1813
Q Serve(g_s), s	3.6	0.0	0.0	2.0	0.0	1.2	4.1	6.5	6.5	1.8	4.5	4.6
Cycle Q Clear(g_c), s	3.6	0.0	0.0	2.0	0.0	1.2	4.1	6.5	6.5	1.8	4.5	4.6
Prop In Lane	0.19		0.81	1.00		1.00	1.00		0.15	1.00		0.13
Lane Grp Cap(c), veh/h	137	0	0	97	0	86	148	1733	922	64	1572	841
V/C Ratio(X)	0.67	0.00	0.00	0.56	0.00	0.35	0.78	0.33	0.33	0.76	0.25	0.25
Avail Cap(c_a), veh/h	768	0	0	856	0	760	208	1733	922	181	1572	841
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	0.0	0.0	29.8	0.0	29.5	29.1	9.3	9.3	30.9	10.5	10.5
Incr Delay (d2), s/veh	5.4	0.0	0.0	5.1	0.0	2.4	11.8	0.5	1.0	16.8	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	1.8	0.0	0.0	1.1	0.0	0.6	2.5	3.1	3.5	1.2	2.2	2.5
LnGrp Delay(d),s/veh	34.1	0.0	0.0	34.9	0.0	31.8	40.9	9.8	10.3	47.7	10.9	11.2
LnGrp LOS	C			C		C	D	A	B	D	B	B
Approach Vol, veh/h		91			85			998			653	
Approach Delay, s/veh		34.1			33.8			13.6			13.8	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	36.0		8.5	6.7	39.1		10.4				
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9				
Max Green Setting (Gmax), s	7.6	30.0		31.2	6.6	31.0		31.0				
Max Q Clear Time (g_c+I1), s	6.1	6.6		4.0	3.8	8.5		5.6				
Green Ext Time (p_c), s	0.0	3.5		0.3	0.0	5.4		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			15.6									
HCM 2010 LOS			B									
Notes												

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	86	9	33	903	94	8	642
Future Volume (veh/h)	86	9	33	903	94	8	642
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.97	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	93	10		982	102	9	698
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.92	0.92		0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	130	116		2854	296	17	3625
Arrive On Green	0.07	0.07		0.61	0.61	0.01	0.71
Sat Flow, veh/h	1774	1583		4835	483	1774	5253
Grp Volume(v), veh/h	93	10		713	371	9	698
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1760	1774	1695
Q Serve(g_s), s	2.5	0.3		5.1	5.1	0.2	2.2
Cycle Q Clear(g_c), s	2.5	0.3		5.1	5.1	0.2	2.2
Prop In Lane	1.00	1.00			0.27	1.00	
Lane Grp Cap(c), veh/h	130	116		2074	1077	17	3625
V/C Ratio(X)	0.72	0.09		0.34	0.34	0.54	0.19
Avail Cap(c_a), veh/h	1121	1001		2074	1077	145	3625
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.2	21.2		4.7	4.7	24.2	2.3
Incr Delay (d2), s/veh	7.2	0.3		0.5	0.9	24.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0		2.4	2.6	0.2	1.1
LnGrp Delay(d),s/veh	29.4	21.5		5.1	5.6	48.6	2.5
LnGrp LOS	C	C		A	A	D	A
Approach Vol, veh/h	103			1084			707
Approach Delay, s/veh	28.7			5.3			3.0
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.0		8.1	5.0	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		30.0		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		4.2		4.5	2.2	7.1		
Green Ext Time (p_c), s		4.6		0.2	0.0	7.0		

Intersection Summary	
HCM 2010 Ctrl Delay	5.7
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	68	61	962	92	557	111	534	549	489	302	0
Future Volume (veh/h)	27	68	61	962	92	557	111	534	549	489	302	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	29	74	66	1046	100	605	121	580	597	532	328	0
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	101	445	331	1138	745	621	148	727	844	587	1036	464
Arrive On Green	0.06	0.13	0.13	0.33	0.40	0.40	0.08	0.21	0.21	0.17	0.29	0.00
Sat Flow, veh/h	1774	3539	1583	3442	1863	1555	1774	3539	1561	3442	3539	1583
Grp Volume(v), veh/h	29	74	66	1046	100	605	121	580	597	532	328	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1555	1774	1770	1561	1721	1770	1583
Q Serve(g_s), s	1.9	2.2	4.1	35.1	4.1	45.9	8.1	18.7	24.7	18.2	8.7	0.0
Cycle Q Clear(g_c), s	1.9	2.2	4.1	35.1	4.1	45.9	8.1	18.7	24.7	18.2	8.7	0.0
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	101	445	331	1138	745	621	148	727	844	587	1036	464
V/C Ratio(X)	0.29	0.17	0.20	0.92	0.13	0.97	0.82	0.80	0.71	0.91	0.32	0.00
Avail Cap(c_a), veh/h	174	454	335	1276	747	623	223	727	844	611	1036	464
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	0.97	0.97	0.97	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.3	46.8	39.2	38.6	22.8	35.4	54.1	45.3	20.9	48.8	33.1	0.0
Incr Delay (d2), s/veh	1.6	0.2	0.3	10.1	0.1	29.3	13.1	8.6	4.8	16.9	0.8	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	1.0	1.1	1.8	18.3	2.1	24.7	4.5	10.0	15.8	10.0	4.4	0.0
LnGrp Delay(d),s/veh	55.8	47.0	39.5	48.7	22.9	64.7	67.2	53.9	25.7	65.8	33.9	0.0
LnGrp LOS	E	D	D	D	C	E	E	D	C	E	C	
Approach Vol, veh/h		169			1751			1298			860	
Approach Delay, s/veh		45.6			52.7			42.2			53.6	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.2	29.8	44.9	20.2	14.7	40.2	12.0	53.1
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 21	18.7	* 45	15.4	* 15	24.9	* 12	48.1
Max Q Clear Time (g_c+I1), s	20.2	26.7	37.1	6.1	10.1	10.7	3.9	47.9
Green Ext Time (p_c), s	0.3	0.0	2.6	0.3	0.1	1.6	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	49.3
HCM 2010 LOS	D

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	87	0	103	528	1066	0	0	431	785
Future Volume (veh/h)	0	0	0	87	0	103	528	1066	0	0	431	785
Number				3	8	18	5	2	12	1	6	16
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		0.89
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				95	0	112	574	1159	0	0	468	853
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
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	0	2	2
Cap, veh/h				155	0	138	604	4243	0	0	1551	647
Arrive On Green				0.09	0.00	0.09	0.34	0.83	0.00	0.00	0.46	0.46
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	3558	1414
Grp Volume(v), veh/h				95	0	112	574	1159	0	0	468	853
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1695	1414
Q Serve(g_s), s				6.7	0.0	9.0	41.0	6.4	0.0	0.0	11.3	59.5
Cycle Q Clear(g_c), s				6.7	0.0	9.0	41.0	6.4	0.0	0.0	11.3	59.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				155	0	138	604	4243	0	0	1551	647
V/C Ratio(X)				0.61	0.00	0.81	0.95	0.27	0.00	0.00	0.30	1.32
Avail Cap(c_a), veh/h				212	0	189	700	4243	0	0	1551	647
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.50	0.50	0.00	0.00	0.64	0.64
Uniform Delay (d), s/veh				57.2	0.0	58.3	41.8	2.3	0.0	0.0	22.2	35.3
Incr Delay (d2), s/veh				3.9	0.0	17.0	12.9	0.1	0.0	0.0	0.3	150.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.5	0.0	4.6	22.3	2.9	0.0	0.0	5.3	50.2
LnGrp Delay(d),s/veh				61.2	0.0	75.3	54.7	2.4	0.0	0.0	22.5	185.4
LnGrp LOS				E		E	D	A			C	F
Approach Vol, veh/h					207			1733			1321	
Approach Delay, s/veh					68.8			19.7			127.7	
Approach LOS					E			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		113.6			49.0	64.6		16.4
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		104.3			* 51	48.3		15.5
Max Q Clear Time (g_c+I1), s		8.4			43.0	61.5		11.0
Green Ext Time (p_c), s		10.0			1.3	0.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	66.6
HCM 2010 LOS	E

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	685	4	486	0	0	0	0	908	98	117	413	0
Future Volume (veh/h)	685	4	486	0	0	0	0	908	98	117	413	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	638	153	528				0	987	107	127	449	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
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				0	2	2	2	2	0
Cap, veh/h	797	165	571				0	1393	151	152	1547	0
Arrive On Green	0.45	0.45	0.45				0.00	0.30	0.30	0.09	0.44	0.00
Sat Flow, veh/h	1774	368	1270				0	4820	503	1774	3632	0
Grp Volume(v), veh/h	638	0	681				0	719	375	127	449	0
Grp Sat Flow(s),veh/h/ln	1774	0	1639				0	1695	1766	1774	1770	0
Q Serve(g_s), s	27.8	0.0	35.2				0.0	17.0	17.0	6.3	7.4	0.0
Cycle Q Clear(g_c), s	27.8	0.0	35.2				0.0	17.0	17.0	6.3	7.4	0.0
Prop In Lane	1.00		0.78				0.00		0.28	1.00		0.00
Lane Grp Cap(c), veh/h	797	0	736				0	1015	529	152	1547	0
V/C Ratio(X)	0.80	0.00	0.92				0.00	0.71	0.71	0.84	0.29	0.00
Avail Cap(c_a), veh/h	846	0	781				0	1015	529	152	1547	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.61	0.61	0.00
Uniform Delay (d), s/veh	21.3	0.0	23.3				0.0	28.0	28.1	40.5	16.3	0.0
Incr Delay (d2), s/veh	5.3	0.0	16.2				0.0	4.2	7.9	21.4	0.3	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
%ile BackOfQ(50%),veh/ln	14.6	0.0	19.2				0.0	8.5	9.4	4.0	3.6	0.0
LnGrp Delay(d),s/veh	26.5	0.0	39.6				0.0	32.2	35.9	61.9	16.6	0.0
LnGrp LOS	C		D					C	D	E	B	
Approach Vol, veh/h		1319						1094			576	
Approach Delay, s/veh		33.3						33.5			26.6	
Approach LOS		C						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	12.4	32.0		45.6		44.4		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 7.7	24.5		42.9		36.9		
Max Q Clear Time (g_c+I1), s	8.3	19.0		37.2		9.4		
Green Ext Time (p_c), s	0.0	3.0		3.2		2.8		

Intersection Summary		
HCM 2010 Ctrl Delay		32.1
HCM 2010 LOS		C

Notes

LOS Engineering, Inc.

Intersection	
Intersection Delay, s/veh	54.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	367	25	38	4	11	201	18	425	6	249	393	220
Future Vol, veh/h	367	25	38	4	11	201	18	425	6	249	393	220
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	399	27	41	4	12	218	20	462	7	271	427	239
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	40.8	35.5	57.6	63.7
HCM LOS	E	E	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	70%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	96%	0%	12%	0%	100%	0%	0%	100%	37%
Vol Right, %	0%	0%	4%	0%	18%	0%	0%	100%	0%	0%	63%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	18	283	148	217	213	4	11	201	249	262	351
LT Vol	18	0	0	217	150	4	0	0	249	0	0
Through Vol	0	283	142	0	25	0	11	0	0	262	131
RT Vol	0	0	6	0	38	0	0	201	0	0	220
Lane Flow Rate	20	308	161	235	232	4	12	218	271	285	382
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.064	0.963	0.501	0.753	0.725	0.015	0.04	0.693	0.81	0.811	1.039
Departure Headway (Hd)	12.06	11.541	11.512	11.624	11.252	12.923	12.406	11.682	10.776	10.258	9.802
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	299	317	315	313	320	279	290	312	338	353	374
Service Time	9.76	9.241	9.212	9.324	9.052	10.623	10.106	9.382	8.497	7.978	7.523
HCM Lane V/C Ratio	0.067	0.972	0.511	0.751	0.725	0.014	0.041	0.699	0.802	0.807	1.021
HCM Control Delay	15.6	77.1	25.2	42.6	39	15.8	15.6	37	46.7	45	89.6
HCM Lane LOS	C	F	D	E	E	C	C	E	E	E	F
HCM 95th-tile Q	0.2	9.9	2.7	5.7	5.3	0	0.1	4.8	6.9	7	12.9

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	815	271	0	0	0	165
Future Vol, veh/h	815	271	0	0	0	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	-	-	-	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	886	295	0	0	0	179

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	443
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	481
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	481
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	481	-	-	-
HCM Lane V/C Ratio	0.373	-	-	-
HCM Control Delay (s)	16.9	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	1.7	-	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	149	714	117	119	1210	16	208	11	81	20	12	59
Future Vol, veh/h	149	714	117	119	1210	16	208	11	81	20	12	59
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	250	-	250	250	-	400	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	162	776	127	129	1315	17	226	12	88	22	13	64

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1332	0	0	903	0	0	1891	2690	388	2213	2800	658
Stage 1	-	-	-	-	-	-	1100	1100	-	1573	1573	-
Stage 2	-	-	-	-	-	-	791	1590	-	640	1227	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	270	-	-	436	-	-	~ 74	21	522	47	18	349
Stage 1	-	-	-	-	-	-	~ 170	286	-	78	169	-
Stage 2	-	-	-	-	-	-	317	166	-	392	249	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	270	-	-	436	-	-	-	~ 6	522	-	~ 5	349
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 6	-	-	~ 5	-
Stage 1	-	-	-	-	-	-	~ 68	114	-	31	119	-
Stage 2	-	-	-	-	-	-	~ 162	117	-	117	100	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.5	1.5		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	46	270	-	-	436	-	-	-
HCM Lane V/C Ratio	-	2.174	0.6	-	-	0.297	-	-	-
HCM Control Delay (s)	-	$ 729.9	36.5	-	-	16.7	-	-	-
HCM Lane LOS	-	F	E	-	-	C	-	-	-
HCM 95th %tile Q(veh)	-	10.4	3.6	-	-	1.2	-	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	391	157	95	822	70	149	13	63	117	15	355
Future Volume (veh/h)	184	391	157	95	822	70	149	13	63	117	15	355
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	200	425	171	103	893	76	162	14	68	127	0	397
Adj No. of Lanes	2	3	1	1	3	1	2	1	0	1	0	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	264	1164	363	130	1171	365	228	36	173	662	0	1362
Arrive On Green	0.08	0.23	0.23	0.07	0.23	0.23	0.07	0.13	0.13	0.37	0.00	0.43
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	3442	277	1348	1774	0	3167
Grp Volume(v), veh/h	200	425	171	103	893	76	162	0	82	127	0	397
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1721	0	1625	1774	0	1583
Q Serve(g_s), s	5.9	7.3	9.6	5.9	16.9	4.0	4.8	0.0	4.8	5.0	0.0	8.4
Cycle Q Clear(g_c), s	5.9	7.3	9.6	5.9	16.9	4.0	4.8	0.0	4.8	5.0	0.0	8.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	264	1164	363	130	1171	365	228	0	208	662	0	1362
V/C Ratio(X)	0.76	0.37	0.47	0.79	0.76	0.21	0.71	0.00	0.39	0.19	0.00	0.29
Avail Cap(c_a), veh/h	300	1330	414	227	1576	491	337	0	252	662	0	1362
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.7	33.5	34.4	47.1	37.1	32.1	47.2	0.0	41.3	21.9	0.0	19.2
Incr Delay (d2), s/veh	9.3	0.2	1.0	10.3	1.6	0.3	4.1	0.0	1.2	0.6	0.0	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	3.1	3.4	4.3	3.3	8.1	1.8	2.4	0.0	2.2	2.6	0.0	3.8
LnGrp Delay(d),s/veh	56.1	33.7	35.4	57.3	38.6	32.4	51.3	0.0	42.5	22.5	0.0	19.7
LnGrp LOS	E	C	D	E	D	C	D		D	C		B
Approach Vol, veh/h		796			1072			244			524	
Approach Delay, s/veh		39.7			40.0			48.4			20.4	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	30.9	11.3	48.9	11.9	31.1	42.5	17.7
Change Period (Y+Rc), s	4.5	7.3	4.5	* 4.5	4.0	* 7.3	4.0	4.5
Max Green Setting (Gmax), s	13.2	27.0	10.1	* 44	9.0	* 32	38.5	16.0
Max Q Clear Time (g_c+I1), s	7.9	11.6	6.8	10.4	7.9	18.9	7.0	6.8
Green Ext Time (p_c), s	0.1	2.7	0.1	1.6	0.1	4.9	0.3	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	36.8
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↱			↑↑↑	↱			↱			↱
Traffic Vol, veh/h	0	577	5	0	883	35	0	0	5	0	0	141
Future Vol, veh/h	0	577	5	0	883	35	0	0	5	0	0	141
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	627	5	0	960	38	0	0	5	0	0	153

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	316	-	-	480
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	580	0	0	455
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	580	-	-	455
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.3	16.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	580	-	-	-	-	455
HCM Lane V/C Ratio	0.009	-	-	-	-	0.337
HCM Control Delay (s)	11.3	-	-	-	-	16.9
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	-	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	309	105	29	451	155	173	34	53	219	57	297
Future Volume (veh/h)	168	309	105	29	451	155	173	34	53	219	57	297
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	183	336	114	32	490	168	188	37	58	238	62	323
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	265	1105	339	86	840	257	227	239	375	249	710	1060
Arrive On Green	0.08	0.22	0.22	0.02	0.17	0.17	0.13	0.37	0.37	0.14	0.38	0.38
Sat Flow, veh/h	3442	5085	1559	3442	5085	1557	1774	650	1018	1774	1863	2782
Grp Volume(v), veh/h	183	336	114	32	490	168	188	0	95	238	62	323
Grp Sat Flow(s),veh/h/ln	1721	1695	1559	1721	1695	1557	1774	0	1668	1774	1863	1391
Q Serve(g_s), s	4.4	4.7	5.3	0.8	7.6	8.6	8.8	0.0	3.3	11.4	1.8	7.0
Cycle Q Clear(g_c), s	4.4	4.7	5.3	0.8	7.6	8.6	8.8	0.0	3.3	11.4	1.8	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.61	1.00		1.00
Lane Grp Cap(c), veh/h	265	1105	339	86	840	257	227	0	614	249	710	1060
V/C Ratio(X)	0.69	0.30	0.34	0.37	0.58	0.65	0.83	0.00	0.15	0.96	0.09	0.30
Avail Cap(c_a), veh/h	471	2439	748	181	2010	615	328	0	614	249	710	1060
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.5	28.0	28.3	41.0	33.0	33.4	36.4	0.0	18.1	36.5	16.9	18.5
Incr Delay (d2), s/veh	3.2	0.2	0.6	2.7	0.6	2.8	11.2	0.0	0.5	44.8	0.2	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	2.2	2.2	2.3	0.4	3.6	3.9	5.0	0.0	1.6	8.7	1.0	2.8
LnGrp Delay(d),s/veh	41.7	28.2	28.8	43.7	33.6	36.2	47.6	0.0	18.6	81.3	17.2	19.3
LnGrp LOS	D	C	C	D	C	D	D		B	F	B	B
Approach Vol, veh/h		633			690			283			623	
Approach Delay, s/veh		32.2			34.7			37.9			42.7	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	40.0	10.6	20.0	16.0	38.9	6.1	24.5
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	15.8	27.4	11.7	33.8	12.0	* 32	4.5	41.0
Max Q Clear Time (g_c+I1), s	10.8	9.0	6.4	10.6	13.4	5.3	2.8	7.3
Green Ext Time (p_c), s	0.2	1.5	0.2	3.5	0.0	0.4	0.0	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	36.6
HCM 2010 LOS	D

Notes

Appendix T

Near-Term Year 2020 with Project Intersection LOS Calculations with Mitigation

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	33	0	70	441	1071	0	0	373	566
Future Volume (veh/h)	0	0	0	33	0	70	441	1071	0	0	373	566
Number				3	8	18	5	2	12	1	6	16
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		0.94
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				36	0	76	479	1164	0	0	405	615
Adj No. of Lanes				0	1	1	1	3	0	0	1	2
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	0	2	2
Cap, veh/h				121	0	108	472	4089	0	0	892	1421
Arrive On Green				0.07	0.00	0.07	0.53	1.00	0.00	0.00	0.48	0.48
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	1863	2965
Grp Volume(v), veh/h				36	0	76	479	1164	0	0	405	615
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1863	1483
Q Serve(g_s), s				1.5	0.0	3.8	21.3	0.0	0.0	0.0	11.6	10.9
Cycle Q Clear(g_c), s				1.5	0.0	3.8	21.3	0.0	0.0	0.0	11.6	10.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				121	0	108	472	4089	0	0	892	1421
V/C Ratio(X)				0.30	0.00	0.70	1.01	0.28	0.00	0.00	0.45	0.43
Avail Cap(c_a), veh/h				342	0	305	472	4089	0	0	892	1421
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	0.00	1.00	0.54	0.54	0.00	0.00	0.87	0.87
Uniform Delay (d), s/veh				35.4	0.0	36.5	18.7	0.0	0.0	0.0	13.9	13.7
Incr Delay (d2), s/veh				1.3	0.0	8.0	34.0	0.1	0.0	0.0	1.5	0.8
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				0.8	0.0	1.9	14.4	0.0	0.0	0.0	6.3	4.6
LnGrp Delay(d),s/veh				36.8	0.0	44.4	52.7	0.1	0.0	0.0	15.3	14.5
LnGrp LOS				D		D	F	A			B	B
Approach Vol, veh/h					112			1643			1020	
Approach Delay, s/veh					42.0			15.4			14.8	
Approach LOS					D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		69.4			26.0	43.4		10.6
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		54.4			* 21	28.4		15.4
Max Q Clear Time (g_c+I1), s		2.0			23.3	13.6		5.8
Green Ext Time (p_c), s		9.8			0.0	4.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	386	6	15	0	22	211	34	415	0	92	349	454
Future Volume (veh/h)	386	6	15	0	22	211	34	415	0	92	349	454
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		1.00	1.00		0.76
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	440	0	0	0	24	229	37	451	0	100	379	493
Adj No. of Lanes	2	1	0	2	1	1	1	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	724	380	0	608	329	275	51	1531	0	129	610	417
Arrive On Green	0.20	0.00	0.00	0.00	0.18	0.18	0.03	0.30	0.00	0.07	0.34	0.34
Sat Flow, veh/h	3548	1863	0	3442	1863	1556	1774	5253	0	1774	1770	1209
Grp Volume(v), veh/h	440	0	0	0	24	229	37	451	0	100	379	493
Grp Sat Flow(s),veh/h/ln	1774	1863	0	1721	1863	1556	1774	1695	0	1774	1770	1209
Q Serve(g_s), s	8.3	0.0	0.0	0.0	0.8	10.4	1.5	5.0	0.0	4.1	13.1	25.3
Cycle Q Clear(g_c), s	8.3	0.0	0.0	0.0	0.8	10.4	1.5	5.0	0.0	4.1	13.1	25.3
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	724	380	0	608	329	275	51	1531	0	129	610	417
V/C Ratio(X)	0.61	0.00	0.00	0.00	0.07	0.83	0.72	0.29	0.00	0.78	0.62	1.18
Avail Cap(c_a), veh/h	779	409	0	751	406	339	111	1531	0	242	610	417
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	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	0.0	0.0	25.2	29.2	35.3	19.7	0.0	33.4	20.0	24.0
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.0	0.1	13.5	17.3	0.1	0.0	9.5	1.9	104.0
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	4.2	0.0	0.0	0.0	0.4	5.5	1.0	2.4	0.0	2.3	6.6	20.4
LnGrp Delay(d),s/veh	27.7	0.0	0.0	0.0	25.3	42.7	52.7	19.8	0.0	43.0	22.0	128.0
LnGrp LOS	C				C	D	D	B		D	C	F
Approach Vol, veh/h		440			253			488			972	
Approach Delay, s/veh		27.7			41.0			22.3			77.9	
Approach LOS		C			D			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.8	26.6		19.5	6.6	29.8		17.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	10.0	19.9		16.1	4.6	25.3		16.0
Max Q Clear Time (g_c+I1), s	6.1	7.0		10.3	3.5	27.3		12.4
Green Ext Time (p_c), s	0.1	2.2		0.8	0.0	0.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	50.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	1040	82	55	421	1	137	7	53	35	6	91
Future Volume (veh/h)	93	1040	82	55	421	1	137	7	53	35	6	91
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	101	1130	89	60	458	1	149	8	58	38	7	99
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	129	1642	511	81	1503	468	233	26	186	58	11	150
Arrive On Green	0.07	0.32	0.32	0.05	0.30	0.30	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	195	1417	433	80	1129
Grp Volume(v), veh/h	101	1130	89	60	458	1	149	0	66	144	0	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	0	1613	1642	0	0
Q Serve(g_s), s	2.7	9.5	2.0	1.6	3.4	0.0	3.9	0.0	1.8	4.1	0.0	0.0
Cycle Q Clear(g_c), s	2.7	9.5	2.0	1.6	3.4	0.0	3.9	0.0	1.8	4.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.88	0.26		0.69
Lane Grp Cap(c), veh/h	129	1642	511	81	1503	468	233	0	211	219	0	0
V/C Ratio(X)	0.78	0.69	0.17	0.74	0.30	0.00	0.64	0.00	0.31	0.66	0.00	0.00
Avail Cap(c_a), veh/h	253	2024	630	163	1765	549	616	0	560	536	0	0
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	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.3	14.4	11.9	23.1	13.4	12.2	20.2	0.0	19.3	20.2	0.0	0.0
Incr Delay (d2), s/veh	9.8	0.7	0.2	12.5	0.1	0.0	2.9	0.0	0.8	3.4	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	1.7	4.5	0.9	1.1	1.6	0.0	2.1	0.0	0.9	2.0	0.0	0.0
LnGrp Delay(d),s/veh	32.1	15.2	12.1	35.6	13.5	12.2	23.1	0.0	20.1	23.5	0.0	0.0
LnGrp LOS	C	B	B	D	B	B	C		C	C		
Approach Vol, veh/h		1320			519			215			144	
Approach Delay, s/veh		16.3			16.0			22.2			23.5	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		10.9	6.7	20.3		11.0	8.1	19.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		17.0	4.5	19.5		16.0	7.0	17.0
Max Q Clear Time (g_c+I1), s		5.9	3.6	11.5		6.1	4.7	5.4
Green Ext Time (p_c), s		0.5	0.0	4.3		0.4	0.0	2.1

Intersection Summary		
HCM 2010 Ctrl Delay		17.3
HCM 2010 LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	87	0	103	528	1066	0	0	431	785
Future Volume (veh/h)	0	0	0	87	0	103	528	1066	0	0	431	785
Number				3	8	18	5	2	12	1	6	16
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		0.81
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				95	0	112	574	1159	0	0	468	853
Adj No. of Lanes				0	1	1	1	3	0	0	1	2
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	0	2	2
Cap, veh/h				169	0	151	538	4025	0	0	812	1114
Arrive On Green				0.10	0.00	0.10	0.61	1.00	0.00	0.00	0.44	0.44
Sat Flow, veh/h				1774	0	1583	1774	5253	0	0	1863	2556
Grp Volume(v), veh/h				95	0	112	574	1159	0	0	468	853
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	0	0	1863	1278
Q Serve(g_s), s				4.6	0.0	6.2	27.3	0.0	0.0	0.0	17.0	25.4
Cycle Q Clear(g_c), s				4.6	0.0	6.2	27.3	0.0	0.0	0.0	17.0	25.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				169	0	151	538	4025	0	0	812	1114
V/C Ratio(X)				0.56	0.00	0.74	1.07	0.29	0.00	0.00	0.58	0.77
Avail Cap(c_a), veh/h				304	0	271	538	4025	0	0	812	1114
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	0.00	1.00	0.50	0.50	0.00	0.00	0.57	0.57
Uniform Delay (d), s/veh				38.9	0.0	39.6	17.7	0.0	0.0	0.0	19.1	21.5
Incr Delay (d2), s/veh				2.9	0.0	7.0	47.1	0.1	0.0	0.0	1.7	2.9
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				2.4	0.0	3.0	19.9	0.0	0.0	0.0	9.1	9.3
LnGrp Delay(d),s/veh				41.8	0.0	46.7	64.8	0.1	0.0	0.0	20.8	24.4
LnGrp LOS				D		D	F	A			C	C
Approach Vol, veh/h					207			1733			1321	
Approach Delay, s/veh					44.4			21.5			23.1	
Approach LOS					D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		76.3			32.0	44.3		13.7
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		64.4			* 27	32.4		15.4
Max Q Clear Time (g_c+I1), s		2.0			29.3	27.4		8.2
Green Ext Time (p_c), s		9.9			0.0	3.0		0.4

Intersection Summary		
HCM 2010 Ctrl Delay		23.6
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	367	25	38	4	11	201	18	425	6	249	393	220
Future Volume (veh/h)	367	25	38	4	11	201	18	425	6	249	393	220
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.84	1.00		0.73	1.00		0.74
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	457	0	0	4	12	218	20	462	7	271	427	239
Adj No. of Lanes	2	1	0	2	1	1	1	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	676	355	0	686	371	264	32	1049	16	308	702	381
Arrive On Green	0.19	0.00	0.00	0.20	0.20	0.20	0.02	0.20	0.20	0.17	0.36	0.36
Sat Flow, veh/h	3548	1863	0	3442	1863	1326	1774	5129	77	1774	1949	1058
Grp Volume(v), veh/h	457	0	0	4	12	218	20	304	165	271	387	279
Grp Sat Flow(s),veh/h/ln	1774	1863	0	1721	1863	1326	1774	1695	1816	1774	1770	1237
Q Serve(g_s), s	9.3	0.0	0.0	0.1	0.4	12.2	0.9	6.1	6.2	11.6	13.9	14.5
Cycle Q Clear(g_c), s	9.3	0.0	0.0	0.1	0.4	12.2	0.9	6.1	6.2	11.6	13.9	14.5
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.04	1.00		0.86
Lane Grp Cap(c), veh/h	676	355	0	686	371	264	32	693	371	308	637	446
V/C Ratio(X)	0.68	0.00	0.00	0.01	0.03	0.82	0.62	0.44	0.44	0.88	0.61	0.63
Avail Cap(c_a), veh/h	731	384	0	709	384	273	94	720	386	308	637	446
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	0.0	0.0	24.9	25.0	29.8	37.9	27.0	27.0	31.3	20.3	20.5
Incr Delay (d2), s/veh	2.3	0.0	0.0	0.0	0.0	17.8	18.2	0.4	0.8	23.8	1.6	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	0.0	0.0	0.2	5.8	0.6	2.9	3.2	7.7	7.1	5.2
LnGrp Delay(d),s/veh	31.5	0.0	0.0	24.9	25.1	47.6	56.1	27.4	27.9	55.1	22.0	23.3
LnGrp LOS	C			C	C	D	E	C	C	E	C	C
Approach Vol, veh/h		457			234			489			937	
Approach Delay, s/veh		31.5			46.1			28.7			31.9	
Approach LOS		C			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.0	20.4		19.3	5.9	32.5		20.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	13.5	16.5		16.0	4.1	25.9		16.0				
Max Q Clear Time (g_c+I1), s	13.6	8.2		11.3	2.9	16.5		14.2				
Green Ext Time (p_c), s	0.0	1.7		0.7	0.0	2.9		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			32.7									
HCM 2010 LOS			C									
Notes												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	714	117	119	1210	16	208	11	81	20	12	59
Future Volume (veh/h)	149	714	117	119	1210	16	208	11	81	20	12	59
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	162	776	127	129	1315	17	226	12	88	22	13	64
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	203	1767	550	165	1659	506	295	32	236	35	21	102
Arrive On Green	0.11	0.35	0.35	0.09	0.33	0.33	0.17	0.17	0.17	0.10	0.10	0.10
Sat Flow, veh/h	1774	5085	1583	1774	5085	1550	1774	193	1419	368	217	1070
Grp Volume(v), veh/h	162	776	127	129	1315	17	226	0	100	99	0	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1550	1774	0	1612	1655	0	0
Q Serve(g_s), s	5.4	7.1	3.4	4.3	14.2	0.5	7.4	0.0	3.3	3.5	0.0	0.0
Cycle Q Clear(g_c), s	5.4	7.1	3.4	4.3	14.2	0.5	7.4	0.0	3.3	3.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.88	0.22		0.65
Lane Grp Cap(c), veh/h	203	1767	550	165	1659	506	295	0	268	157	0	0
V/C Ratio(X)	0.80	0.44	0.23	0.78	0.79	0.03	0.77	0.00	0.37	0.63	0.00	0.00
Avail Cap(c_a), veh/h	235	1767	550	262	1811	552	485	0	441	439	0	0
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	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.1	15.2	14.0	26.8	18.5	13.9	24.1	0.0	22.4	26.3	0.0	0.0
Incr Delay (d2), s/veh	15.4	0.2	0.2	7.7	2.3	0.0	4.2	0.0	0.9	4.1	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	3.5	3.3	1.5	2.5	6.9	0.2	3.9	0.0	1.5	1.8	0.0	0.0
LnGrp Delay(d),s/veh	41.4	15.3	14.2	34.5	20.8	13.9	28.2	0.0	23.2	30.4	0.0	0.0
LnGrp LOS	D	B	B	C	C	B	C		C	C		
Approach Vol, veh/h		1065			1461			326			99	
Approach Delay, s/veh		19.2			21.9			26.7			30.4	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.5	10.1	25.5		10.2	11.4	24.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		16.5	8.9	20.6		16.0	8.0	21.5
Max Q Clear Time (g_c+I1), s		9.4	6.3	9.1		5.5	7.4	16.2
Green Ext Time (p_c), s		0.7	0.1	4.0		0.3	0.0	3.5

Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

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Appendix U

Compound Growth Calculations

Segment Growth Forecast for Otay Mesa PA61 Project for the roadway segments noted below

Roadway Segment	Existing Year 2018 Volume	SANDAG S12 Yr 2020 Unadj. Vol.	SANDAG S12 Yr 2050 Unadj. Vol.	Annual Growth Rate over 30 years (2050 - 2020 = 30)	Forecasted Year 2062 (2062 - 2018 = 44)	Adjustments (rounded)
Ocean View Hills Parkway						
Starfish Way/Westport View to Sea Drift Way	12,963	16,300	21,800	0.97%	19,856	19,900
Sea Drift Way to Del Sol Blvd	10,919	15,400	21,500	1.12%	17,813	17,800
Del Sol Blvd to Sea Fire Pt	10,048	18,000	26,600	1.31%	17,817	17,800
Sea Fire Pt to Hidden Trails Rd	9,591	18,000	26,600	1.31%	17,007	17,000
Hidden Trails Rd to Otay Mesa Rd	11,405	17,900	21,200	0.57%	18,295	18,300
Otay Mesa Road						
Ocean View Hills Pkwy to Proj. W. Access	16,330	29,300	53,700	2.04%	39,708	39,700
Proj. W. Access to Emerald Crest Ct	16,330	29,300	53,700	2.04%	39,708	39,700
Emerald Crest Ct to Corporate Center Dr	15,855	25,800	45,900	1.94%	36,908	36,900
Corporate Center Dr to Innovative Dr	10,499	20,500	32,000	1.50%	20,174	20,200
Innovative Dr to Heritage Rd	11,864	20,500	32,000	1.50%	22,797	22,800
SR 905						
I-805 to Caliente Ave	79,000	125,600	165,800	0.93%	118,713	118,700
Caliente Ave to Britannia Blvd	70,000	106,800	147,200	1.08%	112,062	112,100

Notes:
Annual growth rate = ((SANDAG Series 12 unadjusted 2050 ADT / SANDAG S12 unadj. 2020 ADT) raised 1/30) - 1.
Example growth rate calc for Ocean View Hills Pkwy btw Starfish and Sea Drift: (21,800/16,300) to the power of 1/30 all less 1 = 0.97%
Example forecast for Ocean View Hills Pkwy btw Starfish and Sea Drift: Power (1.097 growth %, 44 years) x 12,963 year 2018 ADT = 19,856

Appendix V

Horizon Year Turn Movements

Approach Leg	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Approach ADT by year	Existing		Horizon	Existing		Horizon	Existing		Horizon	Existing		Horizon
1) Oceanview/Starfish	12963		19900	1000		1100	1000		1100	1000		1100
AM 2018	2	542	28	42	543	22	60	4	4	68	7	53
AM 2062	20	830	50	50	610	30	70	10	20	90	10	60
PM 2018	(4)	(563)	(25)	(147)	(471)	(20)	(14)	(1)	(4)	(13)	()	(53)
PM 2062	(20)	(860)	(50)	(160)	(670)	(20)	(20)	(10)	(30)	(40)	(10)	(60)
2) Oceanview/Seadrift	10919		17800	12963		19900	1000		1100	1000		1100
AM 2018	8	520			494	90	82		26			
AM 2062	20	850			600	140	90		40			
PM 2018	(21)	(548)			(447)	(50)	(37)		(22)			
PM 2062	(30)	(710)			(670)	(80)	(40)		(30)			
3) Oceanview/DelSol	10084		17800	10919		17800	10700		12500	1000		1100
AM 2018	318	185	13	18	217	277	305	22	356	3	36	33
AM 2062	560	330	30	30	350	360	440	30	420	20	40	40
PM 2018	(115)	(446)	(11)	(35)	(283)	(153)	(99)	(2)	(77)	(4)	(3)	(20)
PM 2062	(200)	(790)	(30)	(60)	(460)	(290)	(160)	(10)	(130)	(20)	(10)	(20)
4) Oceanview/SeaFire	9591		17000	10048		17800	1000		1100	1000		1100
AM 2018	3	460	6	26	546	4	3	0	4	10	0	42
AM 2062	60	820	20	50	900	20	40	10	140	40	10	50
PM 2018	(1)	(559)	(21)	(45)	(321)	()	(3)	()	(5)	(13)	()	(28)
PM 2062	(150)	(850)	(40)	(80)	(550)	(30)	(20)	(10)	(90)	(40)	(10)	(30)
5) Oceanview/HiddenTrails	11405		14600	9591		17000				1000		1100
AM 2018	54	487	14	5	502					51		9
AM 2062	70	700	40	10	890					80		10
PM 2018	(33)	(566)	(48)	(8)	(331)					(27)		(9)
PM 2062	(40)	(1120)	(90)	(10)	(590)					(80)		(10)
6) OtayMesa/Caliente/Oceanvi	20951		36900	11405		14600	1000		2000	16330		39700
AM 2018	5	347	553	152	487	1	0	0	5	257	1	67
AM 2062	100	410	740	360	800	10	50	80	100	380	90	190
PM 2018	(22)	(486)	(311)	(124)	(228)	()	(2)	()	(16)	(697)	(7)	(198)
PM 2062	(110)	(860)	(480)	(330)	(400)	(10)	(50)	(90)	(80)	(1100)	(110)	(440)
7) Caliente/SR905 WB Ramp	14288		15900	20951		36900				1500		3700
AM 2018	276	812			246	469				21	0	59
AM 2062	450	1100			430	600				50	10	150
PM 2018	(458)	(790)			(220)	(684)				(36)	()	(84)
PM 2062	(530)	(1180)			(420)	(1100)				(90)	(10)	(210)
8) Caliente/SR905 EB Ramp	7947		24000	14288		15900	10300		12400			
AM 2018		511	59	89	264		589	1	486			
AM 2062		900	180	110	390		680	10	550			
PM 2018		(681)	(76)	(98)	(170)		(565)	(4)	(322)			
PM 2062		(1050)	(230)	(110)	(410)		(670)	(10)	(500)			
9) Caliente/Airway	28700		40400	23700		24000	11900		14300	6800		22700
AM 2018	4	195	0	33	277	425	365	1	7	0	1	55
AM 2062	40	420	10	90	350	450	440	10	20	10	30	220
PM 2018	(5)	(308)	(6)	(92)	(171)	(192)	(326)	(5)	(7)	(4)	(2)	(110)
PM 2062	(20)	(430)	(10)	(250)	(400)	(220)	(390)	(30)	(40)	(10)	(20)	(370)
10) OtayMesa/Proj W Dwy							16330		39700			
AM 2018								705	0			
AM 2062								1300	0			
PM 2018								(435)	()			
PM 2062								(1060)	()			
11) OtayMesa/Emerald/Proj E	1000		1100	1000		1100	16330		39700	15855		36900
AM 2018	0	0	0	0	0	72	0	705	0	0	253	1
AM 2062	NA	NA	30	NA	NA	100	NA	1400	80	NA	590	10
PM 2018	()	()	()	()	()	(42)	()	(435)	()	()	(860)	(16)
PM 2062	NA	NA	(40)	NA	NA	(70)	NA	(960)	(110)	NA	(1600)	(40)
12) OtayMesa/Corporate	1000		1100	11000		17600	15855		36900	10499		20200
AM 2018	0	0	0	28	0	88	325	320	0	1	197	38
AM 2062	190	10	50	30	20	140	400	740	120	80	380	70
PM 2018	()	()	()	(117)	()	(337)	(161)	(239)	()	(19)	(548)	(70)
PM 2062	(250)	(20)	(70)	(120)	(20)	(380)	(200)	(560)	(160)	(120)	(1050)	(130)
13) OtayMesa/Innovative Dr	100		110	1000		1100	10499		20200	11864		22800
AM 2018	0	0	5	0	0	47	0	430	3	0	272	34
AM 2062	0	0	10	0	0	50	0	830	10	0	520	70
PM 2018	()	()	(5)	()	()	(113)	()	(361)	(5)	()	(554)	(29)
PM 2062	()	()	(10)	()	()	(150)	()	(690)	(10)	()	(940)	(60)
14) OtayMesa/Heritage	4600		10700	10300		25300	11864		22800	23700		29800
AM 2018	54	33	38	86	23	63	126	118	105	37	137	116
AM 2062	130	80	90	210	60	150	240	290	150	50	230	150
PM 2018	(123)	(33)	(43)	(197)	(56)	(223)	(116)	(183)	(67)	(24)	(246)	(155)
PM 2062	(290)	(80)	(100)	(250)	(140)	(330)	(220)	(350)	(130)	(30)	(450)	(190)

The above factoring is a starting point to which some volumes balanced to keep volumes at +/- 200 between intersection and some volumes adjusted to account for cumulative traffic. Segments with no avaliable SANDAG data (i.e. Starfish Way) were increase by 10% (near term 1,000 and long term 1,100). NA: Not Applicable becuase cumulative traffic is the only traffic on some approach legs, thus no background to forecast.

Appendix W

Horizon Year 2062 without Project Level of Service Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	10	20	90	10	60	20	830	50	50	610	30
Future Volume (veh/h)	70	10	20	90	10	60	20	830	50	50	610	30
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.98	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	76	11	22	98	11	65	22	902	54	54	663	33
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	124	18	36	134	15	89	36	1271	76	71	1352	67
Arrive On Green	0.10	0.10	0.10	0.14	0.14	0.14	0.02	0.38	0.38	0.04	0.39	0.39
Sat Flow, veh/h	1213	176	351	958	108	635	1774	3388	203	1774	3426	170
Grp Volume(v), veh/h	109	0	0	174	0	0	22	471	485	54	342	354
Grp Sat Flow(s),veh/h/ln	1739	0	0	1701	0	0	1774	1770	1822	1774	1770	1827
Q Serve(g_s), s	3.5	0.0	0.0	5.7	0.0	0.0	0.7	13.2	13.2	1.8	8.5	8.5
Cycle Q Clear(g_c), s	3.5	0.0	0.0	5.7	0.0	0.0	0.7	13.2	13.2	1.8	8.5	8.5
Prop In Lane	0.70		0.20	0.56		0.37	1.00		0.11	1.00		0.09
Lane Grp Cap(c), veh/h	178	0	0	238	0	0	36	664	683	71	698	721
V/C Ratio(X)	0.61	0.00	0.00	0.73	0.00	0.00	0.60	0.71	0.71	0.76	0.49	0.49
Avail Cap(c_a), veh/h	804	0	0	787	0	0	128	664	683	125	698	721
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	0.0	0.0	24.1	0.0	0.0	28.4	15.5	15.5	27.7	13.3	13.3
Incr Delay (d2), s/veh	3.4	0.0	0.0	4.3	0.0	0.0	15.0	6.3	6.2	15.3	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.0	2.9	0.0	0.0	0.5	7.6	7.8	1.2	4.6	4.7
LnGrp Delay(d),s/veh	28.5	0.0	0.0	28.3	0.0	0.0	43.3	21.9	21.7	43.1	15.7	15.7
LnGrp LOS	C			C			D	C	C	D	B	B
Approach Vol, veh/h		109			174			978			750	
Approach Delay, s/veh		28.5			28.3			22.3			17.7	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	28.8		13.1	6.7	27.7		10.9
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	4.2	* 22		27.0	4.1	21.9		27.0
Max Q Clear Time (g_c+I1), s	2.7	10.5		7.7	3.8	15.2		5.5
Green Ext Time (p_c), s	0.0	3.0		0.8	0.0	3.0		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	21.4
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	90	40	20	850	600	140
Future Vol, veh/h	90	40	20	850	600	140
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	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	98	43	22	924	652	152

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1250	418	812	0	-	0
Stage 1	736	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	165	584	810	-	-	-
Stage 1	435	-	-	-	-	-
Stage 2	565	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	158	576	805	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	420	-	-	-	-	-
Stage 2	561	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.1	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	805	-	338	-	-
HCM Lane V/C Ratio	0.027	-	0.418	-	-
HCM Control Delay (s)	9.6	-	23.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	440	30	420	20	40	40	560	330	30	30	350	360
Future Volume (veh/h)	440	30	420	20	40	40	560	330	30	30	350	360
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.97		0.98	1.00		0.98	1.00		0.98
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	478	33	403	22	43	43	609	359	33	33	380	391
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	532	571	462	278	142	142	649	2212	200	42	534	469
Arrive On Green	0.17	0.31	0.31	0.03	0.17	0.17	0.19	0.47	0.47	0.02	0.30	0.30
Sat Flow, veh/h	1774	1863	1509	1774	848	848	3442	4737	428	1774	1770	1552
Grp Volume(v), veh/h	478	33	403	22	0	86	609	255	137	33	380	391
Grp Sat Flow(s),veh/h/ln	1774	1863	1509	1774	0	1695	1721	1695	1774	1774	1770	1552
Q Serve(g_s), s	19.9	1.4	29.0	1.1	0.0	5.1	20.0	5.0	5.1	2.1	21.9	26.9
Cycle Q Clear(g_c), s	19.9	1.4	29.0	1.1	0.0	5.1	20.0	5.0	5.1	2.1	21.9	26.9
Prop In Lane	1.00		1.00	1.00		0.50	1.00		0.24	1.00		1.00
Lane Grp Cap(c), veh/h	532	571	462	278	0	284	649	1583	828	42	534	469
V/C Ratio(X)	0.90	0.06	0.87	0.08	0.00	0.30	0.94	0.16	0.17	0.79	0.71	0.83
Avail Cap(c_a), veh/h	532	590	478	501	0	515	649	1583	828	104	534	469
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	28.1	37.6	36.9	0.0	41.8	45.9	17.6	17.7	55.7	35.6	37.3
Incr Delay (d2), s/veh	18.2	0.0	15.7	0.1	0.0	0.6	21.6	0.2	0.4	27.8	7.8	15.9
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	14.9	0.7	14.0	0.6	0.0	2.4	11.4	2.4	2.6	1.4	11.8	13.6
LnGrp Delay(d),s/veh	53.0	28.1	53.3	37.0	0.0	42.4	67.5	17.8	18.1	83.5	43.4	53.3
LnGrp LOS	D	C	D	D		D	E	B	B	F	D	D
Approach Vol, veh/h		914			108			1001			804	
Approach Delay, s/veh		52.2			41.3			48.1			49.8	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.0	40.2	24.3	24.1	7.1	59.1	8.4	40.0
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	21.6	* 35	19.9	34.8	6.7	49.3	18.4	36.3
Max Q Clear Time (g_c+I1), s	22.0	28.9	21.9	7.1	4.1	7.1	3.1	31.0
Green Ext Time (p_c), s	0.0	2.2	0.0	0.4	0.0	2.4	0.0	0.8

Intersection Summary			
HCM 2010 Ctrl Delay			49.7
HCM 2010 LOS			D

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	10	140	40	10	50	60	820	20	50	900	20
Future Volume (veh/h)	40	10	140	40	10	50	60	820	20	50	900	20
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.96	1.00		0.95
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	43	11	152	43	11	54	65	891	22	54	978	22
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	58	15	206	114	18	87	83	2234	55	68	2197	49
Arrive On Green	0.17	0.17	0.17	0.06	0.06	0.06	0.05	0.44	0.44	0.04	0.43	0.43
Sat Flow, veh/h	339	87	1199	1774	275	1350	1774	5099	126	1774	5111	115
Grp Volume(v), veh/h	206	0	0	43	0	65	65	592	321	54	648	352
Grp Sat Flow(s),veh/h/ln	1624	0	0	1774	0	1625	1774	1695	1834	1774	1695	1836
Q Serve(g_s), s	8.5	0.0	0.0	1.6	0.0	2.7	2.5	8.4	8.4	2.1	9.5	9.5
Cycle Q Clear(g_c), s	8.5	0.0	0.0	1.6	0.0	2.7	2.5	8.4	8.4	2.1	9.5	9.5
Prop In Lane	0.21		0.74	1.00		0.83	1.00		0.07	1.00		0.06
Lane Grp Cap(c), veh/h	279	0	0	114	0	104	83	1485	804	68	1457	789
V/C Ratio(X)	0.74	0.00	0.00	0.38	0.00	0.62	0.78	0.40	0.40	0.79	0.44	0.45
Avail Cap(c_a), veh/h	717	0	0	808	0	740	167	1485	804	167	1457	789
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	0.0	0.0	31.5	0.0	32.0	33.1	13.4	13.4	33.5	14.1	14.1
Incr Delay (d2), s/veh	3.8	0.0	0.0	2.0	0.0	5.9	14.8	0.8	1.5	18.3	1.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	0.0	0.9	0.0	1.4	1.6	4.0	4.5	1.4	4.6	5.2
LnGrp Delay(d),s/veh	31.4	0.0	0.0	33.6	0.0	38.0	48.0	14.2	14.9	51.9	15.1	15.9
LnGrp LOS	C			C		D	D	B	B	D	B	B
Approach Vol, veh/h		206			108			978			1054	
Approach Delay, s/veh		31.4			36.2			16.7			17.3	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	36.2		9.4	7.1	36.8		17.0
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	6.6	30.2		32.0	6.6	30.2		31.0
Max Q Clear Time (g_c+I1), s	4.5	11.5		4.7	4.1	10.4		10.5
Green Ext Time (p_c), s	0.0	5.8		0.4	0.0	5.4		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.2
HCM 2010 LOS	B

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	80	10	70	700	40	10	890
Future Volume (veh/h)	80	10	70	700	40	10	890
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.96	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	87	11		761	43	11	967
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.92	0.92		0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	122	109		3014	170	20	3644
Arrive On Green	0.07	0.07		0.61	0.61	0.01	0.72
Sat Flow, veh/h	1774	1583		5082	276	1774	5253
Grp Volume(v), veh/h	87	11		524	280	11	967
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1801	1774	1695
Q Serve(g_s), s	2.3	0.3		3.5	3.5	0.3	3.3
Cycle Q Clear(g_c), s	2.3	0.3		3.5	3.5	0.3	3.3
Prop In Lane	1.00	1.00			0.15	1.00	
Lane Grp Cap(c), veh/h	122	109		2079	1104	20	3644
V/C Ratio(X)	0.71	0.10		0.25	0.25	0.55	0.27
Avail Cap(c_a), veh/h	1124	1003		2079	1104	145	3644
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.3	21.4		4.3	4.3	24.1	2.4
Incr Delay (d2), s/veh	7.5	0.4		0.3	0.6	21.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.3		1.7	1.9	0.3	1.5
LnGrp Delay(d),s/veh	29.8	21.8		4.6	4.9	45.1	2.6
LnGrp LOS	C	C		A	A	D	A
Approach Vol, veh/h	98			804			978
Approach Delay, s/veh	28.9			4.7			3.1
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.1		7.9	5.1	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		29.5		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		5.3		4.3	2.3	5.5		
Green Ext Time (p_c), s		6.6		0.2	0.0	5.0		

Intersection Summary	
HCM 2010 Ctrl Delay	5.1
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	80	110	380	90	190	100	410	740	340	860	10
Future Volume (veh/h)	50	80	110	380	90	190	100	410	740	340	860	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.97	1.00		0.99	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	54	87	120	413	98	207	109	446	804	370	935	11
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	161	366	278	510	300	249	128	1453	877	394	1602	690
Arrive On Green	0.09	0.10	0.10	0.15	0.16	0.16	0.07	0.41	0.41	0.11	0.45	0.45
Sat Flow, veh/h	1774	3539	1583	3442	1863	1542	1774	3539	1563	3442	3539	1525
Grp Volume(v), veh/h	54	87	120	413	98	207	109	446	804	370	935	11
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1542	1774	1770	1563	1721	1770	1525
Q Serve(g_s), s	2.6	2.0	6.1	10.5	4.2	11.7	5.5	7.7	36.9	9.6	17.7	0.4
Cycle Q Clear(g_c), s	2.6	2.0	6.1	10.5	4.2	11.7	5.5	7.7	36.9	9.6	17.7	0.4
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	161	366	278	510	300	249	128	1453	877	394	1602	690
V/C Ratio(X)	0.34	0.24	0.43	0.81	0.33	0.83	0.85	0.31	0.92	0.94	0.58	0.02
Avail Cap(c_a), veh/h	233	606	385	761	486	403	128	1453	877	394	1602	690
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	0.95	0.95	0.95	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	37.1	33.1	37.1	33.4	36.6	41.3	17.9	18.0	39.5	18.3	13.6
Incr Delay (d2), s/veh	1.2	0.3	1.1	4.0	0.6	7.8	37.4	0.5	15.3	30.3	1.6	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	1.3	1.0	2.8	5.3	2.2	5.5	4.0	3.8	21.5	6.2	8.9	0.2
LnGrp Delay(d),s/veh	39.6	37.4	34.1	41.1	34.0	44.4	78.6	18.4	33.3	69.9	19.9	13.6
LnGrp LOS	D	D	C	D	C	D	E	B	C	E	B	B
Approach Vol, veh/h		261			718			1359			1316	
Approach Delay, s/veh		36.4			41.1			32.1			33.9	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	42.0	18.5	14.4	11.2	45.8	13.3	19.6
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 13	24.3	* 20	15.4	* 6.5	28.1	* 12	23.5
Max Q Clear Time (g_c+I1), s	11.6	38.9	12.5	8.1	7.5	19.7	4.6	13.7
Green Ext Time (p_c), s	0.0	0.0	0.9	0.4	0.0	3.8	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	34.8
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	50	10	150	450	1100	0	0	430	600
Future Volume (veh/h)	0	0	0	50	10	150	450	1100	0	0	430	600
Number				3	8	18	5	2	12	1	6	16
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		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				54	11	163	489	1196	0	0	467	652
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
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	0	2	2
Cap, veh/h				191	39	204	450	3782	0	0	1462	654
Arrive On Green				0.13	0.13	0.13	0.51	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h				1486	303	1583	1774	5253	0	0	3558	1516
Grp Volume(v), veh/h				65	0	163	489	1196	0	0	467	652
Grp Sat Flow(s),veh/h/ln				1788	0	1583	1774	1695	0	0	1695	1516
Q Serve(g_s), s				2.6	0.0	8.0	20.3	0.0	0.0	0.0	7.3	34.3
Cycle Q Clear(g_c), s				2.6	0.0	8.0	20.3	0.0	0.0	0.0	7.3	34.3
Prop In Lane				0.83		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				230	0	204	450	3782	0	0	1462	654
V/C Ratio(X)				0.28	0.00	0.80	1.09	0.32	0.00	0.00	0.32	1.00
Avail Cap(c_a), veh/h				344	0	305	450	3782	0	0	1462	654
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	0.00	1.00	0.45	0.45	0.00	0.00	0.75	0.75
Uniform Delay (d), s/veh				31.5	0.0	33.9	19.7	0.0	0.0	0.0	15.0	22.7
Incr Delay (d2), s/veh				0.7	0.0	8.7	54.9	0.1	0.0	0.0	0.4	29.7
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				1.3	0.0	4.0	16.4	0.0	0.0	0.0	3.5	19.7
LnGrp Delay(d),s/veh				32.2	0.0	42.6	74.6	0.1	0.0	0.0	15.4	52.4
LnGrp LOS				C		D	F	A			B	D
Approach Vol, veh/h					228			1685			1119	
Approach Delay, s/veh					39.6			21.7			37.0	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		64.6			25.0	39.6		15.4
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		54.4			* 20	29.4		15.4
Max Q Clear Time (g_c+I1), s		2.0			22.3	36.3		10.0
Green Ext Time (p_c), s		10.2			0.0	0.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	28.7
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	680	10	550	0	0	0	0	900	180	110	390	0
Future Volume (veh/h)	680	10	550	0	0	0	0	900	180	110	390	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	674	102	598				0	978	196	120	424	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
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				0	2	2	2	2	0
Cap, veh/h	752	100	586				0	1299	260	149	1588	0
Arrive On Green	0.42	0.42	0.42				0.00	0.31	0.31	0.17	0.90	0.00
Sat Flow, veh/h	1774	236	1383				0	4410	848	1774	3632	0
Grp Volume(v), veh/h	674	0	700				0	781	393	120	424	0
Grp Sat Flow(s),veh/h/ln	1774	0	1619				0	1695	1700	1774	1770	0
Q Serve(g_s), s	28.2	0.0	33.9				0.0	16.6	16.7	5.2	1.3	0.0
Cycle Q Clear(g_c), s	28.2	0.0	33.9				0.0	16.6	16.7	5.2	1.3	0.0
Prop In Lane	1.00		0.85				0.00		0.50	1.00		0.00
Lane Grp Cap(c), veh/h	752	0	686				0	1038	520	149	1588	0
V/C Ratio(X)	0.90	0.00	1.02				0.00	0.75	0.76	0.81	0.27	0.00
Avail Cap(c_a), veh/h	752	0	686				0	1038	520	162	1588	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.79	0.79	0.00
Uniform Delay (d), s/veh	21.4	0.0	23.1				0.0	25.0	25.0	32.7	2.3	0.0
Incr Delay (d2), s/veh	13.5	0.0	39.6				0.0	5.0	9.8	19.4	0.3	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
%ile BackOfQ(50%),veh/ln	16.5	0.0	22.6				0.0	8.4	9.3	3.3	0.7	0.0
LnGrp Delay(d),s/veh	34.9	0.0	62.7				0.0	30.1	34.8	52.0	2.7	0.0
LnGrp LOS	C		F					C	C	D	A	
Approach Vol, veh/h		1374						1174			544	
Approach Delay, s/veh		49.1						31.7			13.5	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	11.4	29.6		39.0		41.0		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 7.3	23.9		33.9		35.9		
Max Q Clear Time (g_c+I1), s	17.2	18.7		35.9		3.3		
Green Ext Time (p_c), s	0.0	3.1		0.0		2.7		

Intersection Summary		
HCM 2010 Ctrl Delay		36.2
HCM 2010 LOS		D

Notes

LOS Engineering, Inc.

Intersection	
Intersection Delay, s/veh	124.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	440	10	20	10	30	220	40	420	10	90	350	450
Future Vol, veh/h	440	10	20	10	30	220	40	420	10	90	350	450
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	478	11	22	11	33	239	43	457	11	98	380	489
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	45.3	36.8	49.8	232
HCM LOS	E	E	E	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	87%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	93%	0%	4%	0%	100%	0%	0%	100%	21%
Vol Right, %	0%	0%	7%	0%	9%	0%	0%	100%	0%	0%	79%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	280	150	238	232	10	30	220	90	233	567
LT Vol	40	0	0	238	202	10	0	0	90	0	0
Through Vol	0	280	140	0	10	0	30	0	0	233	117
RT Vol	0	0	10	0	20	0	0	220	0	0	450
Lane Flow Rate	43	304	163	258	253	11	33	239	98	254	616
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.137	0.915	0.488	0.786	0.761	0.036	0.105	0.724	0.298	0.737	1.69
Departure Headway (Hd)	12.321	11.799	11.751	11.79	11.665	13.158	12.64	11.914	10.974	10.455	9.877
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	293	310	308	310	313	274	285	306	328	345	370
Service Time	10.021	9.499	9.451	9.49	9.365	10.858	10.34	9.614	8.748	8.229	7.651
HCM Lane V/C Ratio	0.147	0.981	0.529	0.832	0.808	0.04	0.116	0.781	0.299	0.736	1.665
HCM Control Delay	17	67.7	25.2	46.9	43.6	16.3	16.8	40.5	18.4	37.7	345.9
HCM Lane LOS	C	F	D	E	E	C	C	E	C	E	F
HCM 95th-tile Q	0.5	8.7	2.5	6.2	5.8	0.1	0.3	5.2	1.2	5.6	37.3

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1400	80	0	590	10	0	0	30	0	0	100
Future Vol, veh/h	0	1400	80	0	590	10	0	0	30	0	0	100
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	-	-	-	-	-	400	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1522	87	0	641	11	0	0	33	0	0	109

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	805	-	-	321
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	279	0	0	576
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	279	-	-	576
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	19.6	12.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	279	-	-	-	-	576
HCM Lane V/C Ratio	0.117	-	-	-	-	0.189
HCM Control Delay (s)	19.6	-	-	-	-	12.7
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0.4	-	-	-	-	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	740	120	80	380	70	190	10	50	30	20	140
Future Volume (veh/h)	400	740	120	80	380	70	190	10	50	30	20	140
Number	5	2	12	1	6	16	3	8	18	7	4	14
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		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	435	804	130	87	413	76	207	11	54	33	0	167
Adj No. of Lanes	2	3	1	1	3	1	2	1	0	1	0	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	467	1098	342	111	752	234	271	42	205	661	0	1381
Arrive On Green	0.14	0.22	0.22	0.06	0.15	0.15	0.08	0.15	0.15	0.37	0.00	0.44
Sat Flow, veh/h	3442	5085	1583	1774	5085	1580	3442	275	1350	1774	0	3127
Grp Volume(v), veh/h	435	804	130	87	413	76	207	0	65	33	0	167
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1580	1721	0	1625	1774	0	1564
Q Serve(g_s), s	12.9	15.2	7.2	5.0	7.8	4.4	6.1	0.0	3.6	1.2	0.0	3.3
Cycle Q Clear(g_c), s	12.9	15.2	7.2	5.0	7.8	4.4	6.1	0.0	3.6	1.2	0.0	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	467	1098	342	111	752	234	271	0	247	661	0	1381
V/C Ratio(X)	0.93	0.73	0.38	0.78	0.55	0.33	0.76	0.00	0.26	0.05	0.00	0.12
Avail Cap(c_a), veh/h	467	1738	541	170	1576	490	297	0	252	661	0	1381
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.2	37.7	34.6	47.7	40.8	39.4	46.6	0.0	38.7	20.7	0.0	17.0
Incr Delay (d2), s/veh	25.8	1.0	0.7	12.3	0.6	0.8	10.4	0.0	0.6	0.1	0.0	0.2
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	7.8	7.2	3.2	2.8	3.7	2.0	3.3	0.0	1.7	0.6	0.0	1.4
LnGrp Delay(d),s/veh	70.0	38.7	35.3	60.0	41.5	40.2	57.0	0.0	39.2	20.8	0.0	17.2
LnGrp LOS	E	D	D	E	D	D	E		D	C		B
Approach Vol, veh/h		1369			576			272			200	
Approach Delay, s/veh		48.3			44.1			52.8			17.8	
Approach LOS		D			D			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	29.6	12.6	50.1	18.0	22.6	42.5	20.2
Change Period (Y+Rc), s	4.5	7.3	4.5	* 4.5	4.0	* 7.3	4.0	4.5
Max Green Setting (Gmax), s	9.9	35.3	8.9	* 46	14.0	* 32	38.5	16.0
Max Q Clear Time (g_c+I1), s	7.0	17.2	8.1	5.3	14.9	9.8	3.2	5.6
Green Ext Time (p_c), s	0.0	5.1	0.1	0.6	0.0	2.7	0.1	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	45.3
HCM 2010 LOS	D

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	830	10	0	520	70	0	0	10	0	0	50
Future Vol, veh/h	0	830	10	0	520	70	0	0	10	0	0	50
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	902	11	0	565	76	0	0	11	0	0	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	457	-	-	283
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	471	0	0	609
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	471	-	-	609
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12.8	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	471	-	-	-	-	609
HCM Lane V/C Ratio	0.023	-	-	-	-	0.089
HCM Control Delay (s)	12.8	-	-	-	-	11.5
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	290	150	50	230	150	130	80	90	210	60	150
Future Volume (veh/h)	240	290	150	50	230	150	130	80	90	210	60	150
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	261	315	163	54	250	163	141	87	98	228	65	163
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	350	1071	330	115	723	225	177	286	323	270	769	1150
Arrive On Green	0.10	0.21	0.21	0.03	0.14	0.14	0.10	0.36	0.36	0.15	0.41	0.41
Sat Flow, veh/h	3442	5085	1568	3442	5085	1583	1774	795	895	1774	1863	2787
Grp Volume(v), veh/h	261	315	163	54	250	163	141	0	185	228	65	163
Grp Sat Flow(s),veh/h/ln	1721	1695	1568	1721	1695	1583	1774	0	1690	1774	1863	1393
Q Serve(g_s), s	6.4	4.6	8.0	1.3	3.9	8.6	6.8	0.0	6.9	10.9	1.9	3.2
Cycle Q Clear(g_c), s	6.4	4.6	8.0	1.3	3.9	8.6	6.8	0.0	6.9	10.9	1.9	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	350	1071	330	115	723	225	177	0	609	270	769	1150
V/C Ratio(X)	0.74	0.29	0.49	0.47	0.35	0.72	0.80	0.00	0.30	0.85	0.08	0.14
Avail Cap(c_a), veh/h	610	2385	735	177	1745	543	365	0	609	446	769	1150
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	29.0	30.4	41.5	33.8	35.9	38.5	0.0	20.1	36.1	15.6	16.0
Incr Delay (d2), s/veh	3.2	0.2	1.1	3.0	0.3	4.4	7.9	0.0	1.3	7.7	0.2	0.3
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	3.2	2.1	3.5	0.7	1.8	4.0	3.7	0.0	3.4	5.9	1.0	1.3
LnGrp Delay(d),s/veh	41.3	29.2	31.5	44.4	34.1	40.2	46.4	0.0	21.4	43.7	15.8	16.3
LnGrp LOS	D	C	C	D	C	D	D		C	D	B	B
Approach Vol, veh/h		739			467			326			456	
Approach Delay, s/veh		34.0			37.4			32.2			29.9	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	43.5	12.9	18.3	17.3	38.9	6.9	24.3
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	18.0	35.2	15.5	30.0	22.0	* 32	4.5	41.0
Max Q Clear Time (g_c+I1), s	8.8	5.2	8.4	10.6	12.9	8.9	3.3	10.0
Green Ext Time (p_c), s	0.2	0.9	0.5	1.8	0.4	1.0	0.0	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.6
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	10	30	40	10	60	20	860	50	160	670	20
Future Volume (veh/h)	20	10	30	40	10	60	20	860	50	160	670	20
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.98	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	11	32	42	11	63	21	905	53	168	705	21
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	40	21	61	57	15	86	34	1524	89	208	1919	57
Arrive On Green	0.07	0.07	0.07	0.09	0.09	0.09	0.02	0.45	0.45	0.12	0.55	0.55
Sat Flow, veh/h	552	289	842	604	158	907	1774	3393	199	1774	3506	104
Grp Volume(v), veh/h	64	0	0	116	0	0	21	472	486	168	356	370
Grp Sat Flow(s),veh/h/ln	1683	0	0	1669	0	0	1774	1770	1822	1774	1770	1841
Q Serve(g_s), s	2.7	0.0	0.0	5.1	0.0	0.0	0.9	15.0	15.0	6.9	8.5	8.5
Cycle Q Clear(g_c), s	2.7	0.0	0.0	5.1	0.0	0.0	0.9	15.0	15.0	6.9	8.5	8.5
Prop In Lane	0.33		0.50	0.36		0.54	1.00		0.11	1.00		0.06
Lane Grp Cap(c), veh/h	121	0	0	158	0	0	34	795	818	208	968	1007
V/C Ratio(X)	0.53	0.00	0.00	0.73	0.00	0.00	0.63	0.59	0.59	0.81	0.37	0.37
Avail Cap(c_a), veh/h	607	0	0	605	0	0	140	795	818	292	968	1007
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	0.0	0.0	33.0	0.0	0.0	36.4	15.5	15.5	32.2	9.6	9.6
Incr Delay (d2), s/veh	3.5	0.0	0.0	6.4	0.0	0.0	17.6	3.3	3.2	10.9	1.1	1.0
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	1.4	0.0	0.0	2.6	0.0	0.0	0.6	7.9	8.1	4.0	4.4	4.6
LnGrp Delay(d),s/veh	37.0	0.0	0.0	39.4	0.0	0.0	54.0	18.7	18.7	43.1	10.7	10.6
LnGrp LOS	D			D			D	B	B	D	B	B
Approach Vol, veh/h		64			116			979			894	
Approach Delay, s/veh		37.0			39.4			19.5			16.8	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.8	46.7		12.0	13.2	39.4		10.3
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	5.9	* 40		27.1	12.3	33.6		27.0
Max Q Clear Time (g_c+I1), s	2.9	10.5		7.1	8.9	17.0		4.7
Green Ext Time (p_c), s	0.0	4.3		0.5	0.1	5.2		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	20.0
HCM 2010 LOS	B

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	30	30	710	670	80
Future Vol, veh/h	40	30	30	710	670	80
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	32	32	747	705	84

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1201	411	797	0	-	0
Stage 1	755	-	-	-	-	-
Stage 2	446	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	177	590	821	-	-	-
Stage 1	425	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	168	582	816	-	-	-
Mov Cap-2 Maneuver	290	-	-	-	-	-
Stage 1	405	-	-	-	-	-
Stage 2	608	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.2	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	816	-	369	-	-
HCM Lane V/C Ratio	0.039	-	0.2	-	-
HCM Control Delay (s)	9.6	-	17.2	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	10	130	20	10	20	200	790	30	60	460	290
Future Volume (veh/h)	160	10	130	20	10	20	200	790	30	60	460	290
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.96		0.98	1.00		0.97	1.00		0.98
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	168	11	137	21	11	21	211	832	32	63	484	305
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	536	475	382	434	117	224	297	1958	75	80	724	454
Arrive On Green	0.10	0.25	0.25	0.05	0.21	0.21	0.09	0.39	0.39	0.05	0.35	0.35
Sat Flow, veh/h	1774	1863	1498	1774	567	1083	3442	5020	193	1774	2073	1301
Grp Volume(v), veh/h	168	11	137	21	0	32	211	561	303	63	413	376
Grp Sat Flow(s),veh/h/ln	1774	1863	1498	1774	0	1650	1721	1695	1823	1774	1770	1604
Q Serve(g_s), s	5.3	0.3	5.6	0.7	0.0	1.2	4.5	9.1	9.1	2.6	14.9	15.0
Cycle Q Clear(g_c), s	5.3	0.3	5.6	0.7	0.0	1.2	4.5	9.1	9.1	2.6	14.9	15.0
Prop In Lane	1.00		1.00	1.00		0.66	1.00		0.11	1.00		0.81
Lane Grp Cap(c), veh/h	536	475	382	434	0	341	297	1322	711	80	618	560
V/C Ratio(X)	0.31	0.02	0.36	0.05	0.00	0.09	0.71	0.42	0.43	0.78	0.67	0.67
Avail Cap(c_a), veh/h	738	893	718	721	0	791	349	1322	711	156	618	560
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	21.0	22.9	20.8	0.0	24.1	33.4	16.7	16.7	35.5	20.7	20.8
Incr Delay (d2), s/veh	0.3	0.0	0.6	0.0	0.0	0.1	5.5	1.0	1.9	15.1	5.7	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	2.6	0.2	2.4	0.3	0.0	0.5	2.4	4.4	4.9	1.6	8.2	7.6
LnGrp Delay(d),s/veh	19.3	21.0	23.5	20.9	0.0	24.2	38.8	17.7	18.6	50.6	26.4	27.1
LnGrp LOS	B	C	C	C		C	D	B	B	D	C	C
Approach Vol, veh/h		316			53			1075			852	
Approach Delay, s/veh		21.2			22.9			22.1			28.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	31.8	12.0	20.4	7.8	34.9	8.4	24.0
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	7.6	* 26	16.1	36.0	6.6	27.0	16.1	36.0
Max Q Clear Time (g_c+I1), s	6.5	17.0	7.3	3.2	4.6	11.1	2.7	7.6
Green Ext Time (p_c), s	0.1	3.2	0.3	0.1	0.0	4.6	0.0	0.5

Intersection Summary		
HCM 2010 Ctrl Delay		24.4
HCM 2010 LOS		C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	10	90	40	10	30	150	850	40	80	550	30
Future Volume (veh/h)	20	10	90	40	10	30	150	850	40	80	550	30
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.96	1.00		0.95
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	11	95	42	11	32	158	895	42	84	579	32
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	31	16	141	83	20	58	201	2419	113	109	2140	117
Arrive On Green	0.12	0.12	0.12	0.05	0.05	0.05	0.11	0.49	0.49	0.06	0.44	0.44
Sat Flow, veh/h	268	140	1212	1774	421	1225	1774	4968	233	1774	4920	270
Grp Volume(v), veh/h	127	0	0	42	0	43	158	610	327	84	398	213
Grp Sat Flow(s),veh/h/ln	1621	0	0	1774	0	1647	1774	1695	1810	1774	1695	1799
Q Serve(g_s), s	5.3	0.0	0.0	1.6	0.0	1.8	6.1	7.9	7.9	3.3	5.3	5.3
Cycle Q Clear(g_c), s	5.3	0.0	0.0	1.6	0.0	1.8	6.1	7.9	7.9	3.3	5.3	5.3
Prop In Lane	0.17		0.75	1.00		0.74	1.00		0.13	1.00		0.15
Lane Grp Cap(c), veh/h	188	0	0	83	0	77	201	1651	881	109	1475	783
V/C Ratio(X)	0.67	0.00	0.00	0.50	0.00	0.56	0.79	0.37	0.37	0.77	0.27	0.27
Avail Cap(c_a), veh/h	717	0	0	811	0	752	446	1651	881	322	1475	783
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.7	0.0	0.0	32.6	0.0	32.7	30.2	11.2	11.3	32.4	12.7	12.7
Incr Delay (d2), s/veh	4.2	0.0	0.0	4.6	0.0	6.1	6.6	0.6	1.2	10.8	0.4	0.9
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	2.6	0.0	0.0	0.9	0.0	0.9	3.4	3.8	4.2	1.9	2.5	2.8
LnGrp Delay(d),s/veh	33.8	0.0	0.0	37.2	0.0	38.7	36.9	11.9	12.5	43.2	13.1	13.5
LnGrp LOS	C			D		D	D	B	B	D	B	B
Approach Vol, veh/h		127			85			1095			695	
Approach Delay, s/veh		33.8			38.0			15.7			16.9	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.3	36.5		8.2	8.7	40.1		13.0
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	17.6	29.2		32.0	12.7	34.1		31.0
Max Q Clear Time (g_c+I1), s	8.1	7.3		3.8	5.3	9.9		7.3
Green Ext Time (p_c), s	0.3	3.5		0.3	0.1	5.9		0.6

Intersection Summary			
HCM 2010 Ctrl Delay			18.2
HCM 2010 LOS			B

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	80	10	0	1120	90	10	590
Future Volume (veh/h)	80	10	0	1120	90	10	590
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.96	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	84	11		1179	95	11	621
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.95	0.95		0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	118	105		2940	237	20	3653
Arrive On Green	0.07	0.07		0.61	0.61	0.01	0.72
Sat Flow, veh/h	1774	1583		4949	385	1774	5253
Grp Volume(v), veh/h	84	11		836	438	11	621
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1777	1774	1695
Q Serve(g_s), s	2.3	0.3		6.2	6.2	0.3	1.9
Cycle Q Clear(g_c), s	2.3	0.3		6.2	6.2	0.3	1.9
Prop In Lane	1.00	1.00			0.22	1.00	
Lane Grp Cap(c), veh/h	118	105		2084	1092	20	3653
V/C Ratio(X)	0.71	0.10		0.40	0.40	0.55	0.17
Avail Cap(c_a), veh/h	1127	1006		2084	1092	145	3653
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.3	21.4		4.8	4.8	24.0	2.2
Incr Delay (d2), s/veh	7.7	0.4		0.6	1.1	21.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.3		3.0	3.3	0.3	0.9
LnGrp Delay(d),s/veh	30.0	21.8		5.4	5.9	45.1	2.3
LnGrp LOS	C	C		A	A	D	A
Approach Vol, veh/h	95			1274			632
Approach Delay, s/veh	29.1			5.6			3.1
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.1		7.7	5.1	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		29.5		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		3.9		4.3	2.3	8.2		
Green Ext Time (p_c), s		4.0		0.2	0.0	8.4		

Intersection Summary	
HCM 2010 Ctrl Delay	5.9
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	90	80	1100	130	420	120	860	480	330	400	10
Future Volume (veh/h)	50	90	80	1100	130	420	120	860	480	330	400	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	53	95	84	1158	137	442	126	905	505	347	421	11
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	116	224	233	1199	645	538	149	1196	1080	401	1311	563
Arrive On Green	0.07	0.06	0.06	0.35	0.35	0.35	0.08	0.34	0.34	0.12	0.37	0.37
Sat Flow, veh/h	1774	3539	1583	3442	1863	1554	1774	3539	1563	3442	3539	1519
Grp Volume(v), veh/h	53	95	84	1158	137	442	126	905	505	347	421	11
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1554	1774	1770	1563	1721	1770	1519
Q Serve(g_s), s	4.3	3.9	7.2	49.6	7.8	39.0	10.5	34.1	22.5	14.9	12.7	0.7
Cycle Q Clear(g_c), s	4.3	3.9	7.2	49.6	7.8	39.0	10.5	34.1	22.5	14.9	12.7	0.7
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	116	224	233	1199	645	538	149	1196	1080	401	1311	563
V/C Ratio(X)	0.46	0.42	0.36	0.97	0.21	0.82	0.85	0.76	0.47	0.87	0.32	0.02
Avail Cap(c_a), veh/h	130	363	295	1211	710	593	222	1196	1080	521	1311	563
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	0.93	0.93	0.93	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.5	67.6	57.6	48.0	34.6	44.8	67.8	44.2	10.9	65.1	33.7	29.9
Incr Delay (d2), s/veh	2.8	1.3	0.9	18.2	0.2	8.4	16.2	4.2	1.4	11.6	0.6	0.1
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	1.9	3.2	26.5	4.0	18.0	5.8	17.4	10.0	7.7	6.4	0.3
LnGrp Delay(d),s/veh	70.3	68.9	58.5	66.2	34.7	53.1	83.9	48.4	12.3	76.7	34.4	30.0
LnGrp LOS	E	E	E	E	C	D	F	D	B	E	C	C
Approach Vol, veh/h		232			1737			1536			779	
Approach Delay, s/veh		65.5			60.4			39.4			53.2	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.2	55.8	57.4	14.6	17.3	60.7	15.0	57.1
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 23	39.0	* 53	15.4	* 19	42.9	* 11	57.2
Max Q Clear Time (g_c+I1), s	16.9	36.1	51.6	9.2	12.5	14.7	6.3	41.0
Green Ext Time (p_c), s	0.6	2.0	0.7	0.3	0.1	2.6	0.0	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	51.8
HCM 2010 LOS	D

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	90	10	210	530	1180	0	0	420	1100
Future Volume (veh/h)	0	0	0	90	10	210	530	1180	0	0	420	1100
Number				3	8	18	5	2	12	1	6	16
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		0.95
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				95	11	221	558	1242	0	0	442	1158
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
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	0	2	2
Cap, veh/h				256	30	254	544	3695	0	0	1246	553
Arrive On Green				0.16	0.16	0.16	0.31	0.73	0.00	0.00	0.37	0.37
Sat Flow, veh/h				1598	185	1583	1774	5253	0	0	3558	1505
Grp Volume(v), veh/h				106	0	221	558	1242	0	0	442	1158
Grp Sat Flow(s),veh/h/ln				1783	0	1583	1774	1695	0	0	1695	1505
Q Serve(g_s), s				4.8	0.0	12.3	27.6	8.0	0.0	0.0	8.5	33.1
Cycle Q Clear(g_c), s				4.8	0.0	12.3	27.6	8.0	0.0	0.0	8.5	33.1
Prop In Lane				0.90		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				286	0	254	544	3695	0	0	1246	553
V/C Ratio(X)				0.37	0.00	0.87	1.03	0.34	0.00	0.00	0.35	2.09
Avail Cap(c_a), veh/h				305	0	271	544	3695	0	0	1246	553
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.38	0.38	0.00	0.00	0.55	0.55
Uniform Delay (d), s/veh				33.7	0.0	36.9	31.2	4.5	0.0	0.0	20.7	28.5
Incr Delay (d2), s/veh				0.8	0.0	24.1	30.7	0.1	0.0	0.0	0.4	495.6
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				2.4	0.0	7.0	18.1	3.7	0.0	0.0	4.1	89.8
LnGrp Delay(d),s/veh				34.5	0.0	61.0	61.9	4.5	0.0	0.0	21.1	524.0
LnGrp LOS				C		E	F	A			C	F
Approach Vol, veh/h					327			1800			1600	
Approach Delay, s/veh					52.5			22.3			385.1	
Approach LOS					D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		70.5			32.3	38.2		19.5
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		64.4			* 28	32.1		15.4
Max Q Clear Time (g_c+I1), s		10.0			29.6	35.1		14.3
Green Ext Time (p_c), s		10.9			0.0	0.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	180.7
HCM 2010 LOS	F

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	670	10	500	0	0	0	0	1050	230	110	410	0
Future Volume (veh/h)	670	10	500	0	0	0	0	1050	230	110	410	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	621	129	526				0	1105	242	116	432	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
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				0	2	2	2	2	0
Cap, veh/h	730	132	539				0	1333	292	146	1632	0
Arrive On Green	0.41	0.41	0.41				0.00	0.32	0.32	0.08	0.46	0.00
Sat Flow, veh/h	1774	321	1310				0	4334	912	1774	3632	0
Grp Volume(v), veh/h	621	0	655				0	899	448	116	432	0
Grp Sat Flow(s),veh/h/ln	1774	0	1632				0	1695	1688	1774	1770	0
Q Serve(g_s), s	25.4	0.0	31.6				0.0	19.6	19.6	5.1	6.0	0.0
Cycle Q Clear(g_c), s	25.4	0.0	31.6				0.0	19.6	19.6	5.1	6.0	0.0
Prop In Lane	1.00		0.80				0.00		0.54	1.00		0.00
Lane Grp Cap(c), veh/h	730	0	671				0	1085	540	146	1632	0
V/C Ratio(X)	0.85	0.00	0.98				0.00	0.83	0.83	0.79	0.26	0.00
Avail Cap(c_a), veh/h	730	0	671				0	1085	540	162	1632	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.32	0.32	0.00
Uniform Delay (d), s/veh	21.3	0.0	23.2				0.0	25.2	25.2	36.0	13.2	0.0
Incr Delay (d2), s/veh	9.5	0.0	28.8				0.0	7.3	13.7	7.7	0.1	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
%ile BackOfQ(50%),veh/ln	14.2	0.0	19.6				0.0	10.2	11.1	2.8	2.9	0.0
LnGrp Delay(d),s/veh	30.8	0.0	51.9				0.0	32.5	38.9	43.8	13.4	0.0
LnGrp LOS	C		D					C	D	D	B	
Approach Vol, veh/h		1276						1347			548	
Approach Delay, s/veh		41.6						34.6			19.8	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	11.3	30.7		38.0		42.0		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 7.3	24.9		32.9		36.9		
Max Q Clear Time (g_c+I1), s	7.1	21.6		33.6		8.0		
Green Ext Time (p_c), s	0.0	2.3		0.0		2.7		

Intersection Summary	
HCM 2010 Ctrl Delay	34.9
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Intersection	
Intersection Delay, s/veh	90.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	390	30	40	10	20	370	20	430	10	250	400	220
Future Vol, veh/h	390	30	40	10	20	370	20	430	10	250	400	220
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	411	32	42	11	21	389	21	453	11	263	421	232
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	55.9	171.8	72.3	80.3
HCM LOS	F	F	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	70%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	93%	0%	13%	0%	100%	0%	0%	100%	38%
Vol Right, %	0%	0%	7%	0%	17%	0%	0%	100%	0%	0%	62%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	287	153	230	230	10	20	370	250	267	353
LT Vol	20	0	0	230	160	10	0	0	250	0	0
Through Vol	0	287	143	0	30	0	20	0	0	267	133
RT Vol	0	0	10	0	40	0	0	370	0	0	220
Lane Flow Rate	21	302	161	242	242	11	21	389	263	281	372
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.074	1.025	0.546	0.843	0.824	0.038	0.074	1.285	0.843	0.86	1.096
Departure Headway (Hd)	13.459	12.932	12.884	12.663	12.389	13.375	12.857	12.132	12.392	11.865	11.405
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	268	284	282	288	295	269	280	304	295	309	320
Service Time	11.159	10.632	10.584	10.363	10.089	11.075	10.557	9.832	10.092	9.565	9.105
HCM Lane V/C Ratio	0.078	1.063	0.571	0.84	0.82	0.041	0.075	1.28	0.892	0.909	1.163
HCM Control Delay	17.2	98.7	30.1	57.8	54	16.6	16.6	184.4	56.9	57.8	113.8
HCM Lane LOS	C	F	D	F	F	C	C	F	F	F	F
HCM 95th-tile Q	0.2	10.8	3	7.1	6.8	0.1	0.2	18.4	7.1	7.6	13.4

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	960	110	0	1600	40	0	0	40	0	0	70
Future Vol, veh/h	0	960	110	0	1600	40	0	0	40	0	0	70
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	250	-	250	250	-	400	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1011	116	0	1684	42	0	0	42	0	0	74

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1726	0	0	1127	0	0	-	-	506	-	-	842
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	5.34	-	-	5.34	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	172	-	-	340	-	-	0	0	438	0	0	264
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	172	-	-	340	-	-	-	-	438	-	-	264
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	14.1	23.8
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	438	172	-	-	340	-	-	264
HCM Lane V/C Ratio	0.096	-	-	-	-	-	-	0.279
HCM Control Delay (s)	14.1	0	-	-	0	-	-	23.8
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	560	160	120	1050	130	250	20	70	120	20	380
Future Volume (veh/h)	200	560	160	120	1050	130	250	20	70	120	20	380
Number	5	2	12	1	6	16	3	8	18	7	4	14
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		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	211	589	168	126	1105	137	263	21	74	126	0	414
Adj No. of Lanes	2	3	1	1	3	1	2	1	0	1	0	2
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	277	1967	612	257	1367	425	348	37	129	647	0	1140
Arrive On Green	0.08	0.39	0.39	0.27	0.27	0.27	0.10	0.10	0.10	0.36	0.00	0.36
Sat Flow, veh/h	3442	5085	1583	705	5085	1582	3442	362	1276	1774	0	3127
Grp Volume(v), veh/h	211	589	168	126	1105	137	263	0	95	126	0	414
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	705	1695	1582	1721	0	1638	1774	0	1563
Q Serve(g_s), s	6.4	8.6	7.8	17.0	21.7	7.4	8.0	0.0	5.9	5.2	0.0	10.4
Cycle Q Clear(g_c), s	6.4	8.6	7.8	17.0	21.7	7.4	8.0	0.0	5.9	5.2	0.0	10.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.78	1.00		1.00
Lane Grp Cap(c), veh/h	277	1967	612	257	1367	425	348	0	165	647	0	1140
V/C Ratio(X)	0.76	0.30	0.27	0.49	0.81	0.32	0.76	0.00	0.57	0.19	0.00	0.36
Avail Cap(c_a), veh/h	386	2268	706	278	1521	473	563	0	268	647	0	1140
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.2	22.8	22.5	34.8	36.5	31.3	46.8	0.0	45.9	23.2	0.0	24.9
Incr Delay (d2), s/veh	5.7	0.1	0.2	1.5	3.1	0.4	3.4	0.0	3.1	0.7	0.0	0.9
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	3.3	4.1	3.4	3.4	10.5	3.3	4.0	0.0	2.8	2.7	0.0	4.6
LnGrp Delay(d),s/veh	53.8	22.8	22.7	36.3	39.6	31.7	50.2	0.0	49.0	23.9	0.0	25.8
LnGrp LOS	D	C	C	D	D	C	D		D	C		C
Approach Vol, veh/h		968			1368			358			540	
Approach Delay, s/veh		29.6			38.5			49.9			25.4	
Approach LOS		C			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		48.7		43.0	12.6	36.1		15.3
Change Period (Y+Rc), s		7.3		4.0	4.0	* 7.3		4.5
Max Green Setting (Gmax), s		47.7		39.0	12.0	* 32		17.5
Max Q Clear Time (g_c+I1), s		10.6		12.4	8.4	23.7		10.0
Green Ext Time (p_c), s		4.5		2.0	0.2	5.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	34.9
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	690	10	0	940	60	0	0	10	0	0	150
Future Vol, veh/h	0	690	10	0	940	60	0	0	10	0	0	150
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	726	11	0	989	63	0	0	11	0	0	158

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	369	-	-	495
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	536	0	0	445
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	536	-	-	445
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.9	17.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	536	-	-	-	-	445
HCM Lane V/C Ratio	0.02	-	-	-	-	0.355
HCM Control Delay (s)	11.9	-	-	-	-	17.5
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	350	130	30	450	190	290	80	100	250	140	330
Future Volume (veh/h)	220	350	130	30	450	190	290	80	100	250	140	330
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	232	368	137	32	474	200	305	84	105	263	147	347
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	309	1206	372	81	869	271	347	265	332	303	615	921
Arrive On Green	0.09	0.24	0.24	0.02	0.17	0.17	0.20	0.35	0.35	0.17	0.33	0.33
Sat Flow, veh/h	3442	5085	1569	3442	5085	1583	1774	748	935	1774	1863	2787
Grp Volume(v), veh/h	232	368	137	32	474	200	305	0	189	263	147	347
Grp Sat Flow(s),veh/h/ln	1721	1695	1569	1721	1695	1583	1774	0	1682	1774	1863	1393
Q Serve(g_s), s	6.6	5.9	7.3	0.9	8.5	12.0	16.7	0.0	8.1	14.4	5.7	9.5
Cycle Q Clear(g_c), s	6.6	5.9	7.3	0.9	8.5	12.0	16.7	0.0	8.1	14.4	5.7	9.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	309	1206	372	81	869	271	347	0	597	303	615	921
V/C Ratio(X)	0.75	0.31	0.37	0.39	0.55	0.74	0.88	0.00	0.32	0.87	0.24	0.38
Avail Cap(c_a), veh/h	552	2095	647	155	1509	470	676	0	597	587	615	921
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.3	31.3	31.8	48.0	37.8	39.2	39.0	0.0	23.4	40.3	24.3	25.5
Incr Delay (d2), s/veh	3.7	0.1	0.6	3.1	0.5	3.9	7.3	0.0	1.4	7.5	0.9	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	3.3	2.8	3.2	0.5	4.0	5.5	8.8	0.0	4.0	7.7	3.1	3.8
LnGrp Delay(d),s/veh	48.0	31.4	32.4	51.1	38.3	43.2	46.3	0.0	24.8	47.7	25.2	26.7
LnGrp LOS	D	C	C	D	D	D	D		C	D	C	C
Approach Vol, veh/h		737			706			494			757	
Approach Delay, s/veh		36.8			40.3			38.0			33.7	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.5	40.4	13.0	23.0	21.0	42.8	6.4	29.6
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	38.0	30.1	16.0	29.6	33.0	* 35	4.5	41.1
Max Q Clear Time (g_c+I1), s	18.7	11.5	8.6	14.0	16.4	10.1	2.9	9.3
Green Ext Time (p_c), s	0.8	2.0	0.4	3.1	0.7	1.0	0.0	2.7

Intersection Summary		
HCM 2010 Ctrl Delay		37.1
HCM 2010 LOS		D

Notes

Appendix X

Horizon Year 2062 with Project Intersection Level of Service Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	10	22	98	10	60	23	841	62	50	617	30
Future Volume (veh/h)	70	10	22	98	10	60	23	841	62	50	617	30
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.98	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	76	11	24	107	11	65	25	914	67	54	671	33
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	122	18	38	146	15	88	40	1242	91	71	1333	66
Arrive On Green	0.10	0.10	0.10	0.15	0.15	0.15	0.02	0.37	0.37	0.04	0.39	0.39
Sat Flow, veh/h	1189	172	375	997	102	605	1774	3338	245	1774	3428	168
Grp Volume(v), veh/h	111	0	0	183	0	0	25	485	496	54	346	358
Grp Sat Flow(s),veh/h/ln	1736	0	0	1705	0	0	1774	1770	1813	1774	1770	1827
Q Serve(g_s), s	3.6	0.0	0.0	6.0	0.0	0.0	0.8	13.9	13.9	1.8	8.7	8.8
Cycle Q Clear(g_c), s	3.6	0.0	0.0	6.0	0.0	0.0	0.8	13.9	13.9	1.8	8.7	8.8
Prop In Lane	0.68		0.22	0.58		0.36	1.00		0.13	1.00		0.09
Lane Grp Cap(c), veh/h	178	0	0	249	0	0	40	658	674	71	688	711
V/C Ratio(X)	0.62	0.00	0.00	0.74	0.00	0.00	0.62	0.74	0.74	0.76	0.50	0.50
Avail Cap(c_a), veh/h	796	0	0	782	0	0	127	658	674	124	688	711
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	0.0	0.0	24.1	0.0	0.0	28.5	16.0	16.0	28.0	13.7	13.7
Incr Delay (d2), s/veh	3.5	0.0	0.0	4.2	0.0	0.0	14.4	7.2	7.0	15.5	2.6	2.5
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	1.9	0.0	0.0	3.1	0.0	0.0	0.6	8.0	8.2	1.2	4.7	4.9
LnGrp Delay(d),s/veh	28.9	0.0	0.0	28.2	0.0	0.0	42.9	23.2	23.0	43.5	16.3	16.2
LnGrp LOS	C			C			D	C	C	D	B	B
Approach Vol, veh/h		111			183			1006			758	
Approach Delay, s/veh		28.9			28.2			23.6			18.2	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	28.7		13.5	6.7	27.7		10.9
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	4.2	* 22		27.0	4.1	21.9		27.0
Max Q Clear Time (g_c+I1), s	2.8	10.8		8.0	3.8	15.9		5.6
Green Ext Time (p_c), s	0.0	3.0		0.8	0.0	2.8		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	22.3
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	90	41	22	876	617	140
Future Vol, veh/h	90	41	22	876	617	140
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	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	98	45	24	952	671	152

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1287	428	831	0	-	0
Stage 1	755	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	156	575	797	-	-	-
Stage 1	425	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	149	567	792	-	-	-
Mov Cap-2 Maneuver	276	-	-	-	-	-
Stage 1	409	-	-	-	-	-
Stage 2	549	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	792	-	329	-	-
HCM Lane V/C Ratio	0.03	-	0.433	-	-
HCM Control Delay (s)	9.7	-	24	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	2.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	440	30	432	24	40	40	578	357	36	30	368	360
Future Volume (veh/h)	440	30	432	24	40	40	578	357	36	30	368	360
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.97		0.98	1.00		0.98	1.00		0.98
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	478	33	416	26	43	43	628	388	39	33	400	391
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	532	571	462	277	142	142	649	2192	216	42	534	469
Arrive On Green	0.17	0.31	0.31	0.03	0.17	0.17	0.19	0.47	0.47	0.02	0.30	0.30
Sat Flow, veh/h	1774	1863	1509	1774	848	848	3442	4694	463	1774	1770	1552
Grp Volume(v), veh/h	478	33	416	26	0	86	628	278	149	33	400	391
Grp Sat Flow(s),veh/h/ln	1774	1863	1509	1774	0	1695	1721	1695	1767	1774	1770	1552
Q Serve(g_s), s	19.9	1.4	30.3	1.4	0.0	5.1	20.8	5.5	5.6	2.1	23.4	26.9
Cycle Q Clear(g_c), s	19.9	1.4	30.3	1.4	0.0	5.1	20.8	5.5	5.6	2.1	23.4	26.9
Prop In Lane	1.00		1.00	1.00		0.50	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	532	571	462	277	0	284	649	1583	825	42	534	469
V/C Ratio(X)	0.90	0.06	0.90	0.09	0.00	0.30	0.97	0.18	0.18	0.79	0.75	0.83
Avail Cap(c_a), veh/h	532	590	478	500	0	515	649	1583	825	104	534	469
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	28.1	38.1	37.0	0.0	41.8	46.2	17.7	17.8	55.7	36.1	37.3
Incr Delay (d2), s/veh	18.2	0.0	19.5	0.1	0.0	0.6	27.5	0.2	0.5	27.8	9.3	15.9
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	8.1	0.7	15.0	0.7	0.0	2.4	12.3	2.6	2.8	1.4	12.8	13.6
LnGrp Delay(d),s/veh	53.0	28.1	57.5	37.1	0.0	42.4	73.7	18.0	18.3	83.5	45.4	53.3
LnGrp LOS	D	C	E	D		D	E	B	B	F	D	D
Approach Vol, veh/h		927			112			1055			824	
Approach Delay, s/veh		54.2			41.2			51.2			50.6	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.0	40.2	24.3	24.1	7.1	59.1	8.4	40.0
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	21.6	* 35	19.9	34.8	6.7	49.3	18.4	36.3
Max Q Clear Time (g_c+I1), s	22.8	28.9	21.9	7.1	4.1	7.6	3.4	32.3
Green Ext Time (p_c), s	0.0	2.3	0.0	0.4	0.0	2.6	0.0	0.7

Intersection Summary		
HCM 2010 Ctrl Delay		51.6
HCM 2010 LOS		D

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	10	140	44	10	50	60	871	26	50	934	20
Future Volume (veh/h)	40	10	140	44	10	50	60	871	26	50	934	20
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.96	1.00		0.95
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	43	11	152	48	11	54	65	947	28	54	1015	22
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	58	15	206	116	18	88	83	2218	65	68	2196	48
Arrive On Green	0.17	0.17	0.17	0.07	0.07	0.07	0.05	0.44	0.44	0.04	0.43	0.43
Sat Flow, veh/h	339	87	1199	1774	275	1350	1774	5069	150	1774	5116	111
Grp Volume(v), veh/h	206	0	0	48	0	65	65	633	342	54	672	365
Grp Sat Flow(s),veh/h/ln	1624	0	0	1774	0	1625	1774	1695	1829	1774	1695	1837
Q Serve(g_s), s	8.5	0.0	0.0	1.8	0.0	2.7	2.6	9.1	9.1	2.1	9.9	9.9
Cycle Q Clear(g_c), s	8.5	0.0	0.0	1.8	0.0	2.7	2.6	9.1	9.1	2.1	9.9	9.9
Prop In Lane	0.21		0.74	1.00		0.83	1.00		0.08	1.00		0.06
Lane Grp Cap(c), veh/h	279	0	0	116	0	106	83	1484	800	68	1455	788
V/C Ratio(X)	0.74	0.00	0.00	0.41	0.00	0.61	0.78	0.43	0.43	0.79	0.46	0.46
Avail Cap(c_a), veh/h	716	0	0	807	0	739	166	1484	800	166	1455	788
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	0.0	0.0	31.6	0.0	32.0	33.2	13.7	13.7	33.6	14.3	14.3
Incr Delay (d2), s/veh	3.8	0.0	0.0	2.4	0.0	5.6	14.8	0.9	1.7	18.3	1.1	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	4.1	0.0	0.0	1.0	0.0	1.4	1.6	4.4	4.9	1.4	4.8	5.4
LnGrp Delay(d),s/veh	31.5	0.0	0.0	33.9	0.0	37.6	48.0	14.6	15.4	51.9	15.4	16.2
LnGrp LOS	C			C		D	D	B	B	D	B	B
Approach Vol, veh/h		206			113			1040			1091	
Approach Delay, s/veh		31.5			36.1			16.9			17.5	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	36.2		9.5	7.1	36.8		17.0
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	6.6	30.2		32.0	6.6	30.2		31.0
Max Q Clear Time (g_c+I1), s	4.6	11.9		4.7	4.1	11.1		10.5
Green Ext Time (p_c), s	0.0	6.0		0.4	0.0	5.7		1.0

Intersection Summary		
HCM 2010 Ctrl Delay		19.3
HCM 2010 LOS		B

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	85	10	70	757	48	10	928
Future Volume (veh/h)	85	10	70	757	48	10	928
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.96	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	92	11		823	52	11	1009
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.92	0.92		0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	129	115		2978	187	20	3629
Arrive On Green	0.07	0.07		0.61	0.61	0.01	0.71
Sat Flow, veh/h	1774	1583		5045	307	1774	5253
Grp Volume(v), veh/h	92	11		571	304	11	1009
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1794	1774	1695
Q Serve(g_s), s	2.5	0.3		3.9	3.9	0.3	3.5
Cycle Q Clear(g_c), s	2.5	0.3		3.9	3.9	0.3	3.5
Prop In Lane	1.00	1.00			0.17	1.00	
Lane Grp Cap(c), veh/h	129	115		2070	1096	20	3629
V/C Ratio(X)	0.71	0.10		0.28	0.28	0.55	0.28
Avail Cap(c_a), veh/h	1119	999		2070	1096	144	3629
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.3	21.3		4.5	4.5	24.2	2.5
Incr Delay (d2), s/veh	7.1	0.4		0.3	0.6	21.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.3		1.8	2.0	0.3	1.7
LnGrp Delay(d),s/veh	29.4	21.6		4.8	5.1	45.2	2.7
LnGrp LOS	C	C		A	A	D	A
Approach Vol, veh/h	103			875			1020
Approach Delay, s/veh	28.6			4.9			3.2
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.1		8.1	5.1	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		29.5		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		5.5		4.5	2.3	5.9		
Green Ext Time (p_c), s		6.9		0.2	0.0	5.5		

Intersection Summary		
HCM 2010 Ctrl Delay		5.2
HCM 2010 LOS		A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	88	110	426	99	269	100	410	778	405	860	10
Future Volume (veh/h)	50	88	110	426	99	269	100	410	778	405	860	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	54	96	120	463	108	292	109	446	846	440	935	11
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	161	500	338	559	397	330	128	1269	818	394	1418	610
Arrive On Green	0.09	0.14	0.14	0.16	0.21	0.21	0.07	0.36	0.36	0.11	0.40	0.40
Sat Flow, veh/h	1774	3539	1583	3442	1863	1547	1774	3539	1563	3442	3539	1521
Grp Volume(v), veh/h	54	96	120	463	108	292	109	446	846	440	935	11
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1547	1774	1770	1563	1721	1770	1521
Q Serve(g_s), s	2.6	2.2	5.8	11.7	4.4	16.5	5.5	8.3	32.3	10.3	19.4	0.4
Cycle Q Clear(g_c), s	2.6	2.2	5.8	11.7	4.4	16.5	5.5	8.3	32.3	10.3	19.4	0.4
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	161	500	338	559	397	330	128	1269	818	394	1418	610
V/C Ratio(X)	0.34	0.19	0.36	0.83	0.27	0.89	0.85	0.35	1.03	1.12	0.66	0.02
Avail Cap(c_a), veh/h	233	606	385	761	486	404	128	1269	818	394	1418	610
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	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	34.1	30.1	36.5	29.6	34.3	41.3	21.2	21.6	39.8	22.0	16.3
Incr Delay (d2), s/veh	1.2	0.2	0.6	5.6	0.4	17.7	37.3	0.7	39.8	81.0	2.4	0.1
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	1.3	1.1	2.6	6.0	2.3	8.7	4.0	4.2	29.1	9.3	10.0	0.2
LnGrp Delay(d),s/veh	39.6	34.3	30.8	42.0	29.9	52.0	78.5	21.9	61.5	120.9	24.4	16.3
LnGrp LOS	D	C	C	D	C	D	E	C	F	F	C	B
Approach Vol, veh/h		270			863			1401			1386	
Approach Delay, s/veh		33.8			43.9			50.2			55.0	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	37.4	19.8	17.8	11.2	41.2	13.3	24.3
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 10	24.3	* 20	15.4	* 6.5	28.1	* 12	23.5
Max Q Clear Time (g_c+I1), s	12.3	34.3	13.7	7.8	7.5	21.4	4.6	18.5
Green Ext Time (p_c), s	0.0	0.0	0.9	0.5	0.0	3.2	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	49.4
HCM 2010 LOS	D

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	50	10	155	450	1120	0	0	445	623
Future Volume (veh/h)	0	0	0	50	10	155	450	1120	0	0	445	623
Number				3	8	18	5	2	12	1	6	16
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		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				54	11	168	489	1217	0	0	484	677
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
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	0	2	2
Cap, veh/h				196	40	209	450	3767	0	0	1452	649
Arrive On Green				0.13	0.13	0.13	0.51	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h				1486	303	1583	1774	5253	0	0	3558	1516
Grp Volume(v), veh/h				65	0	168	489	1217	0	0	484	677
Grp Sat Flow(s),veh/h/ln				1788	0	1583	1774	1695	0	0	1695	1516
Q Serve(g_s), s				2.6	0.0	8.2	20.3	0.0	0.0	0.0	7.6	34.3
Cycle Q Clear(g_c), s				2.6	0.0	8.2	20.3	0.0	0.0	0.0	7.6	34.3
Prop In Lane				0.83		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				236	0	209	450	3767	0	0	1452	649
V/C Ratio(X)				0.28	0.00	0.81	1.09	0.32	0.00	0.00	0.33	1.04
Avail Cap(c_a), veh/h				344	0	305	450	3767	0	0	1452	649
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	0.00	1.00	0.42	0.42	0.00	0.00	0.72	0.72
Uniform Delay (d), s/veh				31.3	0.0	33.7	19.7	0.0	0.0	0.0	15.3	22.9
Incr Delay (d2), s/veh				0.6	0.0	9.5	54.1	0.1	0.0	0.0	0.4	41.8
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				1.3	0.0	4.1	16.3	0.0	0.0	0.0	3.7	21.8
LnGrp Delay(d),s/veh				31.9	0.0	43.3	73.8	0.1	0.0	0.0	15.7	64.7
LnGrp LOS				C		D	F	A			B	F
Approach Vol, veh/h					233			1706			1161	
Approach Delay, s/veh					40.1			21.2			44.3	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		64.4			25.0	39.4		15.6
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		54.4			* 20	29.4		15.4
Max Q Clear Time (g_c+I1), s		2.0			22.3	36.3		10.2
Green Ext Time (p_c), s		10.5			0.0	0.0		0.4

Intersection Summary		
HCM 2010 Ctrl Delay		31.3
HCM 2010 LOS		C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	695	10	550	0	0	0	0	905	180	118	398	0
Future Volume (veh/h)	695	10	550	0	0	0	0	905	180	118	398	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	682	113	598				0	984	196	128	433	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
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				0	2	2	2	2	0
Cap, veh/h	752	109	578				0	1279	254	158	1588	0
Arrive On Green	0.42	0.42	0.42				0.00	0.30	0.30	0.18	0.90	0.00
Sat Flow, veh/h	1774	258	1364				0	4415	844	1774	3632	0
Grp Volume(v), veh/h	682	0	711				0	785	395	128	433	0
Grp Sat Flow(s),veh/h/ln	1774	0	1622				0	1695	1701	1774	1770	0
Q Serve(g_s), s	28.8	0.0	33.9				0.0	16.8	16.9	5.5	1.3	0.0
Cycle Q Clear(g_c), s	28.8	0.0	33.9				0.0	16.8	16.9	5.5	1.3	0.0
Prop In Lane	1.00		0.84				0.00		0.50	1.00		0.00
Lane Grp Cap(c), veh/h	752	0	687				0	1021	512	158	1588	0
V/C Ratio(X)	0.91	0.00	1.03				0.00	0.77	0.77	0.81	0.27	0.00
Avail Cap(c_a), veh/h	752	0	687				0	1021	512	162	1588	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.77	0.77	0.00
Uniform Delay (d), s/veh	21.6	0.0	23.1				0.0	25.4	25.4	32.3	2.3	0.0
Incr Delay (d2), s/veh	14.8	0.0	43.5				0.0	5.6	10.7	20.5	0.3	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
%ile BackOfQ(50%),veh/ln	17.1	0.0	23.4				0.0	8.6	9.4	3.6	0.7	0.0
LnGrp Delay(d),s/veh	36.4	0.0	66.6				0.0	31.0	36.2	52.7	2.7	0.0
LnGrp LOS	D		F					C	D	D	A	
Approach Vol, veh/h		1393						1180			561	
Approach Delay, s/veh		51.8						32.7			14.1	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	11.8	29.2		39.0		41.0		
Change Period (Y+Rc), s	* 4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	* 7.3	23.9		33.9		35.9		
Max Q Clear Time (g_c+I1), s	7.5	18.9		35.9		3.3		
Green Ext Time (p_c), s	0.0	3.0		0.0		2.7		

Intersection Summary		
HCM 2010 Ctrl Delay		37.9
HCM 2010 LOS		D

Notes

LOS Engineering, Inc.

Intersection	
Intersection Delay, s/veh	128.3
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	444	10	20	10	30	221	40	420	10	92	350	456
Future Vol, veh/h	444	10	20	10	30	221	40	420	10	92	350	456
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	483	11	22	11	33	240	43	457	11	100	380	496
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	46.4	37.5	50.4	238.8
HCM LOS	E	E	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	87%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	93%	0%	4%	0%	100%	0%	0%	100%	20%
Vol Right, %	0%	0%	7%	0%	9%	0%	0%	100%	0%	0%	80%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	280	150	240	234	10	30	221	92	233	573
LT Vol	40	0	0	240	204	10	0	0	92	0	0
Through Vol	0	280	140	0	10	0	30	0	0	233	117
RT Vol	0	0	10	0	20	0	0	221	0	0	456
Lane Flow Rate	43	304	163	261	255	11	33	240	100	254	622
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.137	0.918	0.49	0.795	0.768	0.037	0.105	0.73	0.306	0.739	1.713
Departure Headway (Hd)	12.391	11.869	11.821	11.84	11.716	13.219	12.7	11.974	11.008	10.488	9.909
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	291	307	307	308	311	273	284	305	326	345	367
Service Time	10.091	9.569	9.521	9.54	9.416	10.919	10.4	9.674	8.785	8.265	7.686
HCM Lane V/C Ratio	0.148	0.99	0.531	0.847	0.82	0.04	0.116	0.787	0.307	0.736	1.695
HCM Control Delay	17	68.5	25.4	48.2	44.5	16.4	16.9	41.2	18.6	38	356
HCM Lane LOS	C	F	D	E	E	C	C	E	C	E	F
HCM 95th-tile Q	0.5	8.8	2.5	6.4	6	0.1	0.3	5.3	1.3	5.6	38.2

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1305	106	0	0	0	92
Future Vol, veh/h	1305	106	0	0	0	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	-	-	-	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	1418	115	0	0	0	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	709
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	323
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	323
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	21.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	323	-	-	-
HCM Lane V/C Ratio	0.31	-	-	-
HCM Control Delay (s)	21.1	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	1.3	-	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	74	1418	85	38	590	10	61	4	58	0	3	100
Future Vol, veh/h	74	1418	85	38	590	10	61	4	58	0	3	100
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	-	-	-	-	-	400	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	80	1541	92	41	641	11	66	4	63	0	3	109

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	652	0	0	1633	0	0	2087	2481	817	1501	2516	321
Stage 1	-	-	-	-	-	-	1747	1747	-	723	723	-
Stage 2	-	-	-	-	-	-	340	734	-	778	1793	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	574	-	-	191	-	-	~ 56	29	274	129	28	576
Stage 1	-	-	-	-	-	-	~ 59	138	-	309	429	-
Stage 2	-	-	-	-	-	-	594	424	-	323	131	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	574	-	-	191	-	-	-	0	274	-	0	576
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-	-	0	-
Stage 1	-	-	-	-	-	-	~ 59	0	-	309	284	-
Stage 2	-	-	-	-	-	-	316	281	-	-	0	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1.7		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	274	574	-	-	191	-	-	-
HCM Lane V/C Ratio	-	0.246	0.14	-	-	0.216	-	-	-
HCM Control Delay (s)	-	22.4	12.3	-	-	29	-	-	-
HCM Lane LOS	-	C	B	-	-	D	-	-	-
HCM 95th %tile Q(veh)	-	0.9	0.5	-	-	0.8	-	-	-

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)	408	770	120	80	400	70	190	10	50	30	20	145
Future Volume (veh/h)	408	770	120	80	400	70	190	10	50	30	20	145
Number	5	2	12	1	6	16	3	8	18	7	4	14
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		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	443	837	130	87	435	76	207	11	54	33	0	173
Adj No. of Lanes	2	3	1	1	3	1	2	1	0	1	0	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	462	1131	352	111	791	246	270	42	204	655	0	1367
Arrive On Green	0.13	0.22	0.22	0.06	0.16	0.16	0.08	0.15	0.15	0.37	0.00	0.44
Sat Flow, veh/h	3442	5085	1583	1774	5085	1580	3442	275	1350	1774	0	3127
Grp Volume(v), veh/h	443	837	130	87	435	76	207	0	65	33	0	173
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1580	1721	0	1625	1774	0	1564
Q Serve(g_s), s	13.3	16.0	7.3	5.0	8.2	4.5	6.2	0.0	3.7	1.2	0.0	3.4
Cycle Q Clear(g_c), s	13.3	16.0	7.3	5.0	8.2	4.5	6.2	0.0	3.7	1.2	0.0	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	462	1131	352	111	791	246	270	0	246	655	0	1367
V/C Ratio(X)	0.96	0.74	0.37	0.79	0.55	0.31	0.77	0.00	0.26	0.05	0.00	0.13
Avail Cap(c_a), veh/h	462	1721	536	168	1560	485	294	0	249	655	0	1367
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.9	37.7	34.3	48.2	40.7	39.1	47.1	0.0	39.1	21.1	0.0	17.5
Incr Delay (d2), s/veh	31.5	1.0	0.6	12.7	0.6	0.7	10.7	0.0	0.6	0.1	0.0	0.2
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	8.4	7.5	3.2	2.9	3.9	2.0	3.3	0.0	1.7	0.6	0.0	1.5
LnGrp Delay(d),s/veh	76.3	38.7	35.0	60.9	41.3	39.8	57.8	0.0	39.7	21.3	0.0	17.7
LnGrp LOS	E	D	C	E	D	D	E		D	C		B
Approach Vol, veh/h		1410			598			272			206	
Approach Delay, s/veh		50.2			43.9			53.5			18.3	
Approach LOS		D			D			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	30.5	12.7	50.1	18.0	23.5	42.5	20.3
Change Period (Y+Rc), s	4.5	7.3	4.5	* 4.5	4.0	* 7.3	4.0	4.5
Max Green Setting (Gmax), s	9.9	35.3	8.9	* 46	14.0	* 32	38.5	16.0
Max Q Clear Time (g_c+I1), s	7.0	18.0	8.2	5.4	15.3	10.2	3.2	5.7
Green Ext Time (p_c), s	0.0	5.2	0.0	0.7	0.0	2.8	0.1	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	46.4
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	860	10	0	540	70	0	0	10	0	0	50
Future Vol, veh/h	0	860	10	0	540	70	0	0	10	0	0	50
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	935	11	0	587	76	0	0	11	0	0	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	473	-	-	294
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	460	0	0	599
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	460	-	-	599
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13	11.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	460	-	-	-	-	599
HCM Lane V/C Ratio	0.024	-	-	-	-	0.091
HCM Control Delay (s)	13	-	-	-	-	11.6
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	305	155	50	240	150	133	80	90	210	60	157
Future Volume (veh/h)	250	305	155	50	240	150	133	80	90	210	60	157
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	272	332	168	54	261	163	145	87	98	228	65	171
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.92	0.92	0.92	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	2	2	2	2	2	2	2
Cap, veh/h	361	1089	336	115	725	226	181	285	321	269	760	1137
Arrive On Green	0.10	0.21	0.21	0.03	0.14	0.14	0.10	0.36	0.36	0.15	0.41	0.41
Sat Flow, veh/h	3442	5085	1568	3442	5085	1583	1774	795	895	1774	1863	2787
Grp Volume(v), veh/h	272	332	168	54	261	163	145	0	185	228	65	171
Grp Sat Flow(s),veh/h/ln	1721	1695	1568	1721	1695	1583	1774	0	1690	1774	1863	1393
Q Serve(g_s), s	6.8	4.8	8.3	1.4	4.1	8.7	7.0	0.0	6.9	11.0	1.9	3.4
Cycle Q Clear(g_c), s	6.8	4.8	8.3	1.4	4.1	8.7	7.0	0.0	6.9	11.0	1.9	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	361	1089	336	115	725	226	181	0	605	269	760	1137
V/C Ratio(X)	0.75	0.30	0.50	0.47	0.36	0.72	0.80	0.00	0.31	0.85	0.09	0.15
Avail Cap(c_a), veh/h	607	2371	731	176	1735	540	363	0	605	444	760	1137
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	29.0	30.4	41.7	34.1	36.0	38.6	0.0	20.3	36.3	16.0	16.4
Incr Delay (d2), s/veh	3.2	0.2	1.2	3.0	0.3	4.3	7.9	0.0	1.3	7.8	0.2	0.3
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	3.4	2.3	3.7	0.7	1.9	4.0	3.8	0.0	3.5	6.0	1.0	1.4
LnGrp Delay(d),s/veh	41.4	29.2	31.6	44.7	34.4	40.3	46.5	0.0	21.6	44.1	16.2	16.7
LnGrp LOS	D	C	C	D	C	D	D		C	D	B	B
Approach Vol, veh/h		772			478			330			464	
Approach Delay, s/veh		34.0			37.6			32.6			30.1	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	43.3	13.2	18.4	17.4	38.9	6.9	24.7
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	18.0	35.2	15.5	30.0	22.0	* 32	4.5	41.0
Max Q Clear Time (g_c+I1), s	9.0	5.4	8.8	10.7	13.0	8.9	3.4	10.3
Green Ext Time (p_c), s	0.2	1.0	0.5	1.9	0.4	1.0	0.0	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	33.7
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	10	35	62	10	60	24	875	67	160	689	20
Future Volume (veh/h)	20	10	35	62	10	60	24	875	67	160	689	20
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.98	1.00		0.97
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	11	37	65	11	63	25	921	71	168	725	21
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	37	20	66	87	15	85	38	1457	112	207	1873	54
Arrive On Green	0.07	0.07	0.07	0.11	0.11	0.11	0.02	0.44	0.44	0.12	0.53	0.53
Sat Flow, veh/h	510	267	898	788	133	764	1774	3324	256	1774	3509	102
Grp Volume(v), veh/h	69	0	0	139	0	0	25	490	502	168	365	381
Grp Sat Flow(s),veh/h/ln	1675	0	0	1686	0	0	1774	1770	1811	1774	1770	1841
Q Serve(g_s), s	3.1	0.0	0.0	6.1	0.0	0.0	1.1	16.5	16.5	7.1	9.3	9.3
Cycle Q Clear(g_c), s	3.1	0.0	0.0	6.1	0.0	0.0	1.1	16.5	16.5	7.1	9.3	9.3
Prop In Lane	0.30		0.54	0.47		0.45	1.00		0.14	1.00		0.06
Lane Grp Cap(c), veh/h	123	0	0	186	0	0	38	776	794	207	944	983
V/C Ratio(X)	0.56	0.00	0.00	0.75	0.00	0.00	0.65	0.63	0.63	0.81	0.39	0.39
Avail Cap(c_a), veh/h	590	0	0	596	0	0	137	776	794	285	944	983
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	0.0	0.0	33.0	0.0	0.0	37.2	16.7	16.7	33.0	10.5	10.5
Incr Delay (d2), s/veh	4.0	0.0	0.0	5.8	0.0	0.0	17.3	3.9	3.8	11.7	1.2	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	1.6	0.0	0.0	3.2	0.0	0.0	0.7	8.9	9.1	4.1	4.8	5.0
LnGrp Delay(d),s/veh	38.3	0.0	0.0	38.9	0.0	0.0	54.5	20.6	20.5	44.8	11.7	11.7
LnGrp LOS	D			D			D	C	C	D	B	B
Approach Vol, veh/h		69			139			1017			914	
Approach Delay, s/veh		38.3			38.9			21.4			17.8	
Approach LOS		D			D			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	46.7		13.4	13.3	39.4		10.5				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	5.9	* 40		27.1	12.3	33.6		27.0				
Max Q Clear Time (g_c+I1), s	3.1	11.3		8.1	9.1	18.5		5.1				
Green Ext Time (p_c), s	0.0	4.4		0.6	0.1	5.2		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			21.5									
HCM 2010 LOS			C									
Notes												

LOS Engineering, Inc.

Intersection						
Int Delay, s/veh	1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	33	32	747	716	80
Future Vol, veh/h	40	33	32	747	716	80
Conflicting Peds, #/hr	8	8	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	225	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	35	34	786	754	84

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1273	435	846	0	-	0
Stage 1	804	-	-	-	-	-
Stage 2	469	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	159	569	787	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	596	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	150	561	782	-	-	-
Mov Cap-2 Maneuver	272	-	-	-	-	-
Stage 1	381	-	-	-	-	-
Stage 2	592	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.9	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	782	-	355	-	-
HCM Lane V/C Ratio	0.043	-	0.216	-	-
HCM Control Delay (s)	9.8	-	17.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	10	163	31	10	20	226	829	39	60	509	290
Future Volume (veh/h)	160	10	163	31	10	20	226	829	39	60	509	290
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.96		0.98	1.00		0.97	1.00		0.98
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	168	11	172	33	11	21	238	873	41	63	536	305
Adj No. of Lanes	1	1	1	1	1	0	2	3	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	534	474	381	425	117	223	322	1957	92	80	746	424
Arrive On Green	0.10	0.25	0.25	0.05	0.21	0.21	0.09	0.39	0.39	0.05	0.35	0.35
Sat Flow, veh/h	1774	1863	1498	1774	567	1083	3442	4972	233	1774	2161	1227
Grp Volume(v), veh/h	168	11	172	33	0	32	238	595	319	63	439	402
Grp Sat Flow(s),veh/h/ln	1774	1863	1498	1774	0	1650	1721	1695	1814	1774	1770	1619
Q Serve(g_s), s	5.4	0.3	7.3	1.1	0.0	1.2	5.1	9.8	9.8	2.7	16.4	16.4
Cycle Q Clear(g_c), s	5.4	0.3	7.3	1.1	0.0	1.2	5.1	9.8	9.8	2.7	16.4	16.4
Prop In Lane	1.00		1.00	1.00		0.66	1.00		0.13	1.00		0.76
Lane Grp Cap(c), veh/h	534	474	381	425	0	340	322	1334	714	80	611	559
V/C Ratio(X)	0.31	0.02	0.45	0.08	0.00	0.09	0.74	0.45	0.45	0.78	0.72	0.72
Avail Cap(c_a), veh/h	732	884	711	708	0	783	345	1334	714	154	611	559
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	21.2	23.8	21.3	0.0	24.4	33.5	16.9	16.9	35.8	21.6	21.6
Incr Delay (d2), s/veh	0.3	0.0	0.8	0.1	0.0	0.1	7.6	1.1	2.0	15.1	7.1	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.2	3.1	0.5	0.0	0.6	2.8	4.7	5.3	1.6	9.1	8.5
LnGrp Delay(d),s/veh	19.6	21.2	24.7	21.3	0.0	24.5	41.1	18.0	19.0	50.9	28.7	29.4
LnGrp LOS	B	C	C	C		C	D	B	B	D	C	C
Approach Vol, veh/h		351			65			1152			904	
Approach Delay, s/veh		22.1			22.9			23.0			30.6	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	31.8	12.0	20.5	7.8	35.5	8.4	24.2
Change Period (Y+Rc), s	4.4	* 5.6	4.4	4.9	4.4	5.6	4.4	4.9
Max Green Setting (Gmax), s	7.6	* 26	16.1	36.0	6.6	27.0	16.1	36.0
Max Q Clear Time (g_c+I1), s	7.1	18.4	7.4	3.2	4.7	11.8	3.1	9.3
Green Ext Time (p_c), s	0.0	3.0	0.3	0.1	0.0	4.8	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	10	90	51	10	30	150	923	49	80	642	30
Future Volume (veh/h)	20	10	90	51	10	30	150	923	49	80	642	30
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.96	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	11	95	54	11	32	158	972	52	84	676	32
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	30	16	136	89	21	62	166	2745	147	108	2600	122
Arrive On Green	0.11	0.11	0.11	0.05	0.05	0.05	0.09	0.56	0.56	0.06	0.52	0.52
Sat Flow, veh/h	268	140	1212	1774	421	1225	1774	4931	263	1774	4966	234
Grp Volume(v), veh/h	127	0	0	54	0	43	158	668	356	84	460	248
Grp Sat Flow(s),veh/h/ln	1620	0	0	1774	0	1647	1774	1695	1804	1774	1695	1809
Q Serve(g_s), s	6.9	0.0	0.0	2.7	0.0	2.3	8.1	10.0	10.0	4.3	6.9	6.9
Cycle Q Clear(g_c), s	6.9	0.0	0.0	2.7	0.0	2.3	8.1	10.0	10.0	4.3	6.9	6.9
Prop In Lane	0.17		0.75	1.00		0.74	1.00		0.15	1.00		0.13
Lane Grp Cap(c), veh/h	181	0	0	89	0	83	166	1887	1004	108	1775	947
V/C Ratio(X)	0.70	0.00	0.00	0.60	0.00	0.52	0.95	0.35	0.35	0.78	0.26	0.26
Avail Cap(c_a), veh/h	550	0	0	621	0	577	166	1887	1004	186	1775	947
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	0.0	0.0	42.6	0.0	42.4	41.3	11.2	11.2	42.4	12.0	12.1
Incr Delay (d2), s/veh	4.9	0.0	0.0	6.4	0.0	4.9	54.8	0.5	1.0	11.4	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	3.3	0.0	0.0	1.5	0.0	1.2	6.5	4.8	5.2	2.4	3.3	3.6
LnGrp Delay(d),s/veh	44.1	0.0	0.0	49.0	0.0	47.4	96.1	11.7	12.2	53.8	12.4	12.7
LnGrp LOS	D			D		D	F	B	B	D	B	B
Approach Vol, veh/h		127			97			1182			792	
Approach Delay, s/veh		44.1			48.3			23.2			16.9	
Approach LOS		D			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	54.0		9.5	10.0	57.0		15.2
Change Period (Y+Rc), s	4.4	6.0		4.9	4.4	6.0		4.9
Max Green Setting (Gmax), s	8.6	48.0		32.1	9.6	47.0		31.1
Max Q Clear Time (g_c+I1), s	10.1	8.9		4.7	6.3	12.0		8.9
Green Ext Time (p_c), s	0.0	4.6		0.3	0.0	7.2		0.6

Intersection Summary		
HCM 2010 Ctrl Delay		23.2
HCM 2010 LOS		C

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	94	10	40	1202	101	10	693
Future Volume (veh/h)	94	10	40	1202	101	10	693
Number	7	14		6	16	5	2
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			0.96	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863		1863	1900	1863	1863
Adj Flow Rate, veh/h	99	11		1265	106	11	729
Adj No. of Lanes	1	1		3	0	1	3
Peak Hour Factor	0.95	0.95		0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	139	124		2892	242	20	3608
Arrive On Green	0.08	0.08		0.61	0.61	0.01	0.71
Sat Flow, veh/h	1774	1583		4932	399	1774	5253
Grp Volume(v), veh/h	99	11		900	471	11	729
Grp Sat Flow(s),veh/h/ln	1774	1583		1695	1773	1774	1695
Q Serve(g_s), s	2.7	0.3		7.0	7.0	0.3	2.4
Cycle Q Clear(g_c), s	2.7	0.3		7.0	7.0	0.3	2.4
Prop In Lane	1.00	1.00			0.23	1.00	
Lane Grp Cap(c), veh/h	139	124		2058	1077	20	3608
V/C Ratio(X)	0.71	0.09		0.44	0.44	0.55	0.20
Avail Cap(c_a), veh/h	1113	993		2058	1077	144	3608
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.2	21.1		5.2	5.2	24.3	2.4
Incr Delay (d2), s/veh	6.7	0.3		0.7	1.3	21.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.3		3.4	3.8	0.3	1.1
LnGrp Delay(d),s/veh	28.9	21.5		5.9	6.5	45.4	2.6
LnGrp LOS	C	C		A	A	D	A
Approach Vol, veh/h	110			1371			740
Approach Delay, s/veh	28.2			6.1			3.2
Approach LOS	C			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.1		8.4	5.1	36.0		
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0		
Max Green Setting (Gmax), s		29.5		31.0	4.0	30.0		
Max Q Clear Time (g_c+I1), s		4.4		4.7	2.3	9.0		
Green Ext Time (p_c), s		4.8		0.3	0.0	9.0		

Intersection Summary	
HCM 2010 Ctrl Delay	6.2
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	109	80	1183	147	562	120	860	577	496	400	10
Future Volume (veh/h)	50	109	80	1183	147	562	120	860	577	496	400	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	53	115	84	1245	155	592	126	905	607	522	421	11
Adj No. of Lanes	1	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	116	335	283	1211	710	593	149	949	976	521	1188	508
Arrive On Green	0.07	0.09	0.09	0.35	0.38	0.38	0.08	0.27	0.27	0.15	0.34	0.34
Sat Flow, veh/h	1774	3539	1583	3442	1863	1555	1774	3539	1563	3442	3539	1515
Grp Volume(v), veh/h	53	115	84	1245	155	592	126	905	607	522	421	11
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1863	1555	1774	1770	1563	1721	1770	1515
Q Serve(g_s), s	4.3	4.6	6.9	52.8	8.4	57.1	10.5	37.7	36.2	22.7	13.5	0.7
Cycle Q Clear(g_c), s	4.3	4.6	6.9	52.8	8.4	57.1	10.5	37.7	36.2	22.7	13.5	0.7
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	116	335	283	1211	710	593	149	949	976	521	1188	508
V/C Ratio(X)	0.46	0.34	0.30	1.03	0.22	1.00	0.85	0.95	0.62	1.00	0.35	0.02
Avail Cap(c_a), veh/h	130	363	295	1211	710	593	222	949	976	521	1188	508
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	0.92	0.92	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.5	63.5	53.5	48.6	31.3	46.4	67.8	54.0	17.7	63.7	37.6	33.4
Incr Delay (d2), s/veh	2.8	0.6	0.6	33.2	0.2	36.5	16.0	18.9	2.7	40.0	0.8	0.1
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	2.3	3.1	30.7	4.4	30.5	5.8	21.0	16.3	13.7	6.7	0.3
LnGrp Delay(d),s/veh	70.3	64.2	54.0	81.8	31.5	82.9	83.8	72.9	20.4	103.6	38.4	33.4
LnGrp LOS	E	E	D	F	C	F	F	E	C	F	D	C
Approach Vol, veh/h		252			1992			1638			954	
Approach Delay, s/veh		62.1			78.2			54.3			74.0	
Approach LOS		E			E			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.4	45.3	58.0	19.3	17.3	55.4	15.0	62.3
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 23	39.0	* 53	15.4	* 19	42.9	* 11	57.2
Max Q Clear Time (g_c+I1), s	24.7	39.7	54.8	8.9	12.5	15.5	6.3	59.1
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4	0.1	2.6	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	68.4
HCM 2010 LOS	E

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	90	10	224	530	1234	0	0	442	1132
Future Volume (veh/h)	0	0	0	90	10	224	530	1234	0	0	442	1132
Number				3	8	18	5	2	12	1	6	16
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		0.95
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				95	11	236	558	1299	0	0	465	1192
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
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	0	2	2
Cap, veh/h				269	31	267	544	3653	0	0	1219	540
Arrive On Green				0.17	0.17	0.17	0.31	0.72	0.00	0.00	0.36	0.36
Sat Flow, veh/h				1598	185	1583	1774	5253	0	0	3558	1503
Grp Volume(v), veh/h				106	0	236	558	1299	0	0	465	1192
Grp Sat Flow(s),veh/h/ln				1783	0	1583	1774	1695	0	0	1695	1503
Q Serve(g_s), s				4.7	0.0	13.1	27.6	8.7	0.0	0.0	9.2	32.3
Cycle Q Clear(g_c), s				4.7	0.0	13.1	27.6	8.7	0.0	0.0	9.2	32.3
Prop In Lane				0.90		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				300	0	267	544	3653	0	0	1219	540
V/C Ratio(X)				0.35	0.00	0.89	1.03	0.36	0.00	0.00	0.38	2.21
Avail Cap(c_a), veh/h				305	0	271	544	3653	0	0	1219	540
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.32	0.32	0.00	0.00	0.45	0.45
Uniform Delay (d), s/veh				33.1	0.0	36.6	31.2	4.8	0.0	0.0	21.4	28.8
Incr Delay (d2), s/veh				0.7	0.0	27.2	28.5	0.1	0.0	0.0	0.4	545.9
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				2.4	0.0	7.7	17.8	4.0	0.0	0.0	4.3	95.3
LnGrp Delay(d),s/veh				33.8	0.0	63.8	59.7	4.9	0.0	0.0	21.8	574.7
LnGrp LOS				C		E	F	A			C	F
Approach Vol, veh/h					342			1857			1657	
Approach Delay, s/veh					54.5			21.3			419.5	
Approach LOS					D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		69.7			32.3	37.4		20.3
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		64.4			* 28	32.1		15.4
Max Q Clear Time (g_c+I1), s		10.7			29.6	34.3		15.1
Green Ext Time (p_c), s		11.7			0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	195.4
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	711	10	500	0	0	0	0	1064	230	121	421	0
Future Volume (veh/h)	711	10	500	0	0	0	0	1064	230	121	421	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	642	159	526				0	1120	242	127	443	0
Adj No. of Lanes	1	1	0				0	3	0	1	2	0
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				0	2	2	2	2	0
Cap, veh/h	730	157	518				0	1307	282	159	1632	0
Arrive On Green	0.41	0.41	0.41				0.00	0.31	0.31	0.09	0.46	0.00
Sat Flow, veh/h	1774	381	1260				0	4345	902	1774	3632	0
Grp Volume(v), veh/h	642	0	685				0	909	453	127	443	0
Grp Sat Flow(s),veh/h/ln	1774	0	1640				0	1695	1690	1774	1770	0
Q Serve(g_s), s	26.7	0.0	32.9				0.0	20.1	20.1	5.6	6.2	0.0
Cycle Q Clear(g_c), s	26.7	0.0	32.9				0.0	20.1	20.1	5.6	6.2	0.0
Prop In Lane	1.00		0.77				0.00		0.53	1.00		0.00
Lane Grp Cap(c), veh/h	730	0	675				0	1061	529	159	1632	0
V/C Ratio(X)	0.88	0.00	1.02				0.00	0.86	0.86	0.80	0.27	0.00
Avail Cap(c_a), veh/h	730	0	675				0	1061	529	162	1632	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.26	0.26	0.00
Uniform Delay (d), s/veh	21.7	0.0	23.6				0.0	25.8	25.8	35.7	13.3	0.0
Incr Delay (d2), s/veh	12.0	0.0	38.5				0.0	8.9	16.3	7.1	0.1	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
%ile BackOfQ(50%),veh/ln	15.5	0.0	22.0				0.0	10.7	11.7	3.1	3.0	0.0
LnGrp Delay(d),s/veh	33.7	0.0	62.1				0.0	34.7	42.1	42.8	13.4	0.0
LnGrp LOS	C		F					C	D	D	B	
Approach Vol, veh/h		1327						1362			570	
Approach Delay, s/veh		48.4						37.2			19.9	
Approach LOS		D						D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	11.9	30.1		38.0		42.0		
Change Period (Y+Rc), s	4.7	5.1		5.1		5.1		
Max Green Setting (Gmax), s	7.3	24.9		32.9		36.9		
Max Q Clear Time (g_c+I1), s	7.6	22.1		34.9		8.2		
Green Ext Time (p_c), s	0.0	2.0		0.0		2.7		

Intersection Summary		
HCM 2010 Ctrl Delay		38.7
HCM 2010 LOS		D

Notes

Intersection	
Intersection Delay, s/veh	93.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	401	30	40	10	20	373	20	430	10	252	400	229
Future Vol, veh/h	401	30	40	10	20	373	20	430	10	252	400	229
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	422	32	42	11	21	393	21	453	11	265	421	241
Number of Lanes	1	1	0	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	59.1	175.8	73.7	85
HCM LOS	F	F	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	70%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	93%	0%	13%	0%	100%	0%	0%	100%	37%
Vol Right, %	0%	0%	7%	0%	17%	0%	0%	100%	0%	0%	63%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	287	153	237	234	10	20	373	252	267	362
LT Vol	20	0	0	237	164	10	0	0	252	0	0
Through Vol	0	287	143	0	30	0	20	0	0	267	133
RT Vol	0	0	10	0	40	0	0	373	0	0	229
Lane Flow Rate	21	302	161	249	247	11	21	393	265	281	381
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.075	1.031	0.549	0.865	0.839	0.038	0.074	1.295	0.85	0.861	1.124
Departure Headway (Hd)	13.559	13.032	12.984	12.718	12.449	13.452	12.934	12.209	12.459	11.932	11.465
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	266	281	279	286	294	268	279	302	292	306	320
Service Time	11.259	10.732	10.684	10.418	10.149	11.152	10.634	9.909	10.159	9.632	9.165
HCM Lane V/C Ratio	0.079	1.075	0.577	0.871	0.84	0.041	0.075	1.301	0.908	0.918	1.191
HCM Control Delay	17.4	100.8	30.4	61.7	56.5	16.7	16.7	188.6	58.3	58.2	123.2
HCM Lane LOS	C	F	D	F	F	C	C	F	F	F	F
HCM 95th-tile Q	0.2	10.9	3.1	7.5	7.1	0.1	0.2	18.6	7.3	7.6	14.2

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1072	271	0	0	0	165
Future Vol, veh/h	1072	271	0	0	0	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1128	285	0	0	0	174

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	564
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	402
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	402
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	20.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	402	-	-	-
HCM Lane V/C Ratio	0.432	-	-	-
HCM Control Delay (s)	20.6	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	2.1	-	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	132	993	122	96	1600	40	208	11	89	20	12	70
Future Vol, veh/h	132	993	122	96	1600	40	208	11	89	20	12	70
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	250	-	250	250	-	400	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	139	1045	128	101	1684	42	219	12	94	21	13	74

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1726	0	0	1173	0	0	2205	3251	523	2588	3337	842
Stage 1	-	-	-	-	-	-	1323	1323	-	1886	1886	-
Stage 2	-	-	-	-	-	-	882	1928	-	702	1451	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	172	-	-	323	-	-	~ 47	~ 9	427	27	~ 8	264
Stage 1	-	-	-	-	-	-	~ 118	224	-	47	118	-
Stage 2	-	-	-	-	-	-	278	112	-	359	194	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	172	-	-	323	-	-	-	~ 1	427	-	~ 1	264
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 1	-	-	~ 1	-
Stage 1	-	-	-	-	-	-	~ 23	43	-	~ 9	81	-
Stage 2	-	-	-	-	-	-	~ 116	77	-	39	37	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	1.2		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	9	172	-	-	323	-	-	-
HCM Lane V/C Ratio	-	11.696	0.808	-	-	0.313	-	-	-
HCM Control Delay (s)		$ 5621.7	80	-	-	21.1	-	-	-
HCM Lane LOS	-	F	F	-	-	C	-	-	-
HCM 95th %tile Q(veh)	-	14.7	5.4	-	-	1.3	-	-	-

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)	211	603	160	120	1104	130	250	20	70	120	20	394
Future Volume (veh/h)	211	603	160	120	1104	130	250	20	70	120	20	394
Number	5	2	12	1	6	16	3	8	18	7	4	14
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		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	222	635	168	126	1162	137	263	21	74	126	0	429
Adj No. of Lanes	2	3	1	1	3	1	2	1	0	1	0	2
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	222	2029	632	267	1512	470	343	36	127	631	0	1112
Arrive On Green	0.06	0.40	0.40	0.30	0.30	0.30	0.10	0.10	0.10	0.36	0.00	0.36
Sat Flow, veh/h	3442	5085	1583	675	5085	1582	3442	362	1276	1774	0	3127
Grp Volume(v), veh/h	222	635	168	126	1162	137	263	0	95	126	0	429
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	675	1695	1582	1721	0	1638	1774	0	1563
Q Serve(g_s), s	7.0	9.3	7.7	17.5	22.5	7.2	8.1	0.0	6.0	5.3	0.0	11.1
Cycle Q Clear(g_c), s	7.0	9.3	7.7	17.5	22.5	7.2	8.1	0.0	6.0	5.3	0.0	11.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.78	1.00		1.00
Lane Grp Cap(c), veh/h	222	2029	632	267	1512	470	343	0	163	631	0	1112
V/C Ratio(X)	1.00	0.31	0.27	0.47	0.77	0.29	0.77	0.00	0.58	0.20	0.00	0.39
Avail Cap(c_a), veh/h	222	2334	727	310	1831	570	508	0	242	631	0	1112
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.6	22.4	21.9	32.9	34.6	29.3	47.5	0.0	46.6	24.2	0.0	26.1
Incr Delay (d2), s/veh	59.7	0.1	0.2	1.3	1.7	0.3	4.0	0.0	3.3	0.7	0.0	1.0
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	5.1	4.4	3.4	3.4	10.8	3.2	4.0	0.0	2.9	2.7	0.0	4.9
LnGrp Delay(d),s/veh	110.3	22.4	22.1	34.2	36.3	29.6	51.6	0.0	49.9	24.9	0.0	27.1
LnGrp LOS	F	C	C	C	D	C	D		D	C		C
Approach Vol, veh/h		1025			1425			358			555	
Approach Delay, s/veh		41.4			35.5			51.1			26.6	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		50.5		42.5	11.0	39.5		15.3
Change Period (Y+Rc), s		7.3		4.0	4.0	* 7.3		4.5
Max Green Setting (Gmax), s		49.7		38.5	7.0	* 39		16.0
Max Q Clear Time (g_c+I1), s		11.3		13.1	9.0	24.5		10.1
Green Ext Time (p_c), s		4.8		2.1	0.0	7.7		0.7

Intersection Summary		
HCM 2010 Ctrl Delay		37.5
HCM 2010 LOS		D

Notes

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Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	733	10	0	994	60	0	0	10	0	0	150
Future Vol, veh/h	0	733	10	0	994	60	0	0	10	0	0	150
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	-	-	-	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	772	11	0	1046	63	0	0	11	0	0	158

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	392	-	-	523
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	519	0	0	427
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	519	-	-	427
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12.1	18.3
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	519	-	-	-	-	427
HCM Lane V/C Ratio	0.02	-	-	-	-	0.37
HCM Control Delay (s)	12.1	-	-	-	-	18.3
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	372	136	30	477	190	298	80	100	250	140	349
Future Volume (veh/h)	235	372	136	30	477	190	298	80	100	250	140	349
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	247	392	143	32	502	200	314	84	105	263	147	367
Adj No. of Lanes	2	3	1	2	3	1	1	1	0	1	1	2
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	324	1233	381	81	874	272	355	263	329	303	600	898
Arrive On Green	0.09	0.24	0.24	0.02	0.17	0.17	0.20	0.35	0.35	0.17	0.32	0.32
Sat Flow, veh/h	3442	5085	1570	3442	5085	1583	1774	748	935	1774	1863	2787
Grp Volume(v), veh/h	247	392	143	32	502	200	314	0	189	263	147	367
Grp Sat Flow(s),veh/h/ln	1721	1695	1570	1721	1695	1583	1774	0	1682	1774	1863	1393
Q Serve(g_s), s	7.0	6.4	7.6	0.9	9.1	12.1	17.3	0.0	8.3	14.5	5.8	10.3
Cycle Q Clear(g_c), s	7.0	6.4	7.6	0.9	9.1	12.1	17.3	0.0	8.3	14.5	5.8	10.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	324	1233	381	81	874	272	355	0	592	303	600	898
V/C Ratio(X)	0.76	0.32	0.38	0.40	0.57	0.73	0.88	0.00	0.32	0.87	0.24	0.41
Avail Cap(c_a), veh/h	547	2077	641	154	1496	466	670	0	592	582	600	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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	31.3	31.8	48.4	38.3	39.5	39.1	0.0	23.8	40.6	25.1	26.6
Incr Delay (d2), s/veh	3.7	0.1	0.6	3.1	0.6	3.8	7.3	0.0	1.4	7.5	1.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	3.0	3.4	0.5	4.3	5.5	9.2	0.0	4.1	7.7	3.2	4.2
LnGrp Delay(d),s/veh	48.2	31.4	32.4	51.5	38.9	43.3	46.4	0.0	25.2	48.2	26.1	28.0
LnGrp LOS	D	C	C	D	D	D	D		C	D	C	C
Approach Vol, veh/h		782			734			503			777	
Approach Delay, s/veh		36.9			40.7			38.5			34.5	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.2	39.8	13.5	23.2	21.2	42.8	6.4	30.3
Change Period (Y+Rc), s	4.0	7.4	4.0	5.9	4.0	* 7.4	4.0	5.9
Max Green Setting (Gmax), s	38.0	30.1	16.0	29.6	33.0	* 35	4.5	41.1
Max Q Clear Time (g_c+I1), s	19.3	12.3	9.0	14.1	16.5	10.3	2.9	9.6
Green Ext Time (p_c), s	0.8	2.1	0.4	3.2	0.7	1.0	0.0	2.9

Intersection Summary		
HCM 2010 Ctrl Delay		37.5
HCM 2010 LOS		D

Notes

Appendix Y

Horizon Year 2062 with Project Intersection LOS Calculations with Mitigation and Concept Striping

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	88	110	426	99	269	100	410	778	405	860	10
Future Volume (veh/h)	50	88	110	426	99	269	100	410	778	405	860	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.97	1.00		0.99	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	53	93	116	448	238	194	105	432	819	426	905	11
Adj No. of Lanes	1	2	1	3	1	1	1	2	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	169	414	304	732	297	245	133	1285	785	452	1484	638
Arrive On Green	0.10	0.12	0.12	0.14	0.16	0.16	0.08	0.36	0.36	0.13	0.42	0.42
Sat Flow, veh/h	1774	3539	1583	5322	1863	1542	1774	3539	1563	3442	3539	1523
Grp Volume(v), veh/h	53	93	116	448	238	194	105	432	819	426	905	11
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1542	1774	1770	1563	1721	1770	1523
Q Serve(g_s), s	2.2	1.9	5.1	6.3	9.9	9.7	4.7	7.1	29.0	9.8	16.0	0.3
Cycle Q Clear(g_c), s	2.2	1.9	5.1	6.3	9.9	9.7	4.7	7.1	29.0	9.8	16.0	0.3
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	169	414	304	732	297	245	133	1285	785	452	1484	638
V/C Ratio(X)	0.31	0.22	0.38	0.61	0.80	0.79	0.79	0.34	1.04	0.94	0.61	0.02
Avail Cap(c_a), veh/h	244	681	424	838	396	328	146	1285	785	452	1484	638
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	0.95	0.95	0.95	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	32.0	28.2	32.5	32.4	32.3	36.4	18.5	20.0	34.5	18.1	13.6
Incr Delay (d2), s/veh	1.1	0.3	0.8	1.0	8.4	9.1	21.7	0.7	43.1	28.5	1.9	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	1.1	0.9	2.3	3.2	5.8	4.7	3.1	3.5	26.6	6.5	8.2	0.2
LnGrp Delay(d),s/veh	34.8	32.3	29.0	33.5	40.9	41.4	58.1	19.2	63.1	62.9	20.0	13.6
LnGrp LOS	C	C	C	C	D	D	E	B	F	E	C	B
Approach Vol, veh/h		262			880			1356			1342	
Approach Delay, s/veh		31.3			37.3			48.7			33.6	
Approach LOS		C			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.2	34.1	16.2	14.5	10.7	38.6	12.8	17.8
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 11	21.4	* 13	15.4	* 6.6	25.3	* 11	17.0
Max Q Clear Time (g_c+I1), s	11.8	31.0	8.3	7.1	6.7	18.0	4.2	11.9
Green Ext Time (p_c), s	0.0	0.0	0.7	0.5	0.0	3.3	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	39.6
HCM 2010 LOS	D

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	50	10	155	450	1120	0	0	445	623
Future Volume (veh/h)	0	0	0	50	10	155	450	1120	0	0	445	623
Number				3	8	18	5	2	12	1	6	16
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		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				53	11	163	474	1179	0	0	468	656
Adj No. of Lanes				0	1	1	1	3	0	0	3	1
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	0	2	2
Cap, veh/h				186	39	199	510	3871	0	0	2143	638
Arrive On Green				0.13	0.13	0.13	0.29	0.76	0.00	0.00	0.42	0.42
Sat Flow, veh/h				1481	307	1583	1774	5253	0	0	5253	1515
Grp Volume(v), veh/h				64	0	163	474	1179	0	0	468	656
Grp Sat Flow(s),veh/h/ln				1789	0	1583	1774	1695	0	0	1695	1515
Q Serve(g_s), s				2.9	0.0	9.0	23.4	6.5	0.0	0.0	5.3	37.9
Cycle Q Clear(g_c), s				2.9	0.0	9.0	23.4	6.5	0.0	0.0	5.3	37.9
Prop In Lane				0.83		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				225	0	199	510	3871	0	0	2143	638
V/C Ratio(X)				0.29	0.00	0.82	0.93	0.30	0.00	0.00	0.22	1.03
Avail Cap(c_a), veh/h				306	0	271	558	3871	0	0	2143	638
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.49	0.49	0.00	0.00	0.76	0.76
Uniform Delay (d), s/veh				35.7	0.0	38.4	31.2	3.3	0.0	0.0	16.6	26.0
Incr Delay (d2), s/veh				0.7	0.0	13.3	12.4	0.1	0.0	0.0	0.2	38.4
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				1.5	0.0	4.7	13.2	3.0	0.0	0.0	2.5	22.6
LnGrp Delay(d),s/veh				36.4	0.0	51.7	43.6	3.4	0.0	0.0	16.8	64.4
LnGrp LOS				D		D	D	A			B	F
Approach Vol, veh/h					227			1653			1124	
Approach Delay, s/veh					47.4			15.0			44.6	
Approach LOS					D			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		73.6			30.6	43.0		16.4
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		64.4			* 28	31.4		15.4
Max Q Clear Time (g_c+I1), s		8.5			25.4	39.9		11.0
Green Ext Time (p_c), s		10.1			0.5	0.0		0.3

Intersection Summary		
HCM 2010 Ctrl Delay		28.5
HCM 2010 LOS		C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	444	10	20	10	30	221	40	420	10	92	350	456
Future Volume (veh/h)	444	10	20	10	30	221	40	420	10	92	350	456
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.87	1.00		0.88
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	494	0	0	11	32	233	42	442	11	97	368	480
Adj No. of Lanes	2	1	0	2	1	2	2	3	0	2	2	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	712	374	0	431	233	341	106	2003	49	164	727	572
Arrive On Green	0.20	0.00	0.00	0.13	0.13	0.13	0.03	0.39	0.39	0.05	0.41	0.41
Sat Flow, veh/h	3548	1863	0	3442	1863	2720	3442	5084	126	3442	1770	1392
Grp Volume(v), veh/h	494	0	0	11	32	233	42	294	159	97	368	480
Grp Sat Flow(s),veh/h/ln	1774	1863	0	1721	1863	1360	1721	1695	1819	1721	1770	1392
Q Serve(g_s), s	10.0	0.0	0.0	0.2	1.2	6.3	0.9	4.5	4.5	2.1	12.0	24.0
Cycle Q Clear(g_c), s	10.0	0.0	0.0	0.2	1.2	6.3	0.9	4.5	4.5	2.1	12.0	24.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	712	374	0	431	233	341	106	1336	717	164	727	572
V/C Ratio(X)	0.69	0.00	0.00	0.03	0.14	0.68	0.40	0.22	0.22	0.59	0.51	0.84
Avail Cap(c_a), veh/h	1443	757	0	733	397	579	200	2031	1090	338	1131	889
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	0.0	0.0	29.7	30.2	32.4	36.8	15.6	15.6	36.2	17.0	20.5
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.0	0.3	2.4	2.4	0.1	0.2	3.4	0.5	4.3
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	5.0	0.0	0.0	0.1	0.6	2.5	0.5	2.1	2.3	1.1	5.9	9.9
LnGrp Delay(d),s/veh	30.0	0.0	0.0	29.8	30.4	34.8	39.2	15.7	15.7	39.6	17.5	24.8
LnGrp LOS	C			C	C	C	D	B	B	D	B	C
Approach Vol, veh/h		494			276			495			945	
Approach Delay, s/veh		30.0			34.1			17.7			23.5	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.2	35.0		20.1	6.9	36.3		14.2
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.6	46.4		31.5	4.5	49.5		16.5
Max Q Clear Time (g_c+I1), s	4.1	6.5		12.0	2.9	26.0		8.3
Green Ext Time (p_c), s	0.1	2.7		1.6	0.0	5.8		0.7

Intersection Summary		
HCM 2010 Ctrl Delay		25.0
HCM 2010 LOS		C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	1418	85	38	590	10	61	4	58	35	3	100
Future Volume (veh/h)	74	1418	85	38	590	10	61	4	58	35	3	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	78	1493	89	40	621	11	64	4	61	37	3	105
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	100	2237	697	59	2119	660	142	8	120	53	4	151
Arrive On Green	0.06	0.44	0.44	0.03	0.42	0.42	0.08	0.08	0.08	0.13	0.13	0.13
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	98	1500	417	34	1183
Grp Volume(v), veh/h	78	1493	89	40	621	11	64	0	65	145	0	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	0	1598	1633	0	0
Q Serve(g_s), s	2.4	13.1	1.9	1.3	4.6	0.2	1.9	0.0	2.2	4.8	0.0	0.0
Cycle Q Clear(g_c), s	2.4	13.1	1.9	1.3	4.6	0.2	1.9	0.0	2.2	4.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.94	0.26		0.72
Lane Grp Cap(c), veh/h	100	2237	697	59	2119	660	142	0	128	209	0	0
V/C Ratio(X)	0.78	0.67	0.13	0.68	0.29	0.02	0.45	0.00	0.51	0.69	0.00	0.00
Avail Cap(c_a), veh/h	299	3018	940	173	2658	827	534	0	481	463	0	0
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	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.3	12.5	9.4	27.0	10.9	9.7	24.8	0.0	24.9	23.6	0.0	0.0
Incr Delay (d2), s/veh	12.3	0.3	0.1	13.1	0.1	0.0	2.2	0.0	3.1	4.1	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	1.5	6.2	0.8	0.8	2.1	0.1	1.0	0.0	1.1	2.4	0.0	0.0
LnGrp Delay(d),s/veh	38.6	12.9	9.5	40.1	11.0	9.7	27.0	0.0	28.0	27.7	0.0	0.0
LnGrp LOS	D	B	A	D	B	A	C		C	C		
Approach Vol, veh/h		1660			672			129			145	
Approach Delay, s/veh		13.9			12.7			27.5			27.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.0	6.4	29.3		11.7	7.7	28.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		17.0	5.5	33.5		16.0	9.5	29.5
Max Q Clear Time (g_c+I1), s		4.2	3.3	15.1		6.8	4.4	6.6
Green Ext Time (p_c), s		0.3	0.0	9.7		0.4	0.1	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	15.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	109	80	1183	147	562	120	860	577	496	400	10
Future Volume (veh/h)	50	109	80	1183	147	562	120	860	577	496	400	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.99	1.00		0.96
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	53	115	84	1245	483	374	126	905	607	522	421	11
Adj No. of Lanes	1	2	1	3	1	1	1	2	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	142	389	312	1333	522	434	155	1061	865	541	1309	562
Arrive On Green	0.08	0.11	0.11	0.25	0.28	0.28	0.09	0.30	0.30	0.16	0.37	0.37
Sat Flow, veh/h	1774	3539	1583	5322	1863	1551	1774	3539	1563	3442	3539	1519
Grp Volume(v), veh/h	53	115	84	1245	483	374	126	905	607	522	421	11
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1551	1774	1770	1563	1721	1770	1519
Q Serve(g_s), s	3.1	3.3	4.9	25.2	27.7	25.2	7.7	26.5	31.4	16.6	9.4	0.5
Cycle Q Clear(g_c), s	3.1	3.3	4.9	25.2	27.7	25.2	7.7	26.5	31.4	16.6	9.4	0.5
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	142	389	312	1333	522	434	155	1061	865	541	1309	562
V/C Ratio(X)	0.37	0.30	0.27	0.93	0.93	0.86	0.81	0.85	0.70	0.96	0.32	0.02
Avail Cap(c_a), veh/h	177	495	360	1345	545	454	248	1061	865	541	1309	562
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	0.92	0.92	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	45.1	37.5	40.3	38.5	37.6	49.3	36.2	18.2	46.0	24.8	22.0
Incr Delay (d2), s/veh	1.6	0.4	0.5	12.0	21.5	15.0	9.6	8.1	4.3	29.8	0.7	0.1
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	1.6	1.6	2.2	13.8	17.3	12.5	4.2	14.1	14.4	10.1	4.7	0.2
LnGrp Delay(d),s/veh	49.6	45.5	37.9	52.4	60.0	52.5	58.9	44.3	22.5	75.8	25.4	22.1
LnGrp LOS	D	D	D	D	E	D	E	D	C	E	C	C
Approach Vol, veh/h		252			2102			1638			954	
Approach Delay, s/veh		43.8			54.1			37.3			53.0	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	38.1	32.7	17.2	14.3	45.8	14.0	35.9
Change Period (Y+Rc), s	* 4.7	5.1	* 5.2	5.1	* 4.7	5.1	* 5.2	5.1
Max Green Setting (Gmax), s	* 17	29.4	* 28	15.4	* 15	31.3	* 11	32.2
Max Q Clear Time (g_c+I1), s	18.6	33.4	27.2	6.9	9.7	11.4	5.1	29.7
Green Ext Time (p_c), s	0.0	0.0	0.4	0.5	0.1	2.4	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	47.8
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	90	10	224	530	1234	0	0	442	1132
Future Volume (veh/h)	0	0	0	90	10	224	530	1234	0	0	442	1132
Number				3	8	18	5	2	12	1	6	16
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		0.95
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				95	11	236	558	1299	0	0	465	1192
Adj No. of Lanes				0	1	1	1	3	0	0	3	1
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	0	2	2
Cap, veh/h				269	31	267	499	3653	0	0	1958	581
Arrive On Green				0.17	0.17	0.17	0.28	0.72	0.00	0.00	0.38	0.38
Sat Flow, veh/h				1598	185	1583	1774	5253	0	0	5253	1508
Grp Volume(v), veh/h				106	0	236	558	1299	0	0	465	1192
Grp Sat Flow(s),veh/h/ln				1783	0	1583	1774	1695	0	0	1695	1508
Q Serve(g_s), s				4.7	0.0	13.1	25.3	8.7	0.0	0.0	5.6	34.6
Cycle Q Clear(g_c), s				4.7	0.0	13.1	25.3	8.7	0.0	0.0	5.6	34.6
Prop In Lane				0.90		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				300	0	267	499	3653	0	0	1958	581
V/C Ratio(X)				0.35	0.00	0.89	1.12	0.36	0.00	0.00	0.24	2.05
Avail Cap(c_a), veh/h				305	0	271	499	3653	0	0	1958	581
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.32	0.32	0.00	0.00	0.51	0.51
Uniform Delay (d), s/veh				33.1	0.0	36.6	32.3	4.8	0.0	0.0	18.7	27.7
Incr Delay (d2), s/veh				0.7	0.0	27.2	62.6	0.1	0.0	0.0	0.1	477.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.4	0.0	7.7	21.0	4.0	0.0	0.0	2.6	91.3
LnGrp Delay(d),s/veh				33.8	0.0	63.8	95.0	4.9	0.0	0.0	18.9	504.7
LnGrp LOS				C		E	F	A			B	F
Approach Vol, veh/h					342			1857			1657	
Approach Delay, s/veh					54.5			32.0			368.3	
Approach LOS					D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		69.7			30.0	39.7		20.3
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1
Max Green Setting (Gmax), s		64.4			* 25	34.4		15.4
Max Q Clear Time (g_c+I1), s		10.7			27.3	36.6		15.1
Green Ext Time (p_c), s		11.7			0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	178.5
HCM 2010 LOS	F

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	401	30	40	10	20	373	20	430	10	252	400	229
Future Volume (veh/h)	401	30	40	10	20	373	20	430	10	252	400	229
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98	1.00		0.79	1.00		0.85
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	484	0	0	11	21	393	21	453	11	265	421	241
Adj No. of Lanes	2	1	0	2	1	2	2	3	0	2	2	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	777	408	0	631	341	502	66	1164	28	358	641	359
Arrive On Green	0.22	0.00	0.00	0.18	0.18	0.18	0.02	0.23	0.23	0.10	0.31	0.31
Sat Flow, veh/h	3548	1863	0	3442	1863	2741	3442	5072	122	3442	2041	1144
Grp Volume(v), veh/h	484	0	0	11	21	393	21	301	163	265	364	298
Grp Sat Flow(s),veh/h/ln	1774	1863	0	1721	1863	1371	1721	1695	1804	1721	1770	1415
Q Serve(g_s), s	8.4	0.0	0.0	0.2	0.6	9.3	0.4	5.1	5.2	5.1	12.1	12.5
Cycle Q Clear(g_c), s	8.4	0.0	0.0	0.2	0.6	9.3	0.4	5.1	5.2	5.1	12.1	12.5
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.07	1.00		0.81
Lane Grp Cap(c), veh/h	777	408	0	631	341	502	66	778	414	358	556	445
V/C Ratio(X)	0.62	0.00	0.00	0.02	0.06	0.78	0.32	0.39	0.39	0.74	0.65	0.67
Avail Cap(c_a), veh/h	834	438	0	834	451	664	202	846	450	379	556	445
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.1	0.0	0.0	22.8	23.0	26.5	32.9	22.2	22.2	29.6	20.2	20.3
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.0	0.1	4.4	2.7	0.3	0.6	7.1	2.8	3.9
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	4.2	0.0	0.0	0.1	0.3	3.8	0.2	2.4	2.6	2.8	6.3	5.3
LnGrp Delay(d),s/veh	25.4	0.0	0.0	22.8	23.0	30.9	35.6	22.5	22.8	36.7	22.9	24.2
LnGrp LOS	C			C	C	C	D	C	C	D	C	C
Approach Vol, veh/h		484			425			485			927	
Approach Delay, s/veh		25.4			30.3			23.2			27.3	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.6	20.1		19.4	5.8	25.9		17.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.5	17.0		16.0	4.0	20.5		16.5
Max Q Clear Time (g_c+I1), s	7.1	7.2		10.4	2.4	14.5		11.3
Green Ext Time (p_c), s	0.0	1.8		0.9	0.0	2.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	26.6
HCM 2010 LOS	C

Notes

LOS Engineering, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	993	122	96	1600	40	208	11	89	20	12	70
Future Volume (veh/h)	132	993	122	96	1600	40	208	11	89	20	12	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	139	1045	128	101	1684	42	219	12	94	21	13	74
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	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	2	2	2	2	2	2	2
Cap, veh/h	174	2167	675	131	2041	636	276	28	222	30	19	107
Arrive On Green	0.10	0.43	0.43	0.07	0.40	0.40	0.16	0.16	0.16	0.10	0.10	0.10
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	182	1428	320	198	1129
Grp Volume(v), veh/h	139	1045	128	101	1684	42	219	0	106	108	0	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	0	1611	1648	0	0
Q Serve(g_s), s	5.5	10.7	3.6	4.0	21.4	1.2	8.6	0.0	4.3	4.6	0.0	0.0
Cycle Q Clear(g_c), s	5.5	10.7	3.6	4.0	21.4	1.2	8.6	0.0	4.3	4.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.89	0.19		0.69
Lane Grp Cap(c), veh/h	174	2167	675	131	2041	636	276	0	250	157	0	0
V/C Ratio(X)	0.80	0.48	0.19	0.77	0.83	0.07	0.79	0.00	0.42	0.69	0.00	0.00
Avail Cap(c_a), veh/h	209	2167	675	288	2174	677	411	0	373	366	0	0
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	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.8	14.9	12.9	32.8	19.3	13.3	29.3	0.0	27.5	31.6	0.0	0.0
Incr Delay (d2), s/veh	16.3	0.2	0.1	9.3	2.6	0.0	6.3	0.0	1.1	5.3	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	3.5	5.0	1.6	2.3	10.5	0.5	4.7	0.0	2.0	2.3	0.0	0.0
LnGrp Delay(d),s/veh	48.0	15.1	13.0	42.1	21.9	13.3	35.7	0.0	28.7	36.9	0.0	0.0
LnGrp LOS	D	B	B	D	C	B	D		C	D		
Approach Vol, veh/h		1312			1827			325			108	
Approach Delay, s/veh		18.4			22.8			33.4			36.9	
Approach LOS		B			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		15.7	9.8	35.2		11.4	11.6	33.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		16.7	11.7	27.6		16.0	8.5	30.8
Max Q Clear Time (g_c+I1), s		10.6	6.0	12.7		6.6	7.5	23.4
Green Ext Time (p_c), s		0.6	0.1	6.1		0.3	0.0	5.6

Intersection Summary	
HCM 2010 Ctrl Delay	22.6
HCM 2010 LOS	C

Existing Conditions (Caliente Ave/Otay Mesa Rd/Ocean View Hills Pkwy)

Proposed Conditions (Caliente Ave/Otay Mesa Rd/Ocean View Hills Pkwy)

Appendix Z

Fair Share Calculations

Fair Share Calculations

7) Caliente/SR905 WB Ramp

A=	1883	Existing number of vehicles entering the intersection (AM)
B=	2790	Horizon Year without Project number of vehicles entering the intersection (AM)
C=	2853	Horizon Year with Project number of vehicles entering the intersection (AM)

AM Percent of Fair-Share (C-B)/(C-A) = **6.5%**

A=	2272	Existing number of vehicles entering the intersection (PM)
B=	3540	Horizon Year without Project number of vehicles entering the intersection (PM)
C=	3662	Horizon Year with Project number of vehicles entering the intersection (PM)

PM Percent of Fair-Share (C-B)/(C-A) = **8.8%**

Waste Management Plan for the California Terraces Planning Area 61 Project San Diego, California

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RECON Number 4135.1
September 14, 2018

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TABLE OF CONTENTS

FIGURES

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TABLES

ATTACHMENTS

Acronyms and Abbreviations

AB	Assembly Bill
C&D	Construction and Demolition
CalRecycle	State of California Department of Resources Recycling and Recovery
City	City of San Diego
du	dwelling unit
ESD	Environmental Services Department
PA	Planning Area
project	California Terraces Planning Area 61
sf	square foot
SR-905	State Route 905
SWMC	Solid Waste Management Coordinator
U.S. EPA	U.S. Environmental Protection Agency
WMP	Waste Management Plan

1.0 Introduction

The purpose of this Waste Management Plan (WMP) for the California Terraces Planning Area (PA) 61 project (project) is to identify potential solid waste impacts that could be generated by construction and operation of the project and propose measures (project design features or mitigation measures) to reduce those impacts.

The WMP addresses all four phases of site development, including the Demolition Phase, Grading Phase, Construction Phase, and the Occupancy (post-construction) Phase. The WMP addresses the amount of waste that could be generated by project activities during each phase; waste reduction goals, and the recommended techniques to achieve the waste reduction goals. More specifically, for each phase, the WMP includes the following:

- Tons of waste anticipated to be generated;
- Material/type and amount of waste anticipated to be diverted;
- Project features that would reduce the amount of waste generated;
- Project features that would divert or limit the generation of waste;
- Source separation techniques for waste generated;
- How materials shall be reused on-site; and
- Name and location of recycling, reuse, or landfill facilities where waste shall be taken.

2.0 Existing Conditions

The project site is located north of State Route 905 (SR-905) and southeast of the intersection of Otay Mesa Road and Ocean View Hills Parkway/Caliente Avenue in the Otay Mesa Community Plan area, in the city of San Diego, Figure 1 shows the regional location. An aerial photograph of the project site and vicinity is shown in Figure 2. The project site is bounded by multi-family uses to the north, SR-905 and open space to the south, San Ysidro High School to the southwest, and vacant land to the east and west. The project site is currently undeveloped.

Project Location

FIGURE 1

Regional Location

RECON

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Image Source: NearMaps (flown Feb 2018)

Project Boundary

FIGURE 2

Project Location on Aerial Photograph

RECON

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3.0 Project Description

The project site is located north of State Route 905 (SR-905), southeast of the intersection of Otay Mesa Road and Ocean View Hills Parkway/Caliente Avenue in the Otay Mesa Community Plan area, in the City of San Diego, California. Figure 1 shows the regional location. An aerial photograph of the project site and vicinity is shown in Figure 2. The project site is bounded by multi-family uses to the north, SR-905 and open space to the south, San Ysidro High School to the southwest, and vacant land to the east and west. The project site is currently undeveloped. Under proposed zoning (RM-2-5), the residential development potential on the project site would be 15 to 29 dwelling units per acre, for a maximum residential buildout up to 267 units. The remaining development would include up to 45,000 square feet of commercial uses and internal roadways and parking lots on an approximately 14.3-acre site. Figure 3 shows the overall site plan for the project.

The proposed mix of land uses for the project is shown in Table 1.

Table 1
Site Development Summary

Land Use	Acres	Dwelling Units	Building Square Footage
Commercial	4.49	–	45,000 sf
Multi-Family Residential	9.20	267 du	138,000 sf
Park	0.19	–	8,400 sf
Streets (private and public)	0.41	–	144,700 sf
Total	**14.29**	**267 du**	**336,100 sf**
du = dwelling unit; sf = square feet			

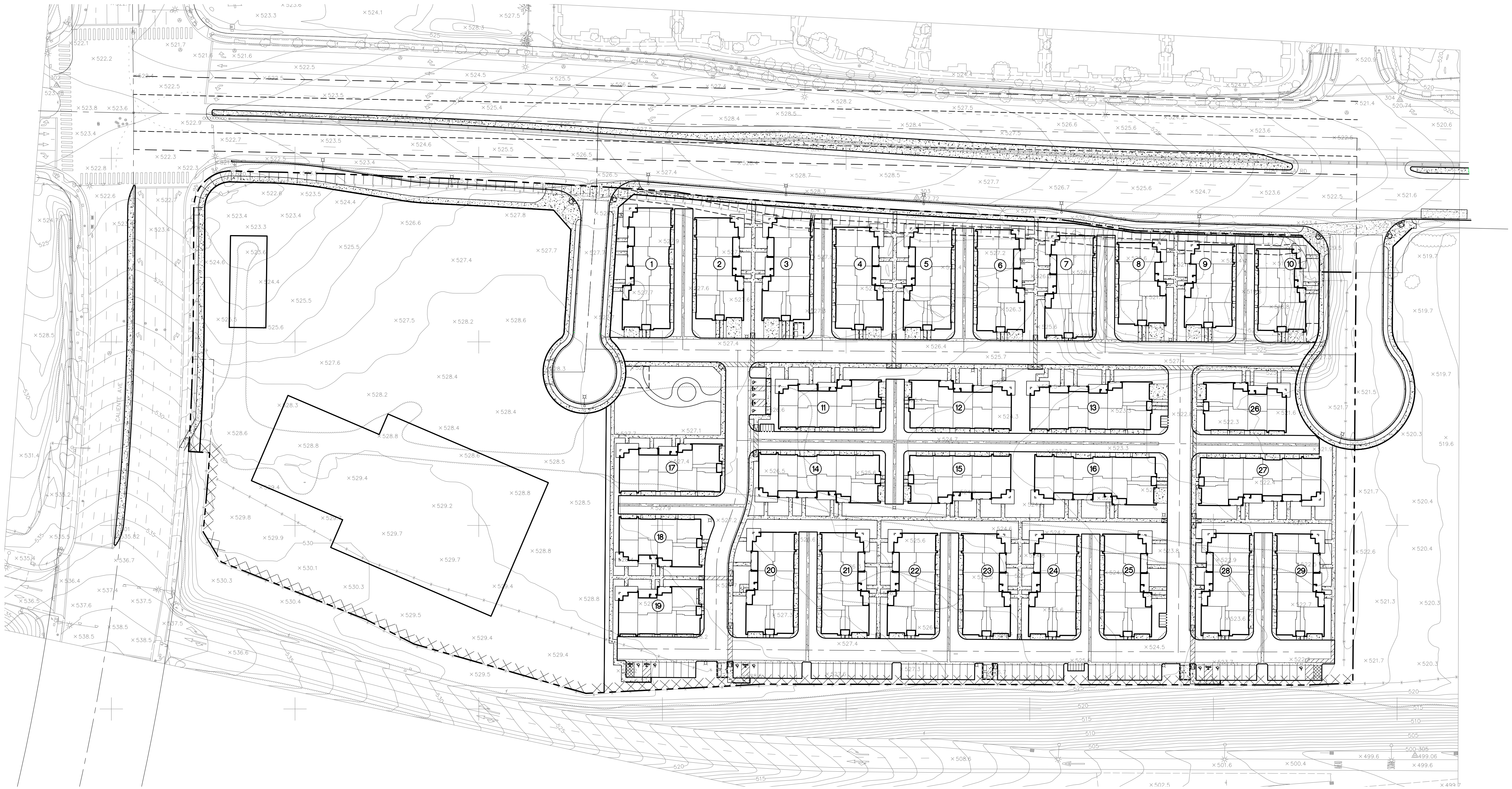
4.0 Regulatory Framework

4.1 State Regulations

The California State Legislature has enacted several bills intended to promote waste diversion. In 1989, Assembly Bill (AB) 939, the Integrated Waste Management Act—as modified in 2010 by Senate Bill 1016—mandated that all local governments reduce disposal waste in landfills from generators within their borders by 50 percent by the year 2000 (State of California 1989, 2010).

AB 341, approved October 2011, sets a statewide policy goal of 75 percent waste diversion by the year 2020 (State of California 2011). This bill also created a mandatory commercial recycling requirement that would hold local jurisdictions responsible for implementing and to be in compliance with the 75 percent diversion rate through outreach and monitoring programs.

Map Source: CivilSense, Inc.



0 Feet 100

FIGURE 3
Site Plan

RECON

AB 1826, approved September 2014, requires businesses in California to arrange for recycling services for organic waste including food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste. The law is effective on and after January 1, 2016 for businesses that generate greater than 8 cubic yards of organic waste per week; effective January 1, 2017 for businesses that generate greater than 4 cubic yards of organic waste per week; effective January 1, 2019 for businesses that generate greater than 4 cubic yards of commercial solid waste per week; and, if a 50 percent statewide reduction in organic waste from 2014 has not yet been achieved, the law will be effective January 1, 2020 for businesses that generate greater than 2 cubic yards of commercial solid waste per week (State of California 2014). Strategies for compliance are discussed in Section 6.2, Waste Reduction Measures.

4.2 City of San Diego Requirements

All landfills within the San Diego region are approaching capacity and are due to close within the next 3 to 20 years. In compliance with the state policies, the City of San Diego (City) Environmental Services Department (ESD) developed the Source Reduction and Recycling Element, which describes local waste management policies and programs. The City's Recycling Ordinance, adopted November 2007, requires on-site recyclable collection for residential and commercial uses (City of San Diego 2007a). The ordinance requires recycling of plastic and glass bottles and jars, paper, newspaper, metal containers, and cardboard. The focus of the ordinance is on education, with responsibility shared between the ESD, haulers, and building owners and managers. On-site technical assistance, educational materials, templates, and service provider lists are provided by the ESD. Property owners and managers provide on-site recycling services and educational materials annually and to new tenants. Strategies for compliance are discussed in Section 6.2, Waste Reduction Measures.

The City's Refuse and Recyclable Materials Storage Regulations, adopted December 2007, addresses the minimum exterior refuse and recyclable material storage areas required at residential and commercial properties (City of San Diego 2007b). These are intended to provide permanent, adequate, and convenient space for the storage and collection of refuse and recyclable materials; encourage recycling of solid waste to reduce the amount of waste material entering landfills; and meet the recycling goals established by the City Council and mandated by the State of California. These regulations are discussed further in Section 6.3, Exterior Storage.

In July 2008, the Construction and Demolition (C&D) Debris Deposit Ordinance was adopted by the City (City of San Diego 2008). The ordinance, which was updated in July 2016, requires that the majority of construction, demolition, and remodeling projects requiring building, combination, or demolition permits pay a refundable C&D Debris Recycling Deposit and divert at least 65 percent of their waste by recycling, reusing, or donating reusable materials. The ordinance is designed to keep C&D materials out of local landfills. Requirements are discussed further in Section 5.4.1, Contractor Education and Responsibilities.

In December 2013, City Council adopted the Zero Waste Objective, implementing the 75 percent diversion of waste target goal from landfills by the year 2020 and zero waste by 2040. An additional City target of 90 percent diversion by 2035 is proposed in the City's Climate Action Plan.

5.0 Demolition, Grading, and Construction Waste Generation and Diversion

This section discussed the waste generation and diversion rates from the demolition, grading, and construction phases of the project.

5.1 Demolition

As discussed in Section 2.0, Existing Conditions, the project site is currently undeveloped (see Figure 2). Therefore, no demolition would be involved, and no demolition waste would be generated.

5.2 Grading

The project site has been previously graded, which resulted in balanced amount of approximately 4,348,000 cubic yards of cut and fill soil (requiring no net export of soil). Any vegetation removed during site preparation would be taken to the Otay Landfill facility for 100 percent diversion. Therefore, no soil export waste would result from the grading phase of the project.

5.3 Construction

The project includes the construction of 29 multi-family residential buildings containing a maximum of 267 units, totaling 138,000 square feet of residential space, as well as 45,000 square feet of commercial space, for a total building square footage of 183,000 square feet. Construction of sidewalks and any new surface parking or driveway areas are not anticipated to generate additional waste during the construction phase. Therefore, the assessment of construction waste is based on the square footage of buildings proposed within the project site.

According to a 2009 sample study by the U.S. Environmental Protection Agency (U.S. EPA), commercial construction projects including office, retail and restaurant space generated an average of 4.3 pounds of construction waste per square foot (U.S. EPA 2009). According to the same sample study, multi-family residential units generate an average of 4.4 pounds per square foot of construction (U.S. EPA 2009). Based on these construction generation rates, the project's total square footage of 183,000 would generate approximately 1,066 tons of construction waste (see calculations below). Table 2 summarizes the project's construction waste by the different land uses.

Table 2 Construction Waste			
Land Use Type	Gross Square Footage	Generation Rate[1] (pounds per square foot)	Tons Generated
Commercial	45,000	4.3	97
Multi-Family Residential	138,000	4.4	304
Total	**183,000**		**401**
[1]U.S. EPA 2009 NOTE: Totals may vary due to independent rounding.			

Commercial:

$$45{,}000 \text{ square feet} \times \frac{4.3 \; pounds}{square \; foot} \times \frac{1 \; ton}{2{,}000 \; pounds} = 96.75 \text{ tons}$$

Multi-Family Residential:

$$138{,}000 \text{ square feet} \times \frac{4.4 \; pounds}{square \; foot} \times \frac{1 \; ton}{2{,}000 \; pounds} = 303.6 \text{ tons}$$

5.4 Waste Diversion

There are two types of waste diversion, “mixed-debris diversion” and “source-separated diversion.” Mixed-debris diversion is a method in which all material waste is disposed of in a single container for transport to a mixed C&D recycling facility where 75 percent of the mixed-debris is diverted for recycling. Under source-separated diversion, materials are separated on-site before transport to appropriate facilities that accept specific material types. Generally, a greater diversion rate is achieved under source-separated diversion, as facilities that accept mixed debris typically achieve 50–70 percent diversion, whereas single materials recyclers often achieve a nearly 100 percent diversion rate (Attachment 1; City of San Diego 2013).

The project would implement source-separated diversion, and recyclable waste materials would be separated on-site into material-specific containers and diverted to an approved recycler selected from the City’s ESD directory of facilities that recycle specific waste materials from construction and demolition (Attachment 2). These facilities achieve a 100 percent diversion rate for most materials with the exception of a 75 percent diversion rate for roof material (mixed C&D debris). Implementing the City’s 75 percent diversion of waste target goal adopted under the Zero Waste Objective requires a majority of waste to be handled at facilities other than landfills.

Construction waste would be diverted or disposed of at nearby facilities based on the material type. Table 3 provides a breakdown of the total tonnage by material type estimated for the project’s construction waste and the closest handling facility.

Table 3 Construction Waste Diversion and Disposal by Material Type					
Material Type	Estimated Waste (tons)[1]	Percent Diverted[2]	Nearest Handling Facility[1]	Estimated Diversion (tons)	Estimated Disposal (tons)
Asphalt and Concrete	75	100	Vulcan Otay Asphalt Recycling Center	76	0
Metals	118	100	Cactus Recycling	118	0
Brick/Masonry/Tile	36	100	Vulcan Carol Canyon Landfill and Recycle Site	36	0
Clean Wood/Wood Pallets	20	100	Otay Landfill	20	0
Carpet, Padding/Foam	8	100	DFS Flooring	8	0
Drywall	22	100	EDCO Recovery & Transfer	22	0
Corrugated Cardboard	32	100	Cactus Recycling	32	0
Trash/Garbage	89	0	Otay Landfill	0	89
Total	**401**			**312 (78%)**	**89 (22%)**
NOTE: Totals may vary due to independent rounding. [1]City of San Diego ESD 2017 Certified C&D Recycling Facility Directory (see Attachment 2).					

With implementation of the diversion-estimated calculations outlined in Table 3, it is estimated that 78 percent of the waste generated during the construction phase of the project would be diverted to appropriate facilities for reuse. Thereafter, 89 tons (trash/garbage), equivalent to 22 percent of the total construction waste, would be required to be disposed of in the landfill.

5.4.1 Contractor Education and Responsibilities

In order to ensure that the anticipated diversion of waste would occur during project construction, the project would include the designation of a Solid Waste Management Coordinator (SWMC) for the duration of project construction. The SWMC would ensure that all contractors and subcontractors are educated and trained to follow City waste diversion regulations and that procedures for waste reduction and recycling efforts are implemented. Specific responsibilities of the SWMC would include the following:

- Review of the WMP at the preconstruction meeting, including the SWMC responsibilities.
- Distribute the WMP to all contractors when they first begin work on-site and when training workers, subcontractors, and suppliers on proper waste management procedures applicable to the project.
- Work with the contractors to estimate the quantities of each type of material that would be salvaged, recycled, or disposed of as waste, then assist in documentation.

- Use detailed material estimates to reduce risk of unplanned and potentially wasteful material cuts.
- Review and enforce procedures for source-separated receptacles. Containers of various sizes shall:
  - Be placed in readily accessible areas that will minimize misuse or contamination.
  - Be clearly labeled with a list of acceptable and unacceptable materials, the same as the materials recycled at the receiving material recovery facility or recycling processor.
  - Contain no more than 10 percent non-recyclable materials, by volume.
  - Be inspected daily to remove contaminants and evaluate discarded material for reuse on-site.
- Review and enforce procedures for transportation of materials to appropriate recipients selected from ESD's directory of facilities that recycle C&D materials (see Attachment 2 for ESD's facility directory).
- Ensure removal of C&D waste materials from the project site at least once every week to ensure no over-topping of containers. The accumulation and burning of on-site construction, demolition, and land-clearing waste materials will be prohibited.
- Document the return or reuse of excess materials and packaging to enhance the diversion rate.
- Coordinate implementation of a "buy recycled" program for green construction products, including incorporating mulch and compost into the landscaping.
- Coordinate implementation of solid waste mitigation with other requirements such as storm water requirements, which may include specifications such as the placement of bins to minimize the possibility of runoff contamination.

The SWMC would ensure that the project meets the following state law and City Municipal Code requirements. Adjustments would be made as needed to maintain conformance:

- The City's C&D Debris Diversion Deposit Program, which requires a refundable deposit based on the tonnage of the expected recyclable waste materials as part of the building permit requirements (City of San Diego 2008).
- The City's Recycling Ordinance, which requires that collection of recyclable materials is provided (City of San Diego 2007a).
- The City's Storage Ordinance, which requires that areas for recyclable material collection must be provided (City of San Diego 2007b).
- The name and contact information of the waste contractor provided to ESD at least 10 days prior to the start of any work and updated within 5 days of any changes.

5.4.2 Total Diversion

With the oversight of the SWMC, the project would meet City waste diversion goals. Table 4 summarizes the amount of waste estimated to be generated and diverted by each phase of the project. Of the 401 tons estimated to be generated, 312 tons would be diverted, primarily through source separation. This would result in the diversion and reuse of 78 percent of the waste material generated from the project from the landfill.

Table 4
Total Waste Generated, Diverted, and Disposed of by Phase

Phase	Tons Generated	Tons Diverted		Tons Disposed	
Demolition	0	0		0	
Grading	0	0		0	
Construction	401	312	(78%)	89	(22%)
Total	**401**	**312**	**(78%)**	**89**	**(22%)**
NOTE: Totals may vary due to independent rounding.					

6.0 Occupancy–Operational Waste

6.1 Waste Generation

The annual waste estimated to be generated during occupancy of the project was calculated using the City ESD Waste Generation Factors for Commercial (General Retail[1]) and multi-family residential (Attachment 3). The estimated solid waste generation rate for commercial uses (general retail) is 0.0028 ton/square foot/year. The estimated solid waste generation rate for multi-family residential is 1.2 tons/year/unit. The estimated annual operational amount in tons is based on 45,000 square feet of general retail (commercial) space and 267 multi-family dwelling units, calculated below. Table 5 shows the amount of waste that would be generated during the occupancy phase.

Table 5
Occupancy Phase Annual Waste Generation

Land Use Type	Amount	Annual Generation Rate[1]	Waste Generated[2,3]
Commercial (General Retail)	45,000 sf	0.0028 tons/sf/year	126
Multi-family Residential	267 du	1.2 tons/year/du	321
Total			**447**

du = dwelling unit; sf = square feet
[1]City of San Diego Environmental Services Department, Waste Generation Factors – Occupancy Phase (see Attachment 3)
[2]Tons per year
[3]Totals may vary due to independent rounding.

[1]Since commercial uses within the project site are unknown at this time, this Waste Management Plan assumes a waste generation factor for "General Retail" commercial uses, as identified in the City ESD Waste Generation Factors document (Attachment 3).

Commercial (General Retail):

$$45{,}000 \text{ square feet} \times \frac{0.0028\ tons}{square\ feet/year} = 126 \text{ tons/year}$$

Multi-Family Residential:

$$270 \text{ dwelling units} \times \frac{1.2\ tons}{year} = 320.4 \text{ tons/year}$$

The total generation of waste for the total proposed building space of 485,604 square feet equates to approximately 447 tons per year. As discussed in Section 6.2 below, the applicant (or applicant's successor in interest) would implement a long-term waste management plan to manage waste disposal in order to meet state and City waste reduction goals.

6.2 Waste Reduction Measures

According to the City Waste Management Guidelines (City of San Diego 2013), compliance with the City's Recycling Ordinances is expected to provide a minimum recycling service volume of 40 percent for large complexes. Therefore, waste anticipated to be diverted during the occupancy phase would be approximately 179 tons per year. The remaining 268 tons per year would, however, exceed the 60 ton-per-year threshold of significance for a cumulative impact on solid waste services in the City (City of San Diego 2016).

To mitigate for the cumulative impact on solid waste, the applicant (or applicant's successor in interest) shall be responsible for implementing a long-term waste management program. This program shall include recyclable collection services required by and in accordance with the Recycling Ordinance, as well as providing exterior storage space for refuse, recyclable materials, and a means of handling landscaping and green waste materials. Specific program measures shall include the following:

- For commercial facilities, which receive solid waste collection services from a Franchisee, the responsible person shall provide on-site recycling services to occupants as required by the dates prescribed in the San Diego Municipal Code, Chapter 6, Article 6, Division 7, Section 66.0707a.

- For multi-family residential facilities which receive solid waste collection services from a Franchisee, the responsible person shall provide on-site recycling services to occupants as required by the dates prescribed in the San Diego Municipal Code, Chapter 6, Article 6, Division 7, Section 66.0706c.

- Occupants of commercial facilities, which receive solid waste collection services from a Franchisee, shall participate in a recycling program by separating recyclable material from other solid waste and depositing the recyclable materials in the recycling container provided by the Franchisee or Recyclable Materials Collector.

- Occupants of multi-family residential facilities which receive solid waste collection services from a Franchisee, shall participate in a recycling program by separating recyclable material from other solid waste and depositing the recyclable materials in the recycling container provided by the Franchisee or Recyclable Materials Collector (San Diego Municipal Code, Chapter 6, Article 6, Division 7, Section 66.0706d).

- At a minimum, commercial facilities' recycling services would include the following (San Diego Municipal Code, Chapter 6, Article 6, Division 7, Section 66.0707c):

  1. Collection of recyclable materials as frequently as necessary to meet demand.

  2. Collection of plastic bottles and jars, paper, newspaper, metal containers, cardboard, and glass containers.

  3. Collection of other recyclable materials for which markets exist, such as scrap metal, wood pallets, and food waste.

  4. Utilization of recycling receptacles which comply with the standards in the Container and Signage Guidelines established by the City ESD or its successor.

  5. Designated recycling collection and storage areas.

  6. Signage on all recycling receptacles, containers, and/or enclosures which comply with the standards described in the Container and Signage Guidelines established by the City ESD or its successor.

- At a minimum, multi-family residential facilities' recycling services would include the following (San Diego Municipal Code, Chapter 6, Article 6, Division 7, Section 66.0706e):

  1. Collection of recyclable materials at least two times per month.

  2. Collection of plastic bottles and jars, paper, newspaper, metal containers, cardboard, and glass containers.

  3. Utilization of recycling receptacles which comply with the standards in the Container and Signage Guidelines established by the City ESD or its successor.

  4. Designated recycling collection and storage areas.

  5. Signage on all recycling receptacles, containers, chutes, and/or enclosures which comply with the standards described in the Container and Signage Guidelines established by the City ESD or its successor.

- Occupant Education – For commercial facilities, the responsible person shall ensure that occupants are educated about the recycling services as follows (San Diego Municipal Code, Chapter 6, Article 6, Division 7, Section 66.0707d):

1. Information, including the types of recyclable materials accepted, the location of recycling containers, and the occupants' responsibility to recycle, shall be distributed to all occupants annually.

2. All new occupants shall be given educational information on recycling programs and procedures and instructions upon occupancy.

3. All occupants shall be given information and instructions upon any change in recycling service to the facility.

- Occupant Education – For multi-family residential facilities, the responsible person shall ensure that occupants are educated about the recycling services as follows (San Diego Municipal Code, Chapter 6, Article 6, Division 7, Section 66.0706f):

1. Information, including the types of recyclable materials accepted, the location of recycling containers, and the occupants' responsibility to recycle, shall be distributed to all occupants annually.

2. All new occupants shall be given information and instructions upon occupancy.

3. All occupants shall be given information and instructions upon any change in recycling service to the facility.

Implementation of a project-specific waste management program would reduce the project's cumulative portion of impacts on solid waste, as, per the City's California Environmental Quality Act Significance Determination Thresholds, the implementation of a WMP would ensure that the overall waste produced is reduced sufficiently to comply with waste reduction targets established in the Public Resources Code (City of San Diego 2016).

6.3 Exterior Storage

The project would be required to implement the City's Municipal Code on-site refuse and recyclable material storage space requirements (City of San Diego 2007b) for the duration of project occupancy. Tables 6 and 7 show the City's exterior storage area requirements for commercial and residential developments, respectively, and the application of the requirements to the project.

Table 6 Minimum Exterior Refuse and Recyclable Material Storage Areas for Non-Residential Development			
Gross Floor Area per Development (square feet)	Minimum Refuse Storage Area per Development (square feet)	Minimum Recyclable Material Storage Area per Development (square feet)	Total Minimum Storage Area per Development (square feet)
0–5,000	12	12	24
5,001–10,000	24	24	48
10,001–25,000	48	48	96
25,001–50,000	96	96	192
50,001–75,000	144	144	288
75,001–100,000	192	192	384
100,000+	192 plus 48 square feet for every 25,000 square feet of building area above 100,001	192 plus 48 square feet for every 25,000 square feet of building area above 100,001	384 plus 96 square feet for every 25,000 square feet of building area above 100,001
Project (45,000 sf)	**96**	**96**	**192**
SOURCE: City of San Diego Municipal Code, Article 2, Division 8: Refuse and Recyclable Material Storage Regulations, Section 142.0830, Table 142-08C			

Table 7 Minimum Exterior Refuse and Recyclable Material Storage Areas for Residential Development			
Number of units	Minimum Refuse Area (square feet)	Minimum Recyclable Area (square feet)	Total Storage Area (square feet)
2-6	12	12	24
7-15	24	24	48
16-25	48	48	96
26-50	96	96	192
51-75	144	144	288
76-100	192	192	384
101-125	240	240	480
126-150	288	288	576
151-175	336	336	672
176-200	384	384	768
200+	384 plus 48 square feet for every 25 dwelling units above 201	384 plus 48 square feet for every 25 dwelling units above 201	768 plus 96 square feet for every 25 dwelling units above 201
Total	**480**	**480**	**960**
SOURCE: City of San Diego Municipal Code, Chapter 14, Article 2, Division 8: Refuse and Recyclable Material Storage Regulations, Section 142.0820, Table 142-08B.			

The project includes the construction of 45,000 square feet of commercial uses. As shown in Table 6, the project would require a minimum of 96 square feet of refuse storage area and a minimum of 96 square feet of recyclable material storage area. The total exterior refuse and recyclable material storage requirement for the project's non-residential uses would be 192 square feet.

The project includes the construction of 267 dwelling units. As shown in Table 7, the project would require a minimum of 480 square feet of refuse storage area and a minimum of

480 square feet of recyclable material storage area would be required. The total exterior refuse/recyclable material storage requirement for the project's residential uses would be 960 square feet. Overall, the total amount of refuse and recyclable material storage areas for its commercial and residential development is equivalent to 1,152 square feet. Site plans would be required to show the location and required square footage of refuse and recyclable storage areas.

6.4 Organic Waste Recycling

The project would incorporate landscaping and landscape maintenance. Drought-tolerant plants would be used to reduce the amount of green waste produced. Collection of organic waste and its disposal at recycling centers that accept organic waste would further reduce the waste generated by the project during occupancy. An ongoing WMP would include a means for handling landscaping and other organic waste materials.

7.0 Conclusion

7.1 Demolition, Grading, and Construction Waste

A total of approximately 401 tons of material would be generated from the construction phase of the project, of which 312 tons would be diverted through recycling at source-separated facilities that achieve a 100 percent diversion rate. When necessary, mixed debris and trash would be recycled at a lower diversion rate, leaving 89 tons to be disposed of. This amounts to an approximate solid waste diversion rate of 78 percent that would be diverted from the landfill.

7.2 Occupancy–Operational Waste

The project would include 45,000 square feet of commercial uses and 267 multi-family dwelling units, generating approximately 447 tons of waste per year. As such, the project would be required to provide a minimum of 96 square feet of exterior refuse area and 96 square feet of recyclable material storage area (total of 192 square feet; see Table 6) for the commercial area. In addition, the provision of 480 square feet of exterior refuse area and 480 square feet of recyclable material storage area (total of 960 square feet; see Table 7) would be required for the residential area. The applicant (or applicant's successor in interest) would implement ongoing waste reduction measures as prescribed in this WMP to ensure that the waste is minimized and the operation of the project complies with City ordinances. According to the City of San Diego Waste Management Guidelines (City of San Diego 2013), compliance with existing ordinances is expected to achieve a 40 percent diversion rate. Therefore, approximately 269 tons of non-recyclable waste per year would be generated from the project, exceeding the 60 ton-per-year threshold of significance for having a cumulative impact on solid waste. However, preparation of this WMP and implementation of the Waste Reduction Measures, outlined in Section 6.2 above, would ensure the cumulative solid waste impact is reduced to below a level of significance.

7.3 Overall Compliance

With implementation of the strategies outlined in this WMP and compliance with all applicable City ordinances, solid waste impacts would be reduced to below a level of significance regarding collection, diversion, and disposal of waste generated from C&D, grading, and occupancy. The implementation of a SWMC for the project during demolition, grading, and construction phases would achieve a 78 percent of waste diverted from landfill disposal.

During occupancy, the applicant or applicant's successor in interest would be required to implement the ongoing WMP measures detailed herein to ensure maximum diversion from landfills. Implementation of the WMP would include provisions to provide adequate exterior storage space for refuse, recyclable, and landscape/green waste materials.

This WMP outlines strategies to achieve 78 percent of waste being diverted from disposal during C&D of the project. This would reduce the anticipated impact of waste disposal to below the direct impact threshold of significance. Without implementation of WMP measures, the occupancy phase would only achieve 40 percent diversion. However, with implementation of ongoing WMP measures detailed in Section 6.2, and achievement of a 78 percent diversion rate during the C&D phase, the project would achieve overall compliance.

8.0 References Cited

California, State of

1989 Assembly Bill 939. Integrated Waste Management Act.

2010 Senate Bill 1016. Solid Waste Per Capita Disposal Measurement Act.

2011 Assembly Bill 341. Jobs and Recycling.

2014 Assembly Bill 1826. Solid Waste: Organic Waste.

San Diego, City of

2007a Recycling Ordinance. San Diego Municipal Code Chapter 6, Article 6, Division 7. November 20, 2007.

2007b Refuse and Recyclable Materials Storage Regulations. Municipal Code Chapter 14, Article 2, Division 8. December 9, 2007.

2008 Construction and Demolition Debris Diversion Deposit Program. San Diego Municipal Code Chapter 6, Article 6, Division 6.

2013 California Environmental Quality Act – Guidelines for a Waste Management Plan. June 2013. Available at https://www.sandiego.gov/sites/default/files/legacy/environmental-services/pdf/recycling/wmpguidelines.pdf. Accessed on December 22, 2016.

2016 Significance Determination Thresholds. California Environmental Quality Act. July.

2017 Certified Construction & Demolition Recycling Facility Directory. October.

United States Environmental Protection Agency (U.S. EPA)
2009 Estimating 2003 Building-Related Construction and Demolition Materials Amounts. March.

ATTACHMENTS

ATTACHMENT 1

City of San Diego Environmental Services Department
Construction & Demolition Debris Conversion Rate Table

CITY OF SAN DIEGO
CONSTRUCTION & DEMOLITION (C&D) DEBRIS CONVERSION RATE TABLE

The City of San Diego

ENVIRONMENTAL SERVICES DEPARTMENT

This worksheet lists materials typically generated from a construction or demolition project and provides formulas for converting common units (i.e., cubic yards, square feet, and board feet) to tons. It should be used for preparing your Waste Management Form, which requires that quantities be provided in tons.

Step 1
Enter the estimated quantity for each applicable material in Column I, based on units of cubic yards (cy), square feet (sq ft), or board feet (bd ft).

Step 2
Multiply by Tons/Unit figure listed in Column II. Enter the result for each material in Column III. If using Excel version, column III will automatically calculate tons.

Step 3
Enter quantities for each separated material from Column III on this worksheet into the corresponding section of your Waste Management Form.

For your final calculations, use the actual quantities, based on weight tags, gate receipts, or other documents.

		Column I			Column II		Column III
Category	**Material**	**Volume**	**Unit**		**Tons/Unit**		**Tons**
Asphalt/Concrete	Asphalt (broken)		cy	x	0.70	=	
	Concrete (broken)		cy	x	1.20	=	
	Concrete (solid slab)		cy	x	1.30	=	
Brick/Masonry/Tile	Brick (broken)		cy	x	0.70	=	
	Brick (whole, palletized)		cy	x	1.51	=	
	Masonry Brick (broken)		cy	x	0.60	=	
	Tile		sq ft	x	0.00175	=	
Building Materials (doors, windows, cabinets, etc.)			cy	x	0.15	=	
Cardboard (flat)			cy	x	0.05	=	
Carpet	By square foot		sq ft	x	0.0005	=	
	By cubic yard		cy	x	0.30	=	
Carpet Padding/Foam			sq ft	x	0.000125	=	
Ceiling Tiles	Whole (palletized)		sq ft	x	0.0003	=	
	Loose		cy	x	0.09	=	
Drywall (new or used)	1/2" (by square foot)		sq ft	x	0.0008	=	
	5/8" (by square foot)		sq ft	x	0.00105	=	
	Demo/used (by cubic yd)		cy	x	0.25	=	
Earth	Loose/Dry		cy	x	1.20	=	
	Excavated/Wet		cy	x	1.30	=	
	Sand (loose)		cy	x	1.20	=	
Landscape Debris (brush, trees, etc)			cy	x	0.15	=	
Mixed Debris	Construction		cy	x	0.18	=	
	Demolition		cy	x	1.19	=	
Scrap metal			cy	x	0.51	=	
Shingles, asphalt			cy	x	0.22	=	
Stone (crushed)			cy	x	2.35	=	
Unpainted Wood & Pallets	By board foot		bd ft	x	0.001375	=	
	By cubic yard		cy	x	0.15	=	
Garbage/Trash			cy	x	0.18	=	
Other (estimated weight)			cy	x	estimate	=	
			cy	x	estimate	=	
			cy	x	estimate	=	
			cy	x	estimate	=	

Total All ____________

ATTACHMENT 2

City of San Diego 2017 Construction & Demolition Recycling Facility Directory

2017 Certified Construction & Demolition Recycling Facility Directory

These facilities are certified by the City of San Diego to accept materials listed in each category. Hazardous materials are not accepted. The diversion rate for these materials shall be considered 100%, except mixed C&D debris which updates quarterly. The City is not responsible for changes in facility information. Please call ahead to confirm details such as accepted materials, days and hours of operation, limitations on vehicle types, and cost. For more information visit: www.recyclingworks.com.

Please note: In order to receive recycling credit, Mixed C&D Facility and transfer station receipts must: *-be coded as construction & demolition (C&D) debris* *-have project address or permit number on receipt* **Make sure to notify weighmaster that your load is subject to the City of San Diego C&D Ordinance.* *Note about landfills: Miramar Landfill and other landfills do not recycle mixed C&D debris.*	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
EDCO Recovery & Transfer 3660 Dalbergia St, San Diego, CA 92113 619-234-7774 | www.edcodisposal.com/public-disposal	71%											•					
EDCO Station Transfer Station & Buy Back Center 8184 Commercial St, La Mesa, CA 91942 619-466-3355 | www.edcodisposal.com/public-disposal	71%				•							•			•		
EDCO CDI Recycling & Buy Back Center 224 S. Las Posas Rd, San Marcos, CA 92078 760-744-2700 | www.edcodisposal.com/public-disposal	90%				•										•		
Escondido Resource Recovery 1044 W. Washington Ave, Escondido 760-745-3203 | www.edcodisposal.com/public-disposal	71%																
Fallbrook Transfer Station & Buy Back Center 550 W. Aviation Rd, Fallbrook, CA 92028 760-728-6114 | www.edcodisposal.com/public-disposal	71%				•										•		
Otay C&D/Inert Debris Processing Facility 1700 Maxwell Rd, Chula Vista, CA 91913 619-421-3773 | www.sd.disposal.com	75%																
Ramona Transfer Station & Buy Back Center 324 Maple St, Ramona, CA 92065 760-789-0516 | www.edcodisposal.com/public-disposal	71%				•										•		
SANCO Resource Recovery & Buy Back Center 6750 Federal Blvd, Lemon Grove, CA 91945 619-287-5696 | www.edcodisposal.com/public-disposal	71%				•										•		
All American Recycling 10805 Kenney St, Santee, CA 92071 619-508-1155 (Must call for appointment)						•											
Allan Company 6733 Consolidated Wy, San Diego, CA 92121 858-578-9300 | www.allancompany.com/facilities.htm					•										•		
Allan Company Miramar Recycling 5165 Convoy St, San Diego, CA 92111 858-268-8971 | www.allancompany.com/facilities.htm					•										•		
AMS 4674 Cardin St, San Diego, CA 92111 858-541-1977 | www.a-m-s.com								•									

	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
Armstrong World Industries, Inc. 300 S. Myrida St, Pensacola, FL 32505 877-276-7876 (Press 1, Then 8) www.armstrong.com/commceilingsna								•									
Cactus Recycling 8710 Avenida De La Fuente, San Diego, CA 92154 619-661-1283 | www.cactusrecycling.com					•								•		•		•
DFS Flooring 10178 Willow Creek Road, San Diego, CA 92131 858-630-5200 | www.dfsflooring.com						•	•										
Duco Metals 220 Bingham Drive Suite 100, San Marcos, CA 92069 760-747-6330 | www.ducometals.com															•		
Enniss Incorporated 12421 Vigilante Rd, Lakeside, CA 92040 619-443-9024 | www.ennissinc.com		•	•						•	•							
Escondido Sand and Gravel 500 N. Tulip St, Escondido, CA 92025 760-432-4690 | www.weirasphalt.com/esg		•															
Habitat for Humanity ReStore 10222 San Diego Mission Rd, San Diego, CA 92108 619-516-5267 | www.sdhfh.org/restore.php				•													
Hanson Aggregates West – Lakeside Plant 12560 Highway 67, Lakeside, CA 92040 858-547-2141		•															
Hanson Aggregates West – Miramar 9229 Harris Plant Rd, San Diego, CA 92126 858-974-3849		•								•							
HVAC Exchange 2675 Faivre St, Chula Vista, CA 91911 619-423-1855 | www.thehvacexchange.com															•		
IMS Recycling Services 2740 Boston Ave, San Diego, CA 92113 619-423-1564 | www.imsrecyclingservices.com					•								•				
IMS Recycling Services 2697 Main St, San Diego, CA 92113 619-231-2521 | www.imsrecyclingservices.com													•		•		
Inland Pacific Resource Recovery 12650 Slaughterhouse Canyon Rd, Lakeside, CA 92040 619-390-1418											•						
Lamp Disposal Solutions 1405 30th Street, San Diego, CA 92154 858-569-1807 | www.lampdisposalsolutions.com														•			
Los Angeles Fiber Company 4920 S. Boyle Ave, Vernon, CA 90058 323-589-5637 | www.lafiber.com						•	•										

	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
Miramar Greenery, City of San Diego 5180 Convoy St, San Diego, CA 92111 858-694-7000 | www.sandiego.gov/environmental-services/miramar/greenery.shtml											•						
Moody's 3210 Oceanside Blvd., Oceanside, CA 92056 760-433-3316		•								•						•	
Otay Valley Rock, LLC 2041 Heritage Rd, Chula Vista, CA 91913 619-591-4717 | www.otayrock.com		•															
Reclaimed Aggregates Chula Vista 855 Energy Wy, Chula Vista, CA 91913 619-656-1836		•														•	
Reconstruction Warehouse 3650 Hancock St., San Diego, CA 92110 619-795-7326 | www.recowarehouse.com				•													
Robertson's Ready Mix 2094 Willow Glen Dr, El Cajon, CA 92019 619-593-1856		•								•						•	
Romero General Construction Corp. 8354 Nelson Wy, Escondido, CA 92026 760-749-9312 | www.romerogc.com/crushing/nelsonway.htm		•															
SA Recycling 3055 Commercial St., San Diego, CA 92113 619-238-6740 | www.sarecycling.com															•		
SA Recycling 1211 S. 32nd St., San Diego, CA 92113 619-234-6691 | www.sarecycling.com															•		
Universal Waste Disposal 8051 Wing Avenue, El Cajon, CA 92020 619-438-1093 | www.universalwastedisposal.com														•			
Vulcan Carol Canyon Landfill and Recycle Site 10051 Black Mountain Rd, San Diego, CA 92126 858-530-9465 | www.vulcanmaterials.com		•	•							•						•	
Vulcan Otay Asphalt Recycle Center 7522 Paseo de la Fuente, San Diego, CA 92154 619-571-1945 | www.vulcanmaterials.com		•															

ATTACHMENT 3

City of San Diego Waste Generation
Factors – Occupancy Phase

Waste Generation Factors – Occupancy Phase

The following factors are used by the City of San Diego Environmental Services Department to estimate the expected waste generation in a new residential or commercial development.

Residential Uses
Residential Unit = 1.6 tons/year/unit
Multi-family Unit = 1.2 tons/year/unit

Example: To calculate the amount of waste that will be generated from a project with 100 new homes, multiply the number of homes by the generation factor.
100 single family homes x 1.6 = 160 tons/year
100 multi-family units x 1.2 = 120 tons/year

Commercial/Industrial Uses	
General Retail	0.0028
Restaurants & Bars	0.0122
Hotels/Motels	0.0045
Food Stores	0.0073
Auto/Service/Repair	0.0051
Medical Offices	0.0033
Hospitals	0.0055
Office	0.0017
Transp/Utilities	0.0085
Manufacturing	0.0059
Education	0.0013
Unclassified Services	0.0042

Example: To calculate the amount of waste that could be generated from a new building with 10,000 square feet for offices and 10,000 square feet for manufacturing, multiply the square footage for each use by the generation factor.
10,000 square feet x 0.0017 = 17 tons/year
10,000 square feet x 0.0059 = 59 tons per year
Total estimated waste generation for building = 76 tons/year

DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER

CONSULTING ENGINEERS

WATER STUDY
FOR THE CALIFORNIA TERRACES
PLANNING AREA 61 PROJECT
IN THE CITY OF SAN DIEGO

September 14, 2018

2234 FARADAY AVENUE • CARLSBAD, CA • (760) 438-4422

WATER STUDY
FOR THE CALIFORNIA TERRACES
PLANNING AREA 61 PROJECT
IN THE CITY OF SAN DIEGO

September 14, 2018

REGISTERED PROFESSIONAL ENGINEER
STEVEN J. HENDERSON
C 87620
EXP. 09/30/19
CIVIL
STATE OF CALIFORNIA

9-14-2018

Prepared by:
Dexter Wilson Engineering, Inc.
2234 Faraday Avenue
Carlsbad, CA 92008
(760) 438-4422

Job No. 648-032

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DEXTER WILSON ENGINEERING, INC.

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ANDREW M. OVEN, P.E.
STEPHEN M. NIELSEN, P.E.
NATALIE J. FRASCHETTI, P.E.
STEVEN J. HENDERSON, P.E.

September 14, 2018 648-032

Pardee Homes
13400 Sabre Springs Parkway, Suite 200
San Diego, CA 92128

Attention: Allen Kashani, Director of Project Management

Subject: Water Study for the California Terraces Planning Area 61 Project in the City of San Diego

Introduction

This report provides a water study for the California Terraces Planning Area 61 (PA61) project in the City of San Diego. The project proposes up to 45,000 SF of commercial uses within Lot 1 totaling 195,584 SF (4.49 AC) and multi-family residential units including affordable units and a private recreation park all within Lot 2 totaling 400,752 SF (9.20 AC). The residential development permits a density of 15 to 29 units per acre within the RM-2-5 zone and would allow Lot 2 to construct up to a maximum of 267 multi-family residential units. The 13.7 gross acres project site is located at the southeast corner of Otay Mesa Road and Caliente Ave and within the Otay Mesa Community Plan Area.

Figure 1 provides a location map for the project and a conceptual site plan is attached as Appendix A.

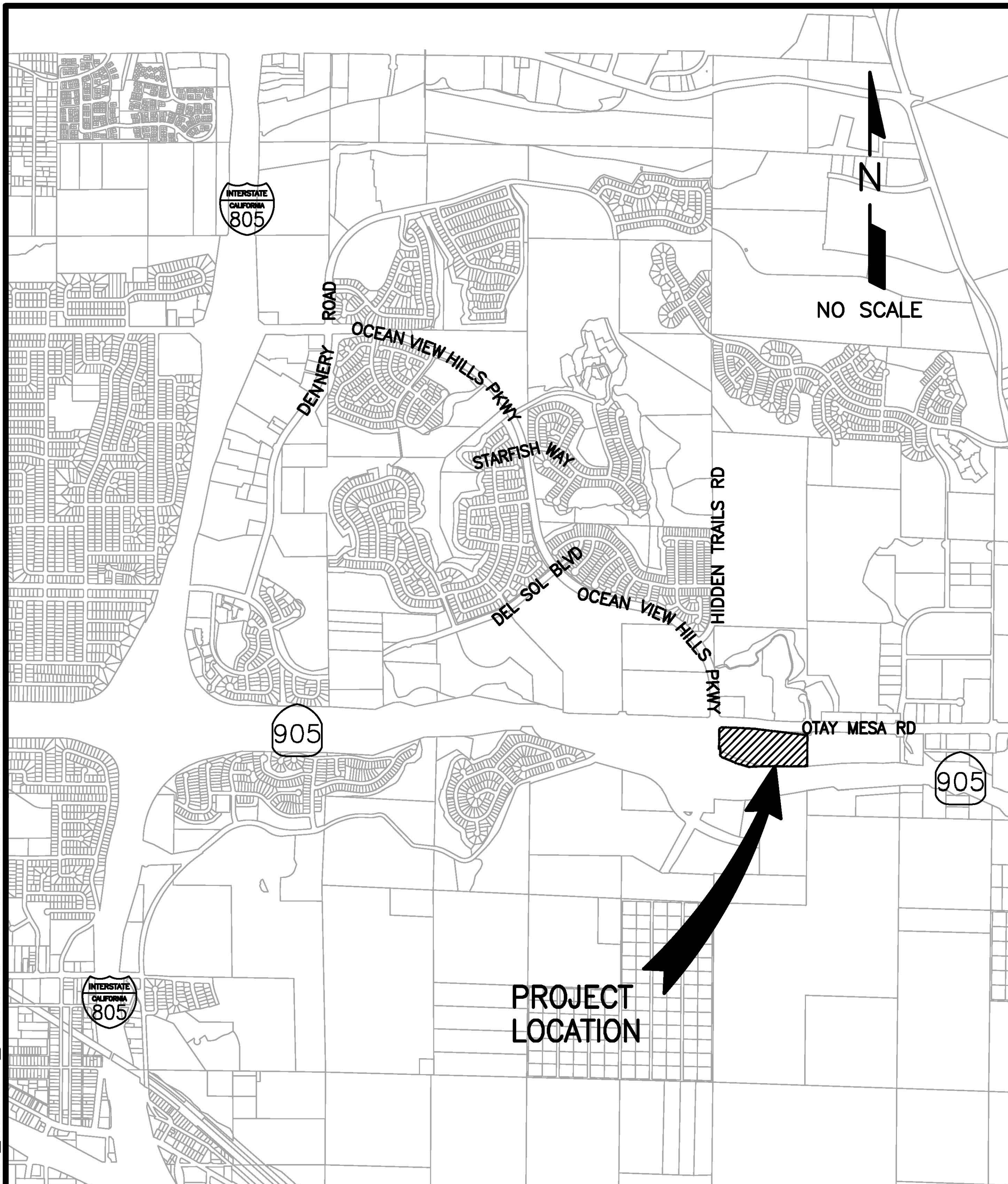

FIGURE 1

LOCATION MAP

PA61

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\ARTIC\DWG\648032\PA61_FIGURE-1_VM.DWG 04-11-18 14:39:44 LAYOUT: LAYOUT1

Purpose of Study

The purpose of this study is to analyze and determine if the existing public water system is able to provide adequate domestic and fire protection service for the PA61 project. This report will address if any offsite (public) water system improvements are needed for the development of the project so that the offsite water system will be in conformance with the City of San Diego Water Department water system design standards.

An overview of the proposed water system(s) will be presented as well. In conformance with City design and operations standards, there will be two separate private onsite water systems. A looped fire protection system along with two private domestic systems (residential and commercial) will be constructed as part of the onsite water system and connected to the existing City system.

Study Area

The study area for this report is the boundary of the PA61 project and the water system surrounding the project. The extent of the existing water system which was incorporated into the analysis of the project site was based on the existing Otay Mesa 680 Zone distribution system that serves the area.

All onsite water lines will be private and will connect to the City's public water system via approved backflow preventers and meters at each end of the PA61 project boundary. A preliminary analysis of the onsite private fire protection system is included in this report. The private domestic water facilities will be under a separate report/study.

PA61 Project Water Demand

The water demands were developed in accordance with the City of San Diego Design Guidelines and Standards. Multi-family residential water demand is estimated based on density and a unit water demand of 150 gpd/person. The PA61 project proposes up to 267 residential units over 9.20 net acres equaling 29.0 units per acre. Table 2-1 in the City of

San Diego Design Guidelines and Standards, attached as Appendix C, indicates that 29.0 units per acre falls in the range of 3.0 persons per dwelling unit. A dwelling unit density of 3.0 persons per dwelling unit and a unit water demand of 150 gpd/person results in a water demand rate of 450 gpd per multi-family dwelling unit at the project.

Table 1 presents the projected potable water demand for the PA61 project.

TABLE 1
PA61 PROJECT
POTABLE WATER DEMAND

Land Use	Quantity	Demand Factor	Average Water Use, gpd
Multi-Family Residential (29 DUs/net acre)	267 Units	450 gpd/DU	120,150
Commercial	4.49 Acres	5,000 gpd/acre	22,450
TOTAL			**142,600 = 99.0 gpm**

From the City of San Diego Guidelines and Standards, Figure 2-2, the maximum day demand to average annual demand ratio is approximately 2.3 based on the Coastal/Downtown peaking curve, resulting in an estimated maximum day demand in the pressure zone of 327,980 gpd (228 gpm).

From the City of San Diego Guidelines and Standards, Figure 2-1, the peak hour demand to average annual demand ratio is approximately 6.0 based on the Coastal/Downtown peaking curve, resulting in an estimated peak hour demand of 855,600 gpd (594 gpm).

Appendix B of this report presents the backup data for determining these peaking factors.

City of San Diego Design Criteria

Book 2 of the City of San Diego Guidelines and Standards was used to analyze the existing water system.

A summary of the design criteria from Book 2 is presented as Table 2.

TABLE 2 CITY OF SAN DIEGO WATER SYSTEM DESIGN CRITERIA	
Criteria	**Design Requirement**
Multi-Family Residential Fire Flow	3,000 gpm
Commercial Fire Flow	4,000 gpm
Minimum Static Pressure	65 psi
Maximum Static Pressure	120 psi
Maximum Pressure Drop – Reservoir Out of Service	40 psi
Maximum Pressure Drop – Peak Hour & Max Day plus Fire	25 psi
Minimum Pressure – Peak Hour	40 psi
Minimum Pressure – Max Day plus Fire	20 psi
Maximum Pipeline Velocity (Fire Flow)[1]	15 fps
Maximum Pipeline Velocity (Normal Operating Conditions)[2]	5 fps

[1] Section 3.3.1 E
[2] Section 3.10.1

Static Pressures

Maximum static pressures within the PA61 project are calculated based on the Otay Mesa 680 Water Service Pressure Zone. Pad elevations onsite range from 524 feet to 532 feet. Using the maximum potential hydraulic gradeline of 680 feet, maximum static pressures within the project will range between 64 psi and 68 psi.

Existing and Proposed Water System

There are existing public water facilities directly adjacent to the PA61 project site. The existing facilities are part of the Otay Mesa 680 Zone. There is an existing 24-inch public water line in Otay Mesa Road adjacent to the project. The project will be connecting to this 24-inch line at one location. At this location, the "east" cul-de-sac, there is an existing stub in which the project will connect to.

The other private fire protection system connection will be made in Caliente Avenue along the western boundary of the project. Both private domestic system connections will be made at this location as well. Connecting to the existing 16-inch public line in Caliente Avenue ensures looping within the City water system.

The existing and proposed public water facilities in the vicinity of the project are shown on Figure 2 and a hydraulic control map is presented on Figure 3. The hydraulic control map shows existing water service areas and pressure zones in the vicinity of the proposed project.

Note that the two separate private domestic water systems (residential and commercial) will be established in parallel off Caliente Avenue with the onsite residential supply lateral being aligned through a private easement within the parking lot of the commercial area. The sizing of the private domestic water facilities will be under a separate report/study once final unit count and water fixture units are determined for the project.

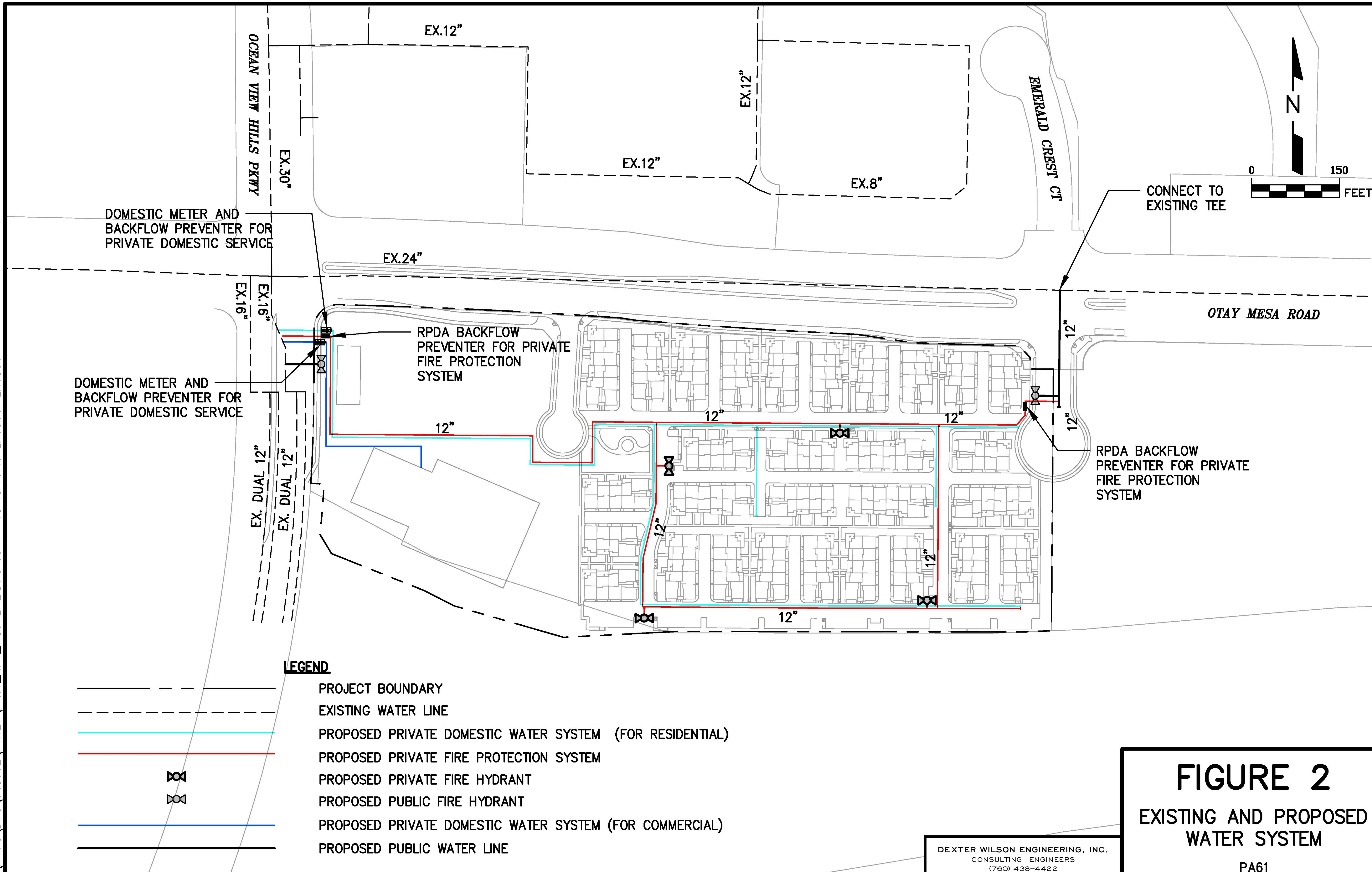

FIGURE 2

EXISTING AND PROPOSED WATER SYSTEM

PA61

\\ARTIC\DWG\648032\WATER\PA61_WAT_FIGURE-2.DWG 09-17-18 15:10:19 LAYOUT: LAYOUT

\\ARTIC\DWG\648032\PA61_WAT_FIGURE-3_HYDRO.DWG 04-13-18 14:12:16 LAYOUT: LAYOUT1

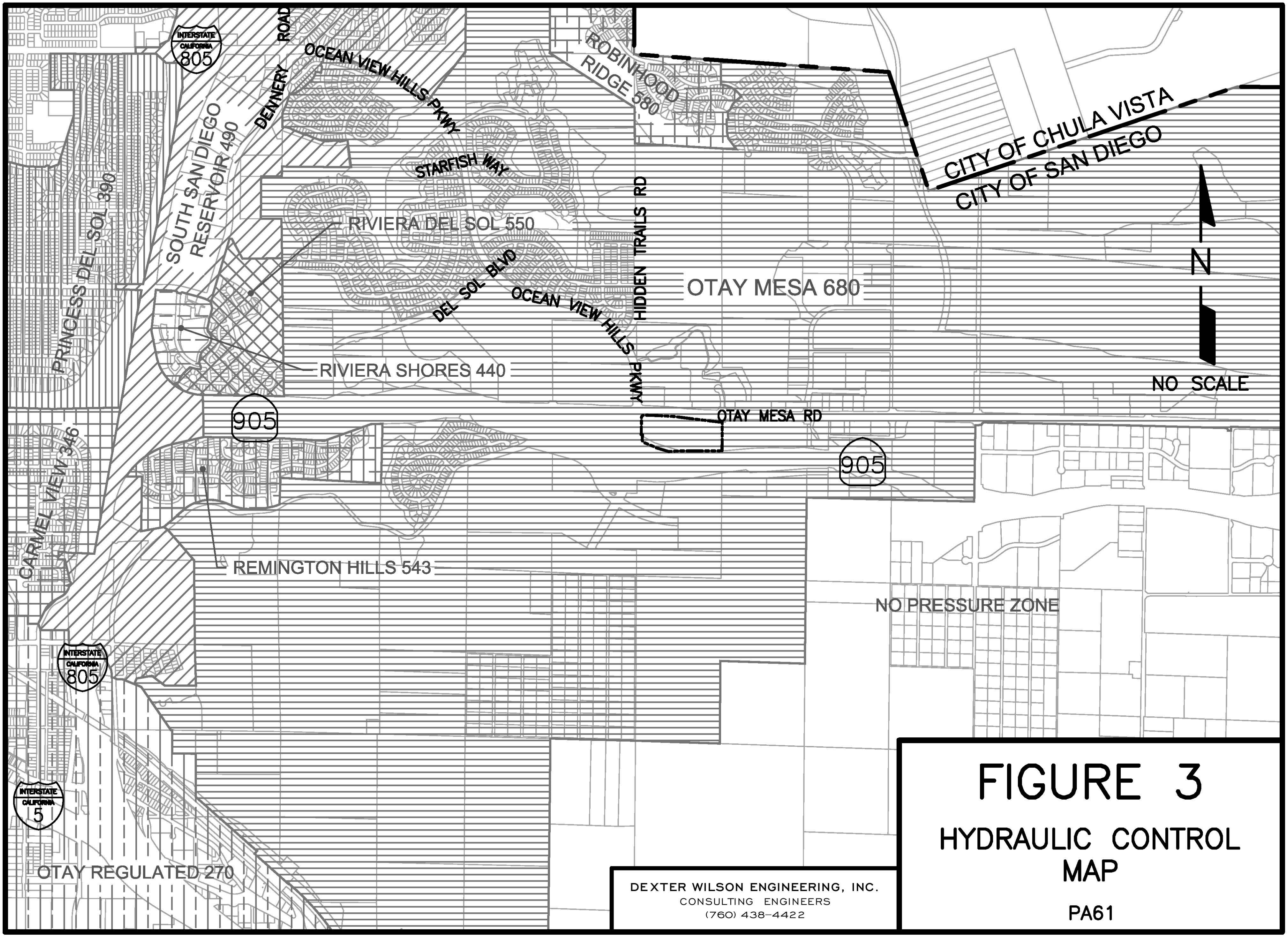

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FIGURE 3
HYDRAULIC CONTROL MAP
PA61

Water System Computer Model

The University of Kentucky KYPIPE computer program was used to conduct a hydraulic model of the proposed water system within the study area. This computer program utilizes the Hazen-Williams equation for determining headloss in pipes; the Hazen-Williams "C" value used for all pipes is 120.

The model for this analysis includes existing public and proposed public lines in the near vicinity of the project site. The hydraulic grade line (HGL) was determined by the results of the computer hydraulic modeling in the approved California Terraces Water Study (October 2003). Using the data provided by the peak hour and 3,000 gpm multi-family fire flow modeling scenarios in the approved study, an extrapolation calculation was done to determine the HGL at various flow values. The location of this hydraulic modeling node in the vicinity of the PA61 project is at the Ocean View Hills Boulevard and Hidden Trials Road intersection approximately 1,300 feet north of the project boundary.

Output from the approved California Terraces Water Study is included as Appendix C. Junction "6503" is the location of the node mentioned in the above paragraph.

This location also was chosen as the source ("0" Node) of the water model for this study. Making this modeling node the location of the water model source allows for a more accurate calculation of the HGL in the vicinity of the project. Utilizing the modeling data and extrapolation calculation described above, an HGL of 680 feet was determined for a static condition and an HGL of 670 feet was determined for a maximum day demand plus 4,000 gpm fire flow condition.

Water System Analysis and Results

Appendix D presents the computer modeling results and Exhibit A at the back of this report presents the corresponding Node and Pipe Diagram. The planning-level multi-family fire flow guideline of 3,000 gpm was modeled at the multi-family residential area at several locations within the project site. The planning-level commercial fire flow guideline of 4,000 gpm was modeled at both a designated node central within the commercial area and a proposed public hydrant adjacent to the commercial site. Pipe break scenarios were also modeled within the public water system.

Note that the maximum rated flow through a 10-inch RPDA backflow prevention device is approximately 3,500 gpm. The remaining 500 gpm in the 4,000 gpm total planning level commercial fire flow requirement is modeled at the proposed public hydrant along Caliente Avenue during the appropriate public pipe break scenario.

Under normal operating conditions (all pipes open) the planning-level fire flow of 3,000 gpm is being met with a minimum residual pressure of greater than 45 psi and a maximum pipeline velocity of 4.3 feet per second (fps) in the proposed 12-inch public water line in the "east" cul-de-sac. Under normal operating conditions the planning-level fire flow of 4,000 gpm is being met with a minimum residual pressure of greater than 42 psi and a maximum pipeline velocity of 5.6 fps in the proposed 12-inch public water line in the "east" cul-de-sac.

Under pipe break conditions, a fire flow of 3,000 gpm is being met with minimum residual pressures of greater than 38 psi and a maximum pipeline velocity of 8.5 fps and a fire flow of 4,000 gpm is being met with minimum residual pressures of greater than 37 psi and a maximum pipeline velocity of 9.9 fps.

The results of the computer hydraulic analyses for the PA61 project indicate that with the proposed connections off Caliente Avenue and the addition of a 12-inch public water main from the existing stub in Otay Mesa Road in the "east" cul-de-sac, the existing and proposed water system can provide sufficient flow and pressure for the PA61 projects' domestic and fire protection service needs.

Conclusions and Recommendations

The following conclusions and recommendations are summarized based on the water system analysis prepared for the PA61 project.

1. The PA61 project will be supplied from the Otay Mesa 680 Zone system.

2. Maximum static pressure within the residential project will range between 64 psi and 68 psi.

3. A maximum day demand plus 3,000 gpm and 4,000 gpm fire flow scenarios can be met at the project site with all residual pressures greater than 45 psi and 42 psi, respectively, and pipeline velocities less than 15 fps under all-pipes-open scenarios as well as under pipe break scenarios.

4. A preliminary analysis of the private onsite fire protection system and hydrants is included in this report. The private domestic water facilities will be under a separate report/study. These facilities are proposed to be private and separate from the City's public water system.

5. Figure 2 presents the existing and proposed water systems surrounding and within the project.

6. The recommended material specification for all new potable water lines is AWWA C900 PVC DR18 Class 235.

7. If any water lines to be constructed by this development are metallic, a California Licensed Corrosion Engineer will be required to perform a soil corrosivity study and to design a Corrosion Control System.

If you have any questions regarding the information or conclusions and recommendations presented in this report, please do not hesitate to call.

Dexter Wilson Engineering, Inc.

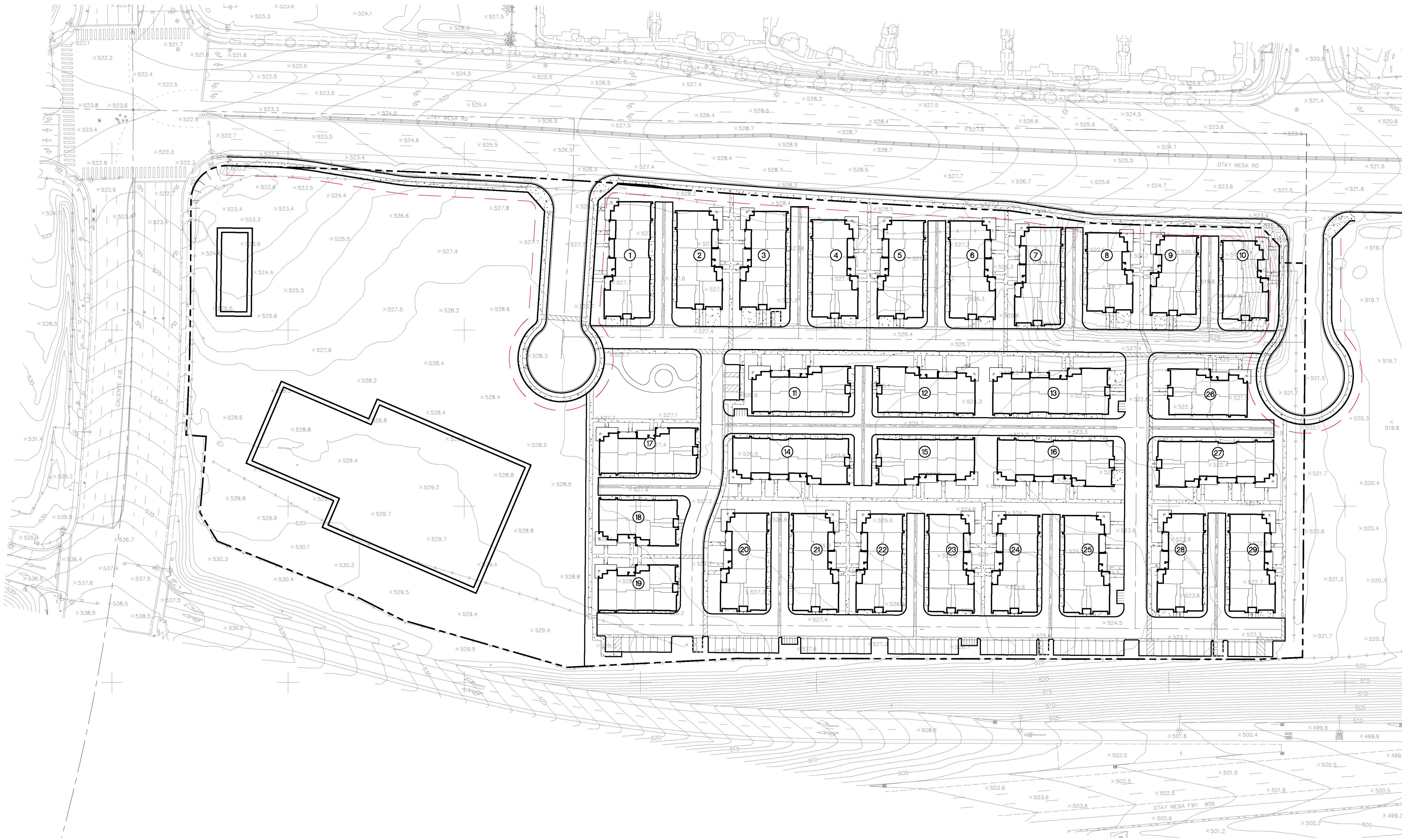
Steven J. Henderson, P.E.

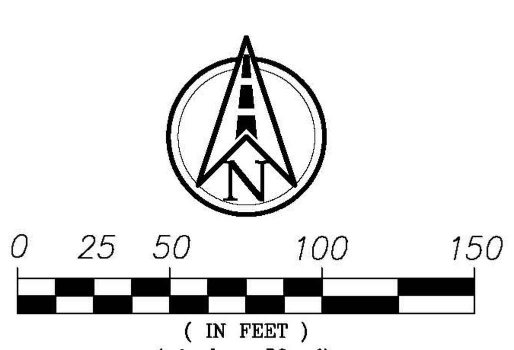
SH:AO:ps

Attachments

APPENDIX A

PA-61 CONCEPTUAL SITE PLAN





CALIFORNIA TERRACES - PA 61

OVERALL SITE PLAN

LAST REVISED JUNE 20, 2018

CIVIL SENSE INC
13475 Danielson Street, Suite 150
Poway, CA 92064

APPENDIX B

TABLE 2-1 IN THE CITY OF SAN DIEGO DESIGN GUIDELINES AND STANDARDS AND PEAKING FACTOR TABLES

Chapter 2

WATER DEMANDS AND SERVICE CRITERIA

2.1 General

This chapter outlines planning procedures to estimate water demands and fire flows. Water system service requirements are also defined in terms of water pressure and reservoir storage.

2.2 Service Area

The DESIGN CONSULTANT defines the project's service area and identifies the pressure zones in which it is located. The Senior Civil Engineer in charge of either Water Planning and Project Development, or Planning and Development Review Water Review Section, approves the service area boundaries.

2.3 Land Use and Residential Population

The DESIGN CONSULTANT develops present and future land use maps for the service area to define the following land use categories: residential (by zone in accordance with Table 2-1), central business district, commercial and institutional, parks, hospitals, hotels, industrial, office, and schools.

The DESIGN CONSULTANT estimates the residential population in the service area based on present and future allowable land use. Unless more accurate population density estimates are available, the residential population in the service area is estimated based on the figures presented in Table 2-1.

Table 2-1
Residential Population Density

Zone	Dwelling Unit Density (dwelling unit/net acre)	Unit Density (persons/dwelling unit)	Population Density (persons/net acre)
A-1-10	0.1	3.5	0.4
A-1-5	0.2	3.5	0.7
A-1-1	1	3.5	3.5
R-1-40	1	3.5	3.5
R-1-20	2	3.5	7.0
R-1-10	4	3.5	14
R-1-5	9	3.5	32
R-2	14	3.2	45
R-2A	29	3.0	87
R-3	43	2.6	112
R-3A	73	2.2	161
R-4	109	1.8	196
R-4C	218	1.5	327

Dwelling unit density in Table 2-1 is based on net area. The net area is measured in acres, and is 80% of the gross area for each residential zone.

2.4 Average Annual Water Demands

For most projects, average annual water demands are determined based on the unit water demand criteria presented in Table 2-2.

Table 2-2
Unit Water Demands

Land Use Category	Unit Water Demand
Residential	150 gallons/person-day
Central Business District	6000 gallons/net acre-day
Commercial and Institutional	5000 gallons/net acre-day
Fully Landscaped Park	4000 gallons/net acre-day
Hospitals	22500 gallons/net acre-day
Hotels	6555 gallons/net acre-day
Industrial	6250 gallons/net acre-day
Office	5730 gallons/net acre-day
Schools	4680 gallons/net acre-day

Average annual water demands are calculated as the sum of: (1) the residential water demand, and (2) other water demands for each land use category as follows:

Residential Water Demand (gallons/day) = Residential Population x 150 gallons/person-day

Other Water Demand (gallons/day) = Land Use Area by Category (net acres) x Unit Water Demand for Each Land Use Category (gallons/net acre-day)

Average Annual Water Demand (gallons/day) = Residential Water Demand + Other Water Demands

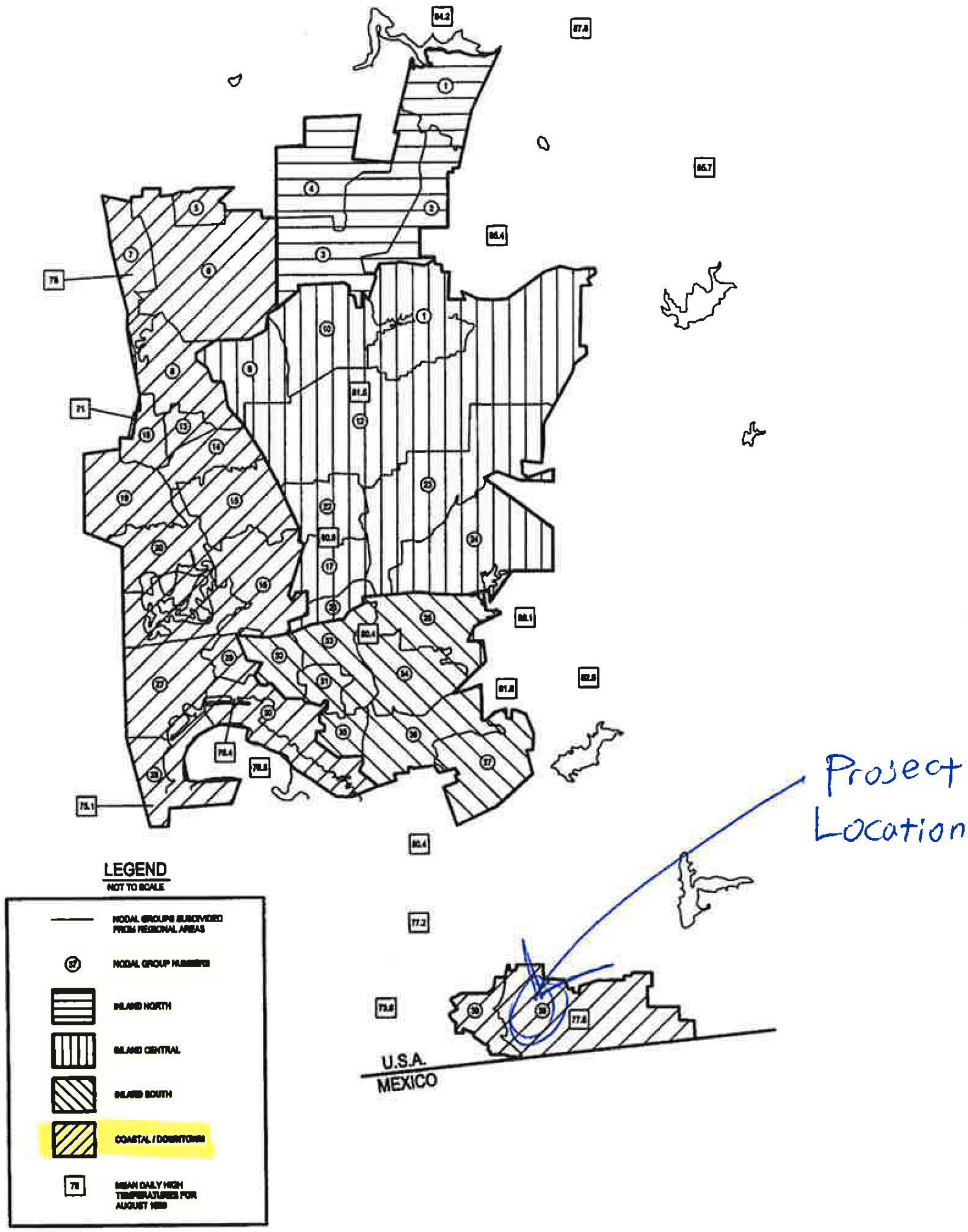
On some projects, particularly large residential developments, using the unit water demands in Table 2-2 may generate unrealistically high estimates of water requirements. For these large projects, the DESIGN CONSULTANT or developer may request that the CIP Project Manager consider an alternative approach, making use of the City's water demand distribution data developed for macroscale planning purposes. Similarly, the CIP Project Manager may also consider alternative unit water demand estimates for specific land use types where such estimates are based on detailed demand evaluations.

2.5 Peak Water Demands

Unless the project involves a large development that calls for an alternative approach, peak hour and maximum day water demands are estimated using the peaking factors presented in Figures 2-1 and 2-2. These peaking factors correspond to the zones identified in Figure 2-3.

PEAKING FACTOR ZONES
(BOUNDARIES BASED ON LAND USE GROUPINGS)

FIGURE 2-3



July 1999

FIGURE 2-2
MAXIMUM DAY DEMAND FACTOR

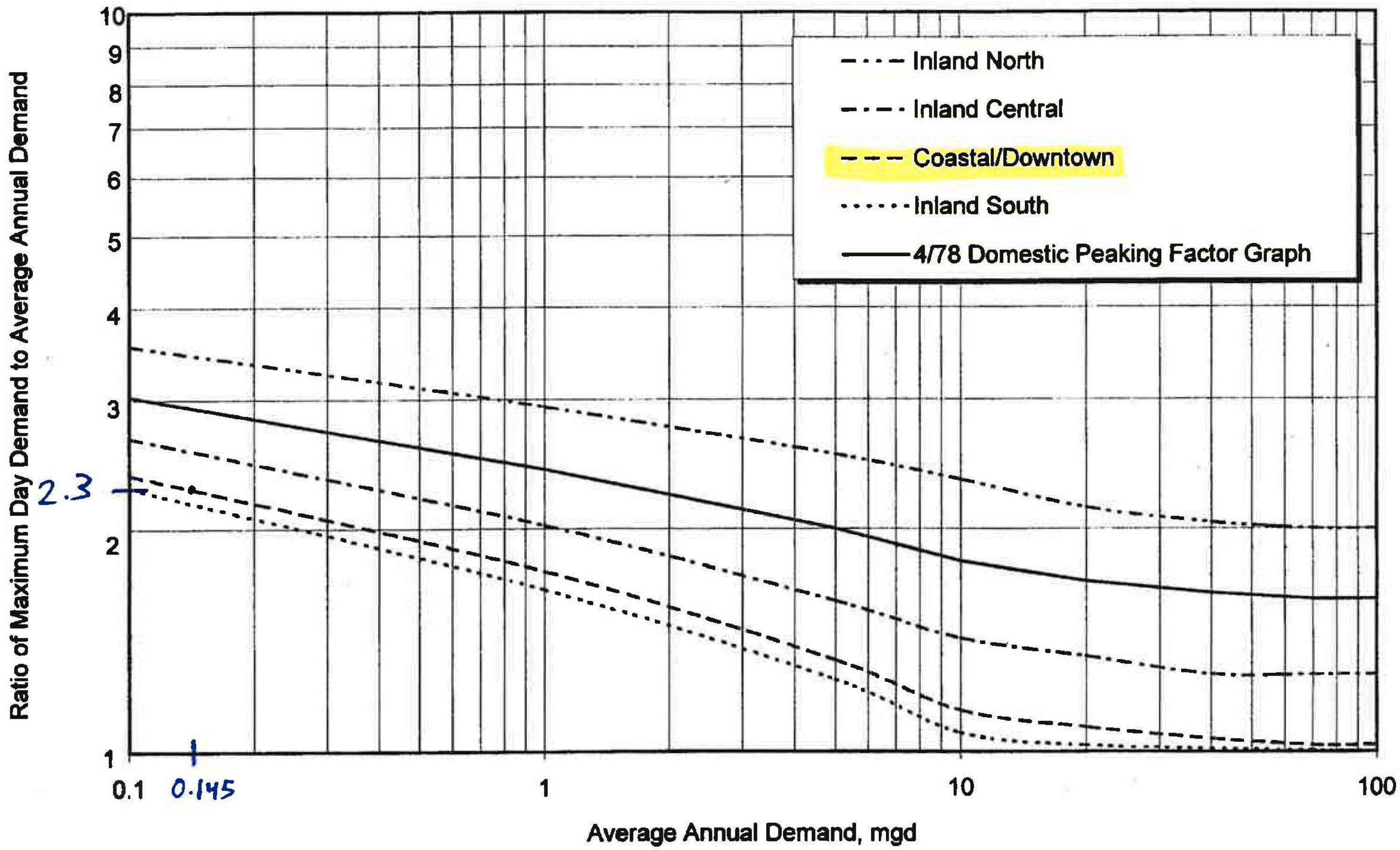
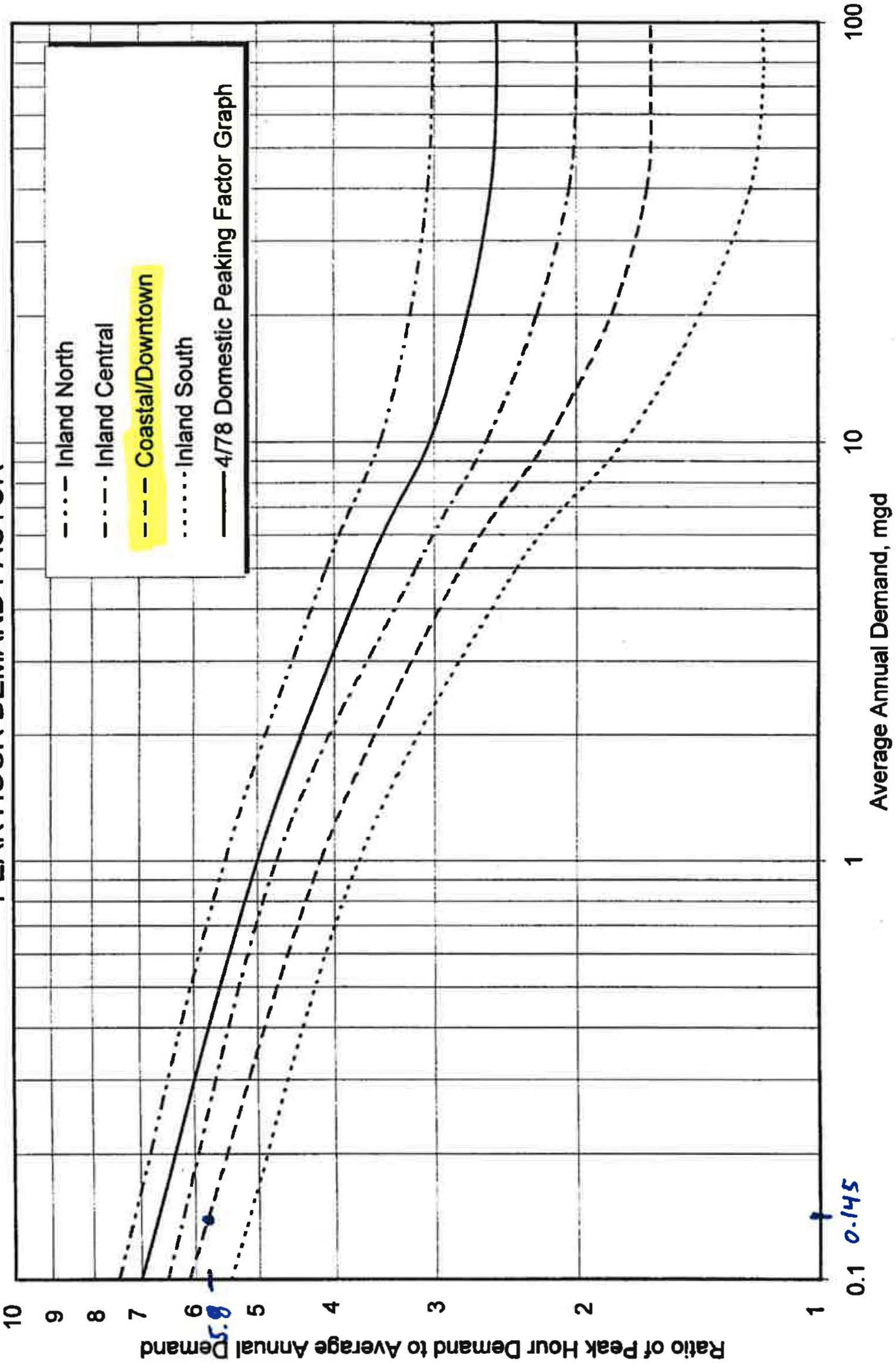


FIGURE 2-1
PEAK HOUR DEMAND FACTOR



APPENDIX C

HYDRAULIC COMPUTER MODELING OUTPUT FROM APPROVED CALIFORNIA TERRACES WATER STUDY (OCTOBER 2003)

TABLE B-1A
PEAK HOUR

NODE No.	ELEVATION (ft)	HGL ZONE (ft)	STATIC PRESSURE (psi)	MODEL PRESSURE (psi)	ΔPRESSURE FROM STATIC (psi)
1454	525	680	67	48	19
202	512	680	73	54	19
204	490	680	82	63	19
206	440	680	104	85	19
208	490	680	82	63	19
210	494	680	81	62	19
212	504	680	76	57	19
214	514	680	72	53	19
216	515	680	71	52	19
218	519	680	70	51	19
220	518	680	70	51	19
222	526	680	67	48	19
224	505	680	76	57	19
226	515	680	71	53	19
228	517	680	71	52	19
229	505	680	76	57	19
230	494	680	81	62	19
232	497	680	79	61	19
234	507	680	75	56	19
236	504	680	76	57	19
238	501	680	77	59	19
240	496	680	80	61	19
242	497	680	79	60	19
244	464	680	94	75	19
246	495	680	80	61	19
248	490	680	82	63	19
250	500	680	78	59	19
252	499	680	78	59	19
254	495	680	80	61	19
256	499	680	78	59	19
258	502	680	77	58	19
260	502	680	77	58	19
262	507	680	75	56	19
264	506	680	75	56	19
266	503	680	77	57	19
268	502	680	77	58	19
270	493	680	81	62	19
272	514	680	72	52	19
274	491	680	82	62	19
276	492	680	81	62	19
278	486	680	84	65	19
280	480	680	87	67	19
282	483	680	85	66	19
284	504	680	76	57	19
286	498	680	79	60	19
288	500	680	78	59	19
290	512	680	73	54	19
292	505	680	76	57	19
294	523	680	68	49	19

NODE No.	ELEVATION (ft)	HGL ZONE (ft)	STATIC PRESSURE (psi)	MODEL PRESSURE (psi)	ΔPRESSURE FROM STATIC (psi)
296	508	680	74	56	19
298	523	680	68	49	19
300	504	680	76	57	19
302	512	680	73	54	19
304	515	680	71	53	19
306	523	680	68	49	19
308	522	680	68	50	19
310	525	680	67	48	19
312	528	680	66	47	19
314	515	680	71	53	19
316	518	680	70	51	19
318	521	680	69	50	19
320	519	680	70	51	19
322	517	680	71	52	19
326	524	680	68	49	19
328	521	680	69	50	19
330	523	680	68	49	19
4002	382	680	129	110	19
4004	387	680	127	108	19
2A 4006	389	680	126	107	19
4008	392	680	125	106	19
4010	379	680	130	112	19
4012	511	680	73	54	19
4014	523	680	68	49	19
4016	522	680	68	49	19
4018	520	680	69	50	19
4026	519	680	70	51	19
4032	525	680	67	48	19
4034	527	680	66	47	19
4036	529	680	65	46	19
4038	531	680	65	45	20
4040	524	680	68	48	20
4042	522	680	68	49	20
4044	530	680	65	46	19
4046	533	680	64	45	19
4048	521	680	69	49	20
4050	520	680	69	50	19
4052	526	680	67	48	19
4054	535	680	63	44	19
4056	528	680	66	47	19
4058	534	680	63	44	19
4060	526	680	67	48	19
4062	530	680	65	46	19
4064	526	680	67	48	19
4066	527	680	66	47	19
4068	440	680	104	85	19
4070	528	680	66	47	19
6503	521	680	69	50	19
700	472	680	90	71	19
702	480	680	87	68	19
704	484	680	85	66	19
706	486	680	84	65	19

NODE No.	ELEVATION (ft)	HGL ZONE (ft)	STATIC PRESSURE (psi)	MODEL PRESSURE (psi)	ΔPRESSURE FROM STATIC (psi)
708	493	680	81	62	19
710	478	680	87	69	19
712	491	680	82	63	19
714	490	680	82	63	19
716	498	680	79	60	19
718	500	680	78	59	19
720	505	680	76	57	19
722	512	680	73	54	19
724	515	680	71	53	19
726	514	680	72	53	19
728	497	680	79	60	19
730	520	680	69	51	19
732	521	680	69	50	19
801	360	680	139	120	19
802	332	490	68	58	10
803	330	490	69	59	10
804	328	490	70	60	10
805	351	680	142	124	19
806	356	680	140	122	19
807	364	680	137	118	19
808	350	680	143	124	19
809	360	680	139	120	19
810	365	680	136	118	19
811	360	680	139	120	19
812	370	680	134	115	19
813	370	680	134	115	19
814	375	680	132	113	19
815	357	680	140	121	19
816	370	680	134	115	19
817	376	680	132	113	19
818	370	680	134	115	19
819	327	490	71	60	10
825	520	680	69	51	19
826	522	680	68	50	19
827	511	680	73	55	19
828	499	680	78	60	19
829	472	680	90	71	19
830	468	680	92	73	19
832	400	680	121	103	19
850	370	680	134	115	19

2A

TABLE B-1B
PEAK HOUR

PIPE No.	DIAMETER (in)	FLOW (gpm)	VELOCITY (fps)
1002	30	-1637.64	0.74
200	16	-673.84	1.08
202	16	623.87	1.00
204	16	256.13	0.41
206	12	40.85	0.12
208	12	-333.12	0.94
210	12	-306.55	0.87
212	8	-24.28	0.16
214	8	76.42	0.49
216	8	-43.67	0.28
218	12	-318.26	0.90
220	8	-86.13	0.55
222	8	9.68	0.06
224	8	-102.73	0.66
226	8	16.63	0.11
228	8	-137.36	0.88
229	12	-257.06	0.73
230	12	-250.15	0.71
231	30	-159.62	0.07
232	8	-120.60	0.77
234	8	-23.22	0.15
236	8	9.68	0.06
238	8	-60.59	0.39
240	12	-210.44	0.60
242	8	-32.72	0.21
244	12	-211.23	0.60
246	12	-257.81	0.73
248	12	-98.56	0.28
250	8	13.86	0.09
252	12	133.19	0.38
254	8	9.68	0.06
256	12	-162.24	0.46
258	8	11.09	0.07
260	12	-198.28	0.56
262	8	13.86	0.09
264	12	-87.63	0.25
266	8	17.02	0.11
268	12	52.18	0.15
270	12	12.47	0.04
272	12	47.28	0.13
274	12	-77.06	0.22
276	12	65.92	0.19
278	12	28.85	0.08
280	12	-61.91	0.18
282	12	-111.40	0.32
284	12	-154.08	0.44
286	8	19.85	0.13
288	8	21.27	0.14
290	8	9.93	0.06
292	12	-155.74	0.44

PIPE No.	DIAMETER (in)	FLOW (gpm)	VELOCITY (fps)
294	8	11.35	0.07
296	8	17.02	0.11
298	8	21.13	0.13
300	8	29.92	0.19
302	8	17.15	0.11
304	8	9.92	0.06
306	8	7.09	0.05
308	8	43.96	0.28
312	8	4.26	0.03
314	8	28.36	0.18
316	8	11.35	0.07
318	8	7.09	0.05
320	8	194.69	1.24
322	8	6.91	0.04
324	8	165.64	1.06
326	8	6.91	0.04
328	8	121.52	0.78
330	8	11.09	0.07
332	8	96.57	0.62
334	8	55.14	0.35
336	8	6.91	0.04
338	8	24.69	0.16
340	8	-36.22	0.23
342	8	-108.33	0.69
344	8	-137.74	0.88
346	8	179.28	1.14
348	8	11.09	0.07
350	8	-9.68	0.06
352	8	12.35	0.08
354	8	-26.42	0.17
356	16	-27.49	0.04
358	24	198.32	0.14
4002	8	65.65	0.42
4004	8	12.86	0.08
4006	8	22.23	0.14
4008	8	12.86	0.08
4010	8	-3.48	0.02
4012	8	17.71	0.11
4014	8	1.37	0.01
4016	16	-818.06	1.31
4018	8	144.21	0.92
4020	8	127.49	0.81
4022	8	50.17	0.32
4030	8	6.31	0.04
4036	16	713.98	1.14
4038	16	-695.65	1.11
4040	12	741.47	2.10
4042	8	291.67	1.86
4044	8	90.30	0.58
4046	8	-111.08	0.71
4048	8	248.43	1.59
4050	8	245.60	1.57
4052	12	668.15	1.90

PIPE No.	DIAMETER (in)	FLOW (gpm)	VELOCITY (fps)
4054	8	-198.55	1.27
4056	8	268.23	1.71
4058	8	66.85	0.43
4060	12	350.09	0.99
4062	12	433.67	1.23
4064	12	323.42	0.92
4066	12	338.08	0.96
4068	12	-100.63	0.29
4070	12	313.79	0.89
4072	12	93.29	0.26
4076	8	47.23	0.30
4077	8	63.02	0.40
4078	8	-57.97	0.37
4079	12	12.01	0.03
4080	8	69.23	0.44
4082	12	6.50	0.02
4084	24	40.37	0.03
4086	12	50.96	0.14
4090	16	-328.52	0.52
4092	8	-43.86	0.28
4094	12	237.46	0.67
4096	8	41.02	0.26
427	24	-1675.46	1.19
700	16	337.38	0.54
702	12	179.15	0.51
704	24	326.50	0.23
706	24	249.03	0.18
708	12	155.28	0.44
710	8	70.25	0.45
712	8	13.98	0.09
714	8	32.51	0.21
716	8	9.78	0.06
718	8	20.58	0.13
720	8	47.14	0.30
722	8	8.39	0.05
724	12	76.50	0.22
726	12	-71.04	0.20
728	12	38.97	0.11
730	12	69.72	0.20
732	8	19.57	0.12
734	8	11.18	0.07
736	12	-128.44	0.36
801	12	17.06	0.05
802	8	11.81	0.08
803	8	-3.94	0.03
804	8	-4.59	0.03
806	8	-19.93	0.13
807	8	-40.44	0.26
808	12	-150.61	0.43
810	8	7.41	0.05
811	8	9.57	0.06
812	12	-103.34	0.29
813	8	-10.47	0.07

PIPE No.	DIAMETER (in)	FLOW (gpm)	VELOCITY (fps)
814	8	-36.44	0.23
815	8	36.02	0.23
816	8	13.67	0.09
817	8	-70.63	0.45
818	12	-13.87	0.04
819	8	10.94	0.07
820	8	61.99	0.40
821	8	53.79	0.34
822	8	92.50	0.59
823	8	140.62	0.90
825	30	-3011.60	1.37
826	30	746.06	0.34
827	30	-416.69	0.19
828	30	-693.25	0.31
829	30	-891.53	0.40
830	30	914.03	0.41
831	12	-218.86	0.62
852	12	-140.62	0.40

TABLE B-3A
MAX DAY + MF FIRE (4058, 4062) W/ 8" MAIN (p4076) OOS

NODE No.	ELEVATION (ft)	HGL ZONE (ft)	STATIC PRESSURE (psi)	MODEL PRESSURE (psi)	ΔPRESSURE FROM STATIC (psi)
1454	525	680	67	64	3
202	512	680	73	70	3
204	490	680	82	79	3
206	440	680	104	101	3
208	490	680	82	79	3
210	494	680	81	78	3
212	504	680	76	73	3
214	514	680	72	69	3
216	515	680	71	68	3
218	519	680	70	67	3
220	518	680	70	67	3
222	526	680	67	64	3
224	505	680	76	73	3
226	515	680	71	68	3
228	517	680	71	68	3
229	505	680	76	73	3
230	494	680	81	78	3
232	497	680	79	77	3
234	507	680	75	72	3
236	504	680	76	73	3
238	501	680	77	75	3
240	496	680	80	77	3
242	497	680	79	76	3
244	464	680	94	91	3
246	495	680	80	77	3
248	490	680	82	80	3
250	500	680	78	75	3
252	499	680	78	75	3
254	495	680	80	77	3
256	499	680	78	75	3
258	502	680	77	74	3
260	502	680	77	74	3
262	507	680	75	72	3
264	506	680	75	72	3
266	503	680	77	73	3
268	502	680	77	74	3
270	493	680	81	78	3
272	514	680	72	69	3
274	491	680	82	79	3
276	492	680	81	78	3
278	486	680	84	81	3
280	480	680	87	84	3
282	483	680	85	82	3
284	504	680	76	73	3
286	498	680	79	76	3
288	500	680	78	75	3
290	512	680	73	70	3
292	505	680	76	73	3
294	523	680	68	65	3

NODE No.	ELEVATION (ft)	HGL ZONE (ft)	STATIC PRESSURE (psi)	MODEL PRESSURE (psi)	ΔPRESSURE FROM STATIC (psi)
296	508	680	74	71	3
298	523	680	68	65	3
300	504	680	76	73	3
302	512	680	73	70	3
304	515	680	71	68	3
306	523	680	68	65	3
308	522	680	68	65	3
310	525	680	67	64	3
312	528	680	66	63	3
314	515	680	71	68	3
316	518	680	70	67	3
318	521	680	69	66	3
320	519	680	70	67	3
322	517	680	71	67	3
326	524	680	68	64	3
328	521	680	69	66	3
330	523	680	68	65	3
4002	382	680	129	127	2
4004	387	680	127	124	2
4006	389	680	126	124	2
4008	392	680	125	122	2
4010	379	680	130	128	2
4012	511	680	73	70	3
4014	523	680	68	65	3
4016	522	680	68	65	3
4018	520	680	69	66	3
4026	519	680	70	67	3
4032	525	680	67	64	3
4034	527	680	66	63	3
4036	529	680	65	62	3
4038	531	680	65	61	3
4040	524	680	68	64	3
4042	522	680	68	65	3
4044	530	680	65	62	3
4046	533	680	64	60	3
4048	521	680	69	65	3
4050	520	680	69	64	6
4052	526	680	67	61	5
4054	535	680	63	57	6
4056	528	680	66	60	6
4058	534	680	63	55	9
4060	526	680	67	60	7
4062	530	680	65	44	21
4064	526	680	67	58	8
4066	527	680	66	59	8
4068	440	680	104	101	3
4070	528	680	66	60	6
6503	521	680	69	66	3
700	472	680	90	87	3
702	480	680	87	83	3
704	484	680	85	82	3
706	486	680	84	81	3

NODE No.	ELEVATION (ft)	HGL ZONE (ft)	STATIC PRESSURE (psi)	MODEL PRESSURE (psi)	ΔPRESSURE FROM STATIC (psi)
708	493	680	81	78	3
710	478	680	87	84	3
712	491	680	82	79	3
714	490	680	82	79	3
716	498	680	79	76	3
718	500	680	78	75	3
720	505	680	76	72	3
722	512	680	73	70	3
724	515	680	71	68	3
726	514	680	72	69	3
728	497	680	79	76	3
730	520	680	69	66	3
732	521	680	69	66	3
801	360	680	139	136	2
802	332	490	68	61	7
803	330	490	69	62	7
804	328	490	70	63	7
805	351	680	142	140	2
806	356	680	140	138	2
807	364	680	137	134	2
808	350	680	143	141	2
809	360	680	139	136	2
810	365	680	136	134	2
811	360	680	139	136	2
812	370	680	134	132	2
813	370	680	134	132	2
814	375	680	132	130	2
815	357	680	140	137	2
816	370	680	134	132	2
817	376	680	132	129	2
818	370	680	134	132	2
819	327	490	71	64	7
825	520	680	69	66	3
826	522	680	68	65	3
827	511	680	73	70	3
828	499	680	78	76	3
829	472	680	90	87	3
830	468	680	92	89	3
832	400	680	121	119	2
850	370	680	134	132	2

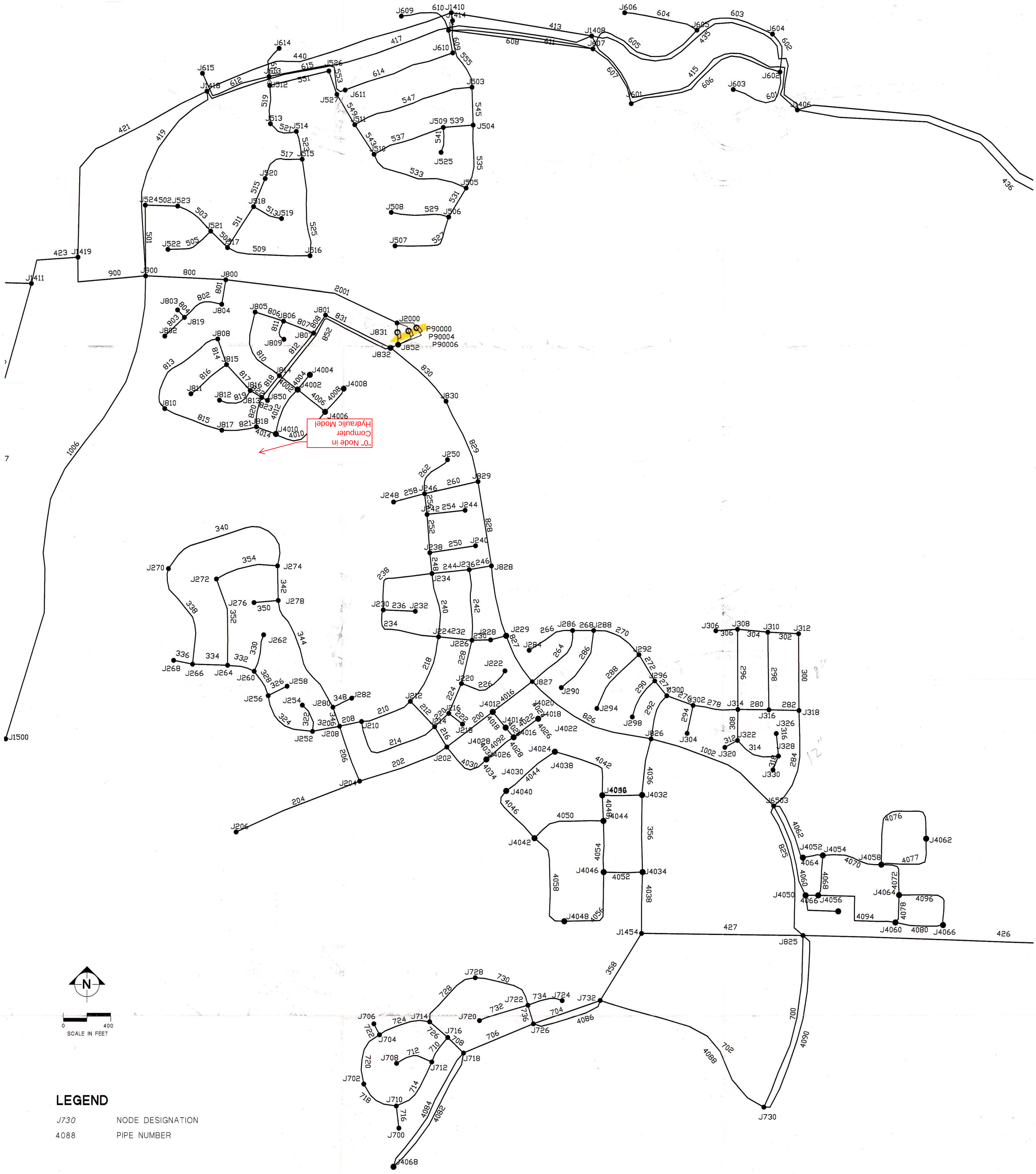
TABLE B-3B
MAX DAY + MF FIRE (4058, 4062) W/ 8" MAIN (p4076) OOS

PIPE No.	DIAMETER (in)	FLOW (gpm)	VELOCITY (fps)
1002	30	2389.30	1.08
200	16	-199.10	0.32
202	16	248.79	0.40
204	16	122.94	0.20
206	12	-31.06	0.09
208	12	-210.56	0.60
210	12	-198.07	0.56
212	8	52.74	0.34
214	8	36.43	0.23
216	8	68.53	0.44
218	12	-268.09	0.76
220	8	-66.18	0.42
222	8	4.65	0.03
224	8	-74.14	0.47
226	8	7.98	0.05
228	8	-90.76	0.58
229	12	37.70	0.11
230	12	41.02	0.12
231	30	-3456.50	1.57
232	8	44.79	0.29
234	8	-50.93	0.33
236	8	4.65	0.03
238	8	-68.87	0.44
240	12	-279.23	0.79
242	8	-98.95	0.63
244	12	-68.11	0.19
246	12	-173.71	0.49
248	12	-298.59	0.85
250	8	6.65	0.04
252	12	315.22	0.89
254	8	4.65	0.03
256	12	-329.16	0.93
258	8	5.32	0.03
260	12	-346.46	0.98
262	8	6.65	0.04
264	12	-248.75	0.71
266	8	8.17	0.05
268	12	231.73	0.66
270	12	212.67	0.60
272	12	-183.99	0.52
274	12	169.70	0.48
276	12	182.56	0.52
278	12	164.77	0.47
280	12	103.20	0.29
282	12	76.56	0.22
284	12	74.96	0.21
286	8	9.53	0.06
288	8	10.21	0.07
290	8	4.76	0.03
292	12	-18.99	0.05

PIPE No.	DIAMETER (in)	FLOW (gpm)	VELOCITY (fps)
294	8	5.45	0.03
296	8	24.17	0.15
298	8	13.02	0.08
300	8	-4.52	0.03
302	8	-10.64	0.07
304	8	-11.23	0.07
306	8	3.40	0.02
308	8	23.11	0.15
312	8	2.04	0.01
314	8	13.61	0.09
316	8	5.45	0.03
318	8	3.40	0.02
320	8	93.45	0.60
322	8	3.32	0.02
324	8	79.51	0.51
326	8	3.32	0.02
328	8	58.33	0.37
330	8	5.32	0.03
332	8	46.36	0.30
334	8	26.47	0.17
336	8	3.32	0.02
338	8	11.85	0.08
340	8	-17.39	0.11
342	8	-52.00	0.33
344	8	-66.11	0.42
346	8	86.06	0.55
348	8	5.32	0.03
350	8	-4.65	0.03
352	8	5.93	0.04
354	8	-12.68	0.08
356	16	176.13	0.28
358	24	120.88	0.09
4002	8	31.51	0.20
4004	8	6.17	0.04
4006	8	10.67	0.07
4008	8	6.17	0.04
4010	8	-1.67	0.01
4012	8	8.50	0.05
4014	8	0.66	0.00
4016	16	-252.51	0.40
4018	8	53.41	0.34
4020	8	45.39	0.29
4022	8	24.08	0.15
4030	8	18.84	0.12
4036	16	536.46	0.86
4038	16	-140.16	0.22
4040	12	360.33	1.02
4042	8	140.78	0.90
4044	8	44.12	0.28
4046	8	-52.54	0.34
4048	8	122.89	0.78
4050	8	118.13	0.75
4052	12	316.29	0.90

PIPE No.	DIAMETER (in)	FLOW (gpm)	VELOCITY (fps)
4054	8	-91.90	0.59
4056	8	127.74	0.82
4058	8	31.08	0.20
4060	12	1550.34	4.40
4062	12	1832.11	5.20
4064	12	1779.19	5.05
4066	12	1538.33	4.36
4068	12	-448.85	1.27
4070	12	2175.12	6.17
4072	12	-930.72	2.64
4076	8	0.00	0.00
4077	8	1552.92	9.91
4078	8	-687.91	4.39
4079	12	12.01	0.03
4080	8	348.65	2.23
4082	12	3.27	0.01
4084	24	19.23	0.01
4086	12	24.46	0.07
4090	16	-145.01	0.23
4092	8	-5.25	0.03
4094	12	1089.48	3.09
4096	8	-295.73	1.89
427	24	-636.16	0.45
700	16	148.93	0.24
702	12	60.30	0.17
704	24	156.72	0.11
706	24	119.53	0.08
708	12	74.53	0.21
710	8	33.72	0.22
712	8	6.71	0.04
714	8	15.60	0.10
716	8	4.70	0.03
718	8	9.88	0.06
720	8	22.63	0.14
722	8	4.03	0.03
724	12	36.72	0.10
726	12	-34.10	0.10
728	12	18.70	0.05
730	12	33.47	0.09
732	8	9.39	0.06
734	8	5.37	0.03
736	12	-61.65	0.17
801	12	11.38	0.03
802	8	7.88	0.05
803	8	-2.63	0.02
804	8	-3.06	0.02
806	8	-9.57	0.06
807	8	-19.41	0.12
808	12	-72.29	0.21
810	8	3.56	0.02
811	8	4.59	0.03
812	12	-49.60	0.14
813	8	-5.02	0.03

PIPE No.	DIAMETER (in)	FLOW (gpm)	VELOCITY (fps)
814	8	-17.49	0.11
815	8	17.29	0.11
816	8	6.56	0.04
817	8	-33.90	0.22
818	12	-6.66	0.02
819	8	5.25	0.03
820	8	29.76	0.19
821	8	25.82	0.16
822	8	44.40	0.28
823	8	67.50	0.43
825	30	-1127.53	0.51
826	30	-2955.24	1.34
827	30	-3418.80	1.55
828	30	-3601.51	1.63
829	30	-3947.97	1.79
830	30	3958.77	1.80
831	12	-105.05	0.30
852	12	-67.50	0.19



N

0 400
SCALE IN FEET

LEGEND

J730	NODE DESIGNATION
4088	PIPE NUMBER

PIPE AND NODE MAP

EXHIBIT B-1

NOTE: SEE FIGURE 2 FROM THE OTAY CORPORATE CENTER NORTH WATER STUDY ADDENDUM (JANUARY 2001) AND EXHIBIT 1 FROM THE CALIFORNIA TERRACES WATER STUDY (JUNE 1998) FOR THE SSD/OTAY MESA WATER SYSTEM PIPE AND NODE MAP.

H:\Waterres\072\491029\October 2003\pipe node.dwg October 24, 2003

APPENDIX D

COMPUTER MODELING OUTPUT

The following conditions were modeled:

1. Average Day Demand.

2. Peak Hour Demand.

3. Maximum Day Demand plus 3,000 gpm Fire Flow split between Nodes 114 and 122.

4. Maximum Day Demand plus 3,000 gpm Fire Flow split between Nodes 126 and 134.

5. Maximum Day Demand plus 4,000 gpm Fire Flow at Node 110.

6. Maximum Day Demand plus 3,000 gpm Fire Flow split between Nodes 126 and 134. Pipe 41 closed.

7. Maximum Day Demand plus 3,000 gpm Fire Flow split between Nodes 118 and 122. Pipe 39 closed.

8. Maximum Day Demand plus 4,000 gpm Fire Flow; 3,500 gpm at Node 110 and 500 gpm at Node 32. Pipe 41 closed.

9. Maximum Day Demand plus 4,000 gpm Fire Flow at Node 110. Pipe 39 closed.

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: All Pipes Open - Average Day Demand

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
4	533	680	63.69	63.7	-0.01
8	535	680	62.82	62.83	-0.01
12	548	680	57.19	57.2	-0.01
16	527	680	66.29	66.3	-0.01
20	544	680	58.93	58.93	0.00
24	544	680	58.93	58.93	0.00
28	548	680	57.19	57.2	-0.01
32	539	680	61.09	61.1	-0.01
36	534	680	63.26	63.27	-0.01
40	526	680	66.72	66.73	-0.01
102	532	680	64.12	64.13	-0.01
106	532	680	64.12	64.13	-0.01
110	530	680	64.99	65	-0.01
114	530	680	64.99	65	-0.01
118	530	680	64.99	65	-0.01
122	530	680	64.99	65	-0.01
126	528	680	65.86	65.87	-0.01
130	528	680	65.86	65.87	-0.01
134	528	680	65.86	65.87	-0.01
138	528	680	65.86	65.87	-0.01

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Peak Hour Demand

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
4	533	680	63.69	44.19	19.50
8	535	680	62.82	43.33	19.49
12	548	680	57.19	37.69	19.50
16	527	680	66.29	46.79	19.50
20	544	680	58.93	39.42	19.51
24	544	680	58.93	39.42	19.51
28	548	680	57.19	37.69	19.50
32	539	680	61.09	41.58	19.51
36	534	680	63.26	43.75	19.51
40	526	680	66.72	47.23	19.49
102	532	680	64.12	44.62	19.50
106	532	680	64.12	44.62	19.50
110	530	680	64.99	45.49	19.50
114	530	680	64.99	45.49	19.50
118	530	680	64.99	45.49	19.50
122	530	680	64.99	45.49	19.50
126	528	680	65.86	46.35	19.51
130	528	680	65.86	46.36	19.50
134	528	680	65.86	46.35	19.51
138	528	680	65.86	46.36	19.50

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 3000 gpm Fire Flow split between Nodes 114 and 122

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
4	533	680	63.69	60.93	2.76
8	535	680	62.82	60.06	2.76
12	548	680	57.19	54.4	2.79
16	527	680	66.29	63.43	2.86
20	544	680	58.93	56.13	2.80
24	544	680	58.93	56.13	2.80
28	548	680	57.19	54.39	2.80
32	539	680	61.09	58.27	2.82
36	534	680	63.26	60.43	2.83
40	526	680	66.72	63.34	3.38
102	532	680	64.12	61.19	2.93
106	532	680	64.12	46.44	17.68
110	530	680	64.99	45.98	19.01
114	530	680	64.99	45.45	19.54
118	530	680	64.99	45.37	19.62
122	530	680	64.99	45.18	19.81
126	528	680	65.86	46.44	19.42
130	528	680	65.86	46.7	19.16
134	528	680	65.86	46.57	19.29
138	528	680	65.86	47.11	18.75

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 3000 gpm Fire Flow split between Nodes 126 and 134

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
4	533	680	63.69	60.93	2.76
8	535	680	62.82	60.06	2.76
12	548	680	57.19	54.4	2.79
16	527	680	66.29	63.43	2.86
20	544	680	58.93	56.13	2.80
24	544	680	58.93	56.13	2.80
28	548	680	57.19	54.39	2.80
32	539	680	61.09	58.27	2.82
36	534	680	63.26	60.43	2.83
40	526	680	66.72	63.33	3.39
102	532	680	64.12	61.2	2.92
106	532	680	64.12	46.7	17.42
110	530	680	64.99	46.26	18.73
114	530	680	64.99	45.74	19.25
118	530	680	64.99	45.68	19.31
122	530	680	64.99	45.53	19.46
126	528	680	65.86	46.1	19.76
130	528	680	65.86	46.42	19.44
134	528	680	65.86	46.31	19.55
138	528	680	65.86	46.84	19.02

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 4000 gpm Fire Flow at Node 110

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
4	533	680	63.69	59.09	4.60
8	535	680	62.82	58.22	4.60
12	548	680	57.19	52.54	4.65
16	527	680	66.29	61.52	4.77
20	544	680	58.93	54.27	4.66
24	544	680	58.93	54.26	4.67
28	548	680	57.19	52.52	4.67
32	539	680	61.09	56.38	4.71
36	534	680	63.26	58.55	4.71
40	526	680	66.72	61.1	5.62
102	532	680	64.12	59.23	4.89
106	532	680	64.12	43.76	20.36
110	530	680	64.99	42.26	22.73
114	530	680	64.99	43.16	21.83
118	530	680	64.99	43.23	21.76
122	530	680	64.99	43.43	21.56
126	528	680	65.86	44.69	21.17
130	528	680	65.86	44.95	20.91
134	528	680	65.86	44.63	21.23
138	528	680	65.86	45.62	20.24

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 3000 gpm Fire Flow split between Nodes 126 and 134
Pipe 41 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
4	533	680	63.69	60.93	2.76
8	535	680	62.82	60.05	2.77
12	548	680	57.19	54.34	2.85
16	527	680	66.29	63.53	2.76
20	544	680	58.93	56.06	2.87
24	544	680	58.93	56.05	2.88
28	548	680	57.19	54.3	2.89
32	539	680	61.09	58.13	2.96
36	534	680	63.26	60.29	2.97
40	526	680	66.72	39.51	27.21
102	532	680	64.12	60.76	3.36
106	532	680	64.12	45.11	19.01
110	530	680	64.99	41.1	23.89
114	530	680	64.99	39.15	25.84
118	530	680	64.99	38.98	26.01
122	530	680	64.99	38.57	26.42
126	528	680	65.86	38.58	27.28
130	528	680	65.86	38.65	27.21
134	528	680	65.86	38.68	27.18
138	528	680	65.86	38.65	27.21

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 3000 gpm Fire Flow split between Nodes 118 and 122
Pipe 39 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
4	533	680	63.69	60.93	2.76
8	535	680	62.82	59.91	2.91
12	548	680	57.19	53.29	3.90
16	527	680	66.29	63.42	2.87
20	544	680	58.93	54.86	4.07
24	544	680	58.93	54.7	4.23
28	548	680	57.19	52.81	4.38
32	539	680	61.09	55.73	5.36
36	534	680	63.26	57.81	5.45
40	526	680	66.72	63.29	3.43
102	532	680	64.12	58.58	5.54
106	532	680	64.12	45.02	19.10
110	530	680	64.99	44.66	20.33
114	530	680	64.99	44.17	20.82
118	530	680	64.99	43.68	21.31
122	530	680	64.99	43.55	21.44
126	528	680	65.86	44.98	20.88
130	528	680	65.86	45.34	20.52
134	528	680	65.86	45.24	20.62
138	528	680	65.86	45.79	20.07

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 4000 gpm Fire Flow; 3500 gpm at Node 110 and 500 gpm at Node 32
Pipe 41 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
4	533	680	63.69	59.09	4.60
8	535	680	62.82	58.2	4.62
12	548	680	57.19	52.44	4.75
16	527	680	66.29	61.69	4.60
20	544	680	58.93	54.15	4.78
24	544	680	58.93	54.13	4.80
28	548	680	57.19	52.37	4.82
32	539	680	61.09	56.14	4.95
36	534	680	63.26	58.31	4.95
40	526	680	66.72	39.01	27.71
102	532	680	64.12	58.66	5.46
106	532	680	64.12	42.9	21.22
110	530	680	64.99	37.28	27.71
114	530	680	64.99	37.28	27.71
118	530	680	64.99	37.28	27.71
122	530	680	64.99	37.28	27.71
126	528	680	65.86	38.15	27.71
130	528	680	65.86	38.15	27.71
134	528	680	65.86	38.15	27.71
138	528	680	65.86	38.15	27.71

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 4000 gpm Fire Flow at Node 110
Pipe 39 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
4	533	680	63.69	59.11	4.58
8	535	680	62.82	58.01	4.81
12	548	680	57.19	50.95	6.24
16	527	680	66.29	61.52	4.77
20	544	680	58.93	52.45	6.48
24	544	680	58.93	52.21	6.72
28	548	680	57.19	50.25	6.94
32	539	680	61.09	52.72	8.37
36	534	680	63.26	54.77	8.49
40	526	680	66.72	61.02	5.70
102	532	680	64.12	55.47	8.65
106	532	680	64.12	41.57	22.55
110	530	680	64.99	40.3	24.69
114	530	680	64.99	41.29	23.70
118	530	680	64.99	41.37	23.62
122	530	680	64.99	41.59	23.40
126	528	680	65.86	42.89	22.97
130	528	680	65.86	43.17	22.69
134	528	680	65.86	42.83	23.03
138	528	680	65.86	43.91	21.95

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: All Pipes Open - Average Day Demand

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	100	0.05
9	16	12.17	0.02
13	12	6.08	0.02
17	12	6.08	0.02
21	16	12.17	0.02
23	12	12.17	0.03
25	16	12.17	0.02
29	12	6.08	0.02
33	12	6.08	0.02
37	16	12.17	0.02
39	16	81.38	0.13
41	12	6.45	0.02
45	24	6.45	0
101	12	-5.45	-0.02
103	10	-5.45	-0.02
105	10	6.45	0.03
109	12	-5.45	-0.02
113	12	-6.45	-0.02
117	12	-2.46	-0.01
121	12	-2.46	-0.01
125	12	-2.46	-0.01
129	12	-2.46	-0.01
133	12	3.99	0.01
137	12	-3.99	-0.01
141	12	-6.45	-0.02

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Peak Hour Demand

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	600	0.27
9	16	73.33	0.12
13	12	36.67	0.1
17	12	36.67	0.1
21	16	73.33	0.12
23	12	73.33	0.21
25	16	73.33	0.12
29	12	36.67	0.1
33	12	36.67	0.1
37	16	73.33	0.12
39	16	490.5	0.78
41	12	36.17	0.1
45	24	36.17	0.03
101	12	-30.17	-0.09
103	10	-30.17	-0.12
105	10	36.17	0.15
109	12	-30.17	-0.09
113	12	-36.17	-0.1
117	12	-13.77	-0.04
121	12	-13.77	-0.04
125	12	-13.77	-0.04
129	12	-13.77	-0.04
133	12	22.39	0.06
137	12	-22.39	-0.06
141	12	-36.17	-0.1

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 3000 gpm Fire Flow split between Nodes 114 and 122

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	3230	1.47
9	16	222.91	0.36
13	12	111.46	0.32
17	12	111.46	0.32
21	16	222.91	0.36
23	12	222.91	0.63
25	16	222.91	0.36
29	12	111.46	0.32
33	12	111.46	0.32
37	16	222.91	0.36
39	16	1490.93	2.38
41	12	1516.15	4.3
45	24	1516.15	1.08
101	12	1486.15	4.22
103	10	1486.15	6.07
105	10	1516.15	6.19
109	12	1486.15	4.22
113	12	1483.85	4.21
117	12	747.64	2.12
121	12	747.64	2.12
125	12	-752.36	-2.13
129	12	-752.36	-2.13
133	12	763.8	2.17
137	12	-763.8	-2.17
141	12	-1516.15	-4.3

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 3000 gpm Fire Flow split between Nodes 126 and 134

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	3230	1.47
9	16	221.21	0.35
13	12	110.61	0.31
17	12	110.61	0.31
21	16	221.21	0.35
23	12	221.21	0.63
25	16	221.21	0.35
29	12	110.61	0.31
33	12	110.61	0.31
37	16	221.21	0.35
39	16	1479.55	2.36
41	12	1529.24	4.34
45	24	1529.24	1.08
101	12	1473.06	4.18
103	10	1473.06	6.02
105	10	1529.24	6.25
109	12	1473.06	4.18
113	12	1470.76	4.17
117	12	648.64	1.84
121	12	648.64	1.84
125	12	648.64	1.84
129	12	-851.36	-2.41
133	12	677.88	1.92
137	12	822.12	2.33
141	12	-1529.24	-4.34

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 4000 gpm Fire Flow at Node 110

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	4227.7	1.92
9	16	293.43	0.47
13	12	146.71	0.42
17	12	146.71	0.42
21	16	293.43	0.47
23	12	293.43	0.83
25	16	293.43	0.47
29	12	146.71	0.42
33	12	146.71	0.42
37	16	293.43	0.47
39	16	1962.59	3.13
41	12	1971.69	5.59
45	24	1971.69	1.4
101	12	2028.31	5.75
103	10	2028.31	8.29
105	10	1971.69	8.05
109	12	2028.31	5.75
113	12	-1971.69	-5.59
117	12	-750.89	-2.13
121	12	-750.89	-2.13
125	12	-750.89	-2.13
129	12	-750.89	-2.13
133	12	1220.79	3.46
137	12	-1220.79	-3.46
141	12	-1971.69	-5.59

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 3000 gpm Fire Flow split between Nodes 126 and 134
Pipe 41 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	3230	1.47
9	16	420.11	0.67
13	12	210.06	0.6
17	12	210.06	0.6
21	16	420.11	0.67
23	12	420.11	1.19
25	16	420.11	0.67
29	12	210.06	0.6
33	12	210.06	0.6
37	16	420.11	0.67
39	16	2809.89	4.48
41	12	Closed	
45	24	0	0
101	12	3002.3	8.52
103	10	3002.3	12.26
105	10	0	0
109	12	3002.3	8.52
113	12	3000	8.51
117	12	1135.1	3.22
121	12	1135.1	3.22
125	12	1135.1	3.22
129	12	-364.9	-1.04
133	12	-364.9	-1.04
137	12	1864.9	5.29
141	12	0	0

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 3000 gpm Fire Flow split between Nodes 118 and 122
Pipe 39 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	3230	1.47
9	16	1652.09	2.64
13	12	826.04	2.34
17	12	826.04	2.34
21	16	1652.09	2.64
23	12	1652.09	4.69
25	16	1652.09	2.64
29	12	826.04	2.34
33	12	826.04	2.34
37	16	1652.09	2.64
39	16	Closed	
41	12	1577.92	4.48
45	24	1577.92	1.12
101	12	1424.39	4.04
103	10	1424.39	5.82
105	10	1577.92	6.45
109	12	1424.39	4.04
113	12	1422.09	4.03
117	12	2091.53	5.93
121	12	591.53	1.68
125	12	-908.47	-2.58
129	12	-908.47	-2.58
133	12	669.44	1.9
137	12	-669.44	-1.9
141	12	-1577.92	-4.48

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 4000 gpm Fire Flow; 3500 gpm at Node 110 and 500 gpm at Node 32
Pipe 41 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	4227.7	1.92
9	16	557.57	0.89
13	12	278.78	0.79
17	12	278.78	0.79
21	16	557.57	0.89
23	12	557.57	1.58
25	16	557.57	0.89
29	12	278.78	0.79
33	12	278.78	0.79
37	16	57.57	0.09
39	16	3670.13	5.86
41	12	Closed	
45	24	0	0
101	12	3500	9.93
103	10	3500	14.3
105	10	0	0
109	12	3500	9.93
113	12	0	0
117	12	0	0
121	12	0	0
125	12	0	0
129	12	0	0
133	12	0	0
137	12	0	0
141	12	0	0

Project: California Terraces Planning Area 61 Project
Date: 9/14/18
Job Number: 648-032

Scenario: Maximum Day Demand plus 4000 gpm Fire Flow at Node 110
Pipe 39 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	4099	1.86
9	16	2021.07	3.22
13	12	1010.53	2.87
17	12	1010.53	2.87
21	16	2021.07	3.22
23	12	2021.07	5.73
25	16	2021.07	3.22
29	12	1010.53	2.87
33	12	1010.53	2.87
37	16	2021.07	3.22
39	16		Closed
41	12	2077.93	5.89
45	24	2077.93	1.47
101	12	1922.07	5.45
103	10	1922.07	7.85
105	10	2077.93	8.49
109	12	1922.07	5.45
113	12	-2077.93	-5.89
117	12	-791.37	-2.24
121	12	-791.37	-2.24
125	12	-791.37	-2.24
129	12	-791.37	-2.24
133	12	1286.56	3.65
137	12	-1286.56	-3.65
141	12	-2077.93	-5.89

FLOWRATE IS EXPRESSED IN GPM AND PRESSURE IN PSIG

A SUMMARY OF THE ORIGINAL DATA FOLLOWS

PIPE NO.	NODE NOS.		LENGTH (FEET)	DIAMETER (INCHES)	ROUGHNESS	MINOR LOSS K	FIXED GRADE
1	0	4	1300.0	30.0	120.0	.00	680.00
9	4	8	200.0	16.0	120.0	.00	
13	8	12	1100.0	12.0	120.0	.00	
17	8	12	1100.0	12.0	120.0	.00	
21	12	20	200.0	16.0	120.0	.00	
23	20	24	50.0	12.0	120.0	.00	
25	24	28	200.0	16.0	120.0	.00	
29	28	32	1100.0	12.0	120.0	.00	
33	28	32	1100.0	12.0	120.0	.00	
37	32	36	100.0	16.0	120.0	.00	
39	4	36	100.0	16.0	120.0	.00	
41	16	40	190.0	12.0	120.0	.00	
45	4	16	1100.0	24.0	120.0	.00	
101	36	102	40.0	12.0	120.0	.00	
103	102	106	20.0	10.0	120.0	20.00	
105	40	138	20.0	10.0	120.0	20.00	
109	106	110	500.0	12.0	120.0	.00	
113	110	114	200.0	12.0	120.0	.00	
117	114	118	100.0	12.0	120.0	.00	
121	118	122	260.0	12.0	120.0	.00	
125	122	126	530.0	12.0	120.0	.00	
129	126	130	340.0	12.0	120.0	.00	
133	130	134	170.0	12.0	120.0	.00	
137	114	134	330.0	12.0	120.0	.00	
141	130	138	150.0	12.0	120.0	.00	

JUNCTION NUMBER	DEMAND	ELEVATION	CONNECTING PIPES			
4	.00	533.00	1	9	39	45
8	.00	535.00	9	13	17	
12	.00	548.00	13	17	21	
16	.00	527.00	41	45		
20	.00	544.00	21	23		
24	.00	544.00	23	25		
28	.00	548.00	25	29	33	
32	.00	539.00	29	33	37	
36	99.00	534.00	37	39	101	
40	.00	526.00	41	105		
102	.00	532.00	101	103		
106	.00	532.00	103	109		
110	1.00	530.00	109	113		
114	.00	530.00	113	117	137	
118	.00	530.00	117	121		

122	.00	530.00	121	125	
126	.00	528.00	125	129	
130	.00	528.00	129	133	141
134	.00	528.00	133	137	
138	.00	528.00	105	141	

OUTPUT SELECTION: ALL RESULTS ARE OUTPUT EACH PERIOD

THIS SYSTEM HAS 25 PIPES WITH 20 JUNCTIONS , 5 LOOPS AND 1 FGNS

THE RESULTS ARE OBTAINED AFTER 10 TRIALS WITH AN ACCURACY = .00323

PA61 Computer Hydraulic Analysis
Average Day Demand

PIPE NO.	NODE NOS.		FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0	4	100.00	.00	.00	.00	.05	.00
9	4	8	12.17	.00	.00	.00	.02	.00
13	8	12	6.08	.00	.00	.00	.02	.00
17	8	12	6.08	.00	.00	.00	.02	.00
21	12	20	12.17	.00	.00	.00	.02	.00
23	20	24	12.17	.00	.00	.00	.03	.00
25	24	28	12.17	.00	.00	.00	.02	.00
29	28	32	6.08	.00	.00	.00	.02	.00
33	28	32	6.08	.00	.00	.00	.02	.00
37	32	36	12.17	.00	.00	.00	.02	.00
39	4	36	81.38	.00	.00	.00	.13	.01
41	16	40	6.45	.00	.00	.00	.02	.00
45	4	16	6.45	.00	.00	.00	.00	.00
101	36	102	-5.45	.00	.00	.00	-.02	.00
103	102	106	-5.45	.00	.00	.00	-.02	.00
105	40	138	6.45	.00	.00	.00	.03	.00
109	106	110	-5.45	.00	.00	.00	-.02	.00
113	110	114	-6.45	.00	.00	.00	-.02	.00
117	114	118	-2.46	.00	.00	.00	-.01	.00
121	118	122	-2.46	.00	.00	.00	-.01	.00
125	122	126	-2.46	.00	.00	.00	-.01	.00
129	126	130	-2.46	.00	.00	.00	-.01	.00
133	130	134	3.99	.00	.00	.00	.01	.00
137	114	134	-3.99	.00	.00	.00	-.01	.00
141	130	138	-6.45	.00	.00	.00	-.02	.00

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
4	.00	680.00	533.00	63.70
8	.00	680.00	535.00	62.83
12	.00	680.00	548.00	57.20
16	.00	680.00	527.00	66.30
20	.00	680.00	544.00	58.93
24	.00	680.00	544.00	58.93
28	.00	680.00	548.00	57.20

32	.00	680.00	539.00	61.10
36	99.00	680.00	534.00	63.27
40	.00	680.00	526.00	66.73
102	.00	680.00	532.00	64.13
106	.00	680.00	532.00	64.13
110	1.00	680.00	530.00	65.00
114	.00	680.00	530.00	65.00
118	.00	680.00	530.00	65.00
122	.00	680.00	530.00	65.00
126	.00	680.00	528.00	65.87
130	.00	680.00	528.00	65.87
134	.00	680.00	528.00	65.87
138	.00	680.00	528.00	65.87

THE NET SYSTEM DEMAND = 100.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	100.00

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 100.00
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = .00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE DEMANDS ARE CHANGED FROM ORIGINAL VALUES BY A FACTOR = 6.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 635.0

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00016

PA61 Computer Hydraulic Analysis
Peak Hour Demand

PIPE NO.	NODE NOS.		FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0	4	600.00	.02	.00	.00	.27	.01
9	4	8	73.33	.00	.00	.00	.12	.01
13	8	12	36.67	.01	.00	.00	.10	.01
17	8	12	36.67	.01	.00	.00	.10	.01
21	12	20	73.33	.00	.00	.00	.12	.01
23	20	24	73.33	.00	.00	.00	.21	.02
25	24	28	73.33	.00	.00	.00	.12	.01
29	28	32	36.67	.01	.00	.00	.10	.01
33	28	32	36.67	.01	.00	.00	.10	.01
37	32	36	73.33	.00	.00	.00	.12	.01
39	4	36	490.50	.02	.00	.00	.78	.19
41	16	40	36.17	.00	.00	.00	.10	.01
45	4	16	36.17	.00	.00	.00	.03	.00

101	36	102	-30.17	.00	.00	.00	-.09	.00
103	102	106	-30.17	.00	.00	.00	-.12	-.01
105	40	138	36.17	.00	.00	.01	.15	.02
109	106	110	-30.17	.00	.00	.00	-.09	.00
113	110	114	-36.17	.00	.00	.00	-.10	-.01
117	114	118	-13.77	.00	.00	.00	-.04	.00
121	118	122	-13.77	.00	.00	.00	-.04	.00
125	122	126	-13.77	.00	.00	.00	-.04	.00
129	126	130	-13.77	.00	.00	.00	-.04	.00
133	130	134	22.39	.00	.00	.00	.06	.00
137	114	134	-22.39	.00	.00	.00	-.06	.00
141	130	138	-36.17	.00	.00	.00	-.10	-.01

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
4	.00	634.98	533.00	44.19
8	.00	634.98	535.00	43.33
12	.00	634.97	548.00	37.69
16	.00	634.98	527.00	46.79
20	.00	634.97	544.00	39.42
24	.00	634.97	544.00	39.42
28	.00	634.97	548.00	37.69
32	.00	634.96	539.00	41.58
36	594.00	634.96	534.00	43.75
40	.00	634.98	526.00	47.23
102	.00	634.96	532.00	44.62
106	.00	634.97	532.00	44.62
110	6.00	634.97	530.00	45.49
114	.00	634.97	530.00	45.49
118	.00	634.97	530.00	45.49
122	.00	634.97	530.00	45.49
126	.00	634.97	528.00	46.35
130	.00	634.97	528.00	46.36
134	.00	634.97	528.00	46.35
138	.00	634.97	528.00	46.36

THE NET SYSTEM DEMAND = 600.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	600.00

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 600.00
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = .00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE DEMANDS ARE CHANGED FROM ORIGINAL VALUES BY A FACTOR = 2.30

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
114	1500.00
122	1500.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 674.0

PIPE NO.	NODE NOS.		LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
103	102	106	20.0	10.0	120.0	59.00	.00
105	40	138	20.0	10.0	120.0	59.00	.00

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00048

PA61 Computer Hydraulic Analysis
Max DAy Demand plus 3000 gpm Fire Flow split between Nodes 114 and 122

PIPE NO.	NODE NOS.		FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0	4	3230.00	.39	.00	.00	1.47	.30
9	4	8	222.91	.01	.00	.00	.36	.04
13	8	12	111.46	.06	.00	.00	.32	.05
17	8	12	111.46	.06	.00	.00	.32	.05
21	12	20	222.91	.01	.00	.00	.36	.04
23	20	24	222.91	.01	.00	.00	.63	.18
25	24	28	222.91	.01	.00	.00	.36	.04
29	28	32	111.46	.06	.00	.00	.32	.05
33	28	32	111.46	.06	.00	.00	.32	.05
37	32	36	222.91	.00	.00	.00	.36	.04
39	4	36	1490.93	.15	.00	.00	2.38	1.52
41	16	40	1516.15	1.21	.00	.00	4.30	6.36
45	4	16	1516.15	.24	.00	.00	1.08	.22
101	36	102	1486.15	.25	.00	.00	4.22	6.13
103	102	106	1486.15	.30	.00	33.76	6.07	14.89
105	40	138	1516.15	.31	.00	35.13	6.19	15.45
109	106	110	1486.15	3.06	.00	.00	4.22	6.13
113	110	114	1483.85	1.22	.00	.00	4.21	6.11
117	114	118	747.64	.17	.00	.00	2.12	1.72
121	118	122	747.64	.45	.00	.00	2.12	1.72
125	122	126	-752.36	-.92	.00	.00	-2.13	-1.74
129	126	130	-752.36	-.59	.00	.00	-2.13	-1.74
133	130	134	763.80	.30	.00	.00	2.17	1.79
137	114	134	-763.80	-.59	.00	.00	-2.17	-1.79
141	130	138	-1516.15	-.95	.00	.00	-4.30	-6.36

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
4	.00	673.61	533.00	60.93
8	.00	673.60	535.00	60.06
12	.00	673.55	548.00	54.40
16	.00	673.37	527.00	63.43
20	.00	673.54	544.00	56.13
24	.00	673.53	544.00	56.13
28	.00	673.52	548.00	54.39
32	.00	673.47	539.00	58.27
36	227.70	673.46	534.00	60.43
40	.00	672.17	526.00	63.34
102	.00	673.22	532.00	61.19

106	.00	639.16	532.00	46.44
110	2.30	636.10	530.00	45.98
114	1500.00	634.88	530.00	45.45
118	.00	634.71	530.00	45.37
122	1500.00	634.26	530.00	45.18
126	.00	635.18	528.00	46.44
130	.00	635.77	528.00	46.70
134	.00	635.47	528.00	46.57
138	.00	636.72	528.00	47.11

THE NET SYSTEM DEMAND = 3230.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	3230.00

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 3230.00
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = .00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE DEMANDS ARE CHANGED FROM ORIGINAL VALUES BY A FACTOR = 2.30

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
126	1500.00
134	1500.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

PIPE NO.	NODE NOS.		LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
103	102	106	20.0	10.0	120.0	59.00	.00
105	40	138	20.0	10.0	120.0	59.00	.00

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00028

PA61 Computer Hydraulic Analysis
Max Day Demand plus 3000 gpm Fire Flow split between Nodes 126 and 134

PIPE NO.	NODE NOS.		FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0	4	3230.00	.39	.00	.00	1.47	.30
9	4	8	221.21	.01	.00	.00	.35	.04
13	8	12	110.61	.05	.00	.00	.31	.05
17	8	12	110.61	.05	.00	.00	.31	.05
21	12	20	221.21	.01	.00	.00	.35	.04
23	20	24	221.21	.01	.00	.00	.63	.18
25	24	28	221.21	.01	.00	.00	.35	.04
29	28	32	110.61	.05	.00	.00	.31	.05
33	28	32	110.61	.05	.00	.00	.31	.05

37	32	36	221.21	.00	.00	.00	.35	.04
39	4	36	1479.55	.15	.00	.00	2.36	1.50
41	16	40	1529.24	1.23	.00	.00	4.34	6.46
45	4	16	1529.24	.24	.00	.00	1.08	.22
101	36	102	1473.06	.24	.00	.00	4.18	6.03
103	102	106	1473.06	.29	.00	33.17	6.02	14.64
105	40	138	1529.24	.31	.00	35.74	6.25	15.70
109	106	110	1473.06	3.01	.00	.00	4.18	6.03
113	110	114	1470.76	1.20	.00	.00	4.17	6.01
117	114	118	648.64	.13	.00	.00	1.84	1.32
121	118	122	648.64	.34	.00	.00	1.84	1.32
125	122	126	648.64	.70	.00	.00	1.84	1.32
129	126	130	-851.36	-.74	.00	.00	-2.41	-2.18
133	130	134	677.88	.24	.00	.00	1.92	1.43
137	114	134	822.12	.68	.00	.00	2.33	2.05
141	130	138	-1529.24	-.97	.00	.00	-4.34	-6.46

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
4	.00	673.61	533.00	60.93
8	.00	673.60	535.00	60.06
12	.00	673.55	548.00	54.40
16	.00	673.37	527.00	63.43
20	.00	673.54	544.00	56.13
24	.00	673.53	544.00	56.13
28	.00	673.52	548.00	54.39
32	.00	673.47	539.00	58.27
36	227.70	673.46	534.00	60.43
40	.00	672.14	526.00	63.33
102	.00	673.22	532.00	61.20
106	.00	639.76	532.00	46.70
110	2.30	636.75	530.00	46.26
114	.00	635.55	530.00	45.74
118	.00	635.42	530.00	45.68
122	.00	635.07	530.00	45.53
126	1500.00	634.38	528.00	46.10
130	.00	635.12	528.00	46.42
134	1500.00	634.87	528.00	46.31
138	.00	636.09	528.00	46.84

THE NET SYSTEM DEMAND = 3230.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	3230.00

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 3230.00
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = .00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE DEMANDS ARE CHANGED FROM ORIGINAL VALUES BY A FACTOR = 2.30

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
110	4000.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 670.0

PIPE NO.	NODE NOS.		LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
103	102	106	20.0	10.0	120.0	33.00	.00
105	40	138	20.0	10.0	120.0	33.00	.00

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00222

PA61 Computer Hydraulic Analysis
Max Day Demand plus 4000 gpm Commercial Fire FLow at Node 110

PIPE NO.	NODE NOS.		FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0	4	4227.70	.64	.00	.00	1.92	.49
9	4	8	293.43	.01	.00	.00	.47	.07
13	8	12	146.71	.09	.00	.00	.42	.08
17	8	12	146.71	.09	.00	.00	.42	.08
21	12	20	293.43	.01	.00	.00	.47	.07
23	20	24	293.43	.02	.00	.00	.83	.30
25	24	28	293.43	.01	.00	.00	.47	.07
29	28	32	146.71	.09	.00	.00	.42	.08
33	28	32	146.71	.09	.00	.00	.42	.08
37	32	36	293.43	.01	.00	.00	.47	.07
39	4	36	1962.59	.25	.00	.00	3.13	2.53
41	16	40	1971.69	1.96	.00	.00	5.59	10.34
45	4	16	1971.69	.39	.00	.00	1.40	.35
101	36	102	2028.31	.44	.00	.00	5.75	10.90
103	102	106	2028.31	.53	.00	35.17	8.29	26.48
105	40	138	1971.69	.50	.00	33.23	8.05	25.13
109	106	110	2028.31	5.45	.00	.00	5.75	10.90
113	110	114	-1971.69	-2.07	.00	.00	-5.59	-10.34
117	114	118	-750.89	-.17	.00	.00	-2.13	-1.73
121	118	122	-750.89	-.45	.00	.00	-2.13	-1.73
125	122	126	-750.89	-.92	.00	.00	-2.13	-1.73
129	126	130	-750.89	-.59	.00	.00	-2.13	-1.73
133	130	134	1220.79	.72	.00	.00	3.46	4.26
137	114	134	-1220.79	-1.40	.00	.00	-3.46	-4.26
141	130	138	-1971.69	-1.55	.00	.00	-5.59	-10.34

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
4	.00	669.36	533.00	59.09
8	.00	669.35	535.00	58.22
12	.00	669.26	548.00	52.54
16	.00	668.97	527.00	61.52
20	.00	669.24	544.00	54.27
24	.00	669.23	544.00	54.26
28	.00	669.21	548.00	52.52
32	.00	669.12	539.00	56.38

36	227.70	669.11	534.00	58.55
40	.00	667.01	526.00	61.10
102	.00	668.67	532.00	59.23
106	.00	632.98	532.00	43.76
110	4000.00	627.53	530.00	42.26
114	.00	629.59	530.00	43.16
118	.00	629.77	530.00	43.23
122	.00	630.22	530.00	43.43
126	.00	631.13	528.00	44.69
130	.00	631.72	528.00	44.95
134	.00	631.00	528.00	44.63
138	.00	633.27	528.00	45.62

THE NET SYSTEM DEMAND = 4227.70

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	4227.70

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 4227.70
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = .00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE DEMANDS ARE CHANGED FROM ORIGINAL VALUES BY A FACTOR = 2.30

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
126	1500.00
134	1500.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 674.0

PIPE NO.	NODE NOS.		LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
103	102	106	20.0	10.0	120.0	15.00	.00
105	40	138	20.0	10.0	120.0	15.00	.00
41	16	40	190.0	12.0	120.0	.00	.00

LINE 41 IS CLOSED

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00001

PA61 Computer Hydraulic Analysis
Max DAy Demand plus 3000 gpm Fire Flow split between Nodes 126 and 134
Simulated Public Pipe Break No. 41

PIPE NO.	NODE NOS.		FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0	4	3230.00	.39	.00	.00	1.47	.30
9	4	8	420.11	.03	.00	.00	.67	.15

13	8	12	210.06	.18	.00	.00	.60	.16
17	8	12	210.06	.18	.00	.00	.60	.16
21	12	20	420.11	.03	.00	.00	.67	.15
23	20	24	420.11	.03	.00	.00	1.19	.59
25	24	28	420.11	.03	.00	.00	.67	.15
29	28	32	210.06	.18	.00	.00	.60	.16
33	28	32	210.06	.18	.00	.00	.60	.16
37	32	36	420.11	.01	.00	.00	.67	.15
39	4	36	2809.89	.49	.00	.00	4.48	4.91
LINE 41 IS CLOSED								
45	4	16	.00	.00	.00	.00	.00	.00
101	36	102	3002.30	.90	.00	.00	8.52	22.53
103	102	106	3002.30	1.09	.00	35.03	12.26	54.75
105	40	138	.00	.00	.00	.00	.00	.00
109	106	110	3002.30	11.26	.00	.00	8.52	22.53
113	110	114	3000.00	4.50	.00	.00	8.51	22.50
117	114	118	1135.10	.37	.00	.00	3.22	3.72
121	118	122	1135.10	.97	.00	.00	3.22	3.72
125	122	126	1135.10	1.97	.00	.00	3.22	3.72
129	126	130	-364.90	-.15	.00	.00	-1.04	-.45
133	130	134	-364.90	-.08	.00	.00	-1.04	-.45
137	114	134	1864.90	3.08	.00	.00	5.29	9.33
141	130	138	.00	.00	.00	.00	.00	.00

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
4	.00	673.61	533.00	60.93
8	.00	673.58	535.00	60.05
12	.00	673.40	548.00	54.34
16	.00	673.61	527.00	63.53
20	.00	673.38	544.00	56.06
24	.00	673.35	544.00	56.05
28	.00	673.32	548.00	54.30
32	.00	673.14	539.00	58.13
36	227.70	673.12	534.00	60.29
40	.00	617.18	526.00	39.51
102	.00	672.22	532.00	60.76
106	.00	636.10	532.00	45.11
110	2.30	624.84	530.00	41.10
114	.00	620.34	530.00	39.15
118	.00	619.96	530.00	38.98
122	.00	619.00	530.00	38.57
126	1500.00	617.03	528.00	38.58
130	.00	617.18	528.00	38.65
134	1500.00	617.26	528.00	38.68
138	.00	617.18	528.00	38.65

THE NET SYSTEM DEMAND = 3230.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	3230.00

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 3230.00
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = .00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE DEMANDS ARE CHANGED FROM ORIGINAL VALUES BY A FACTOR = 2.30

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
118	1500.00
122	1500.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 674.0

PIPE NO.	NODE NOS.		LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
41	16	40	190.0	12.0	120.0	.00	.00
39	4	36	100.0	16.0	120.0	.00	.00
LINE 39 IS CLOSED							
103	102	106	20.0	10.0	120.0	59.00	.00
105	40	138	20.0	10.0	120.0	59.00	.00

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00155

PA61 Computer Hydraulic Analysis
Max Day Demand plus 3000 gpm Fire FLow split between Nodes 118 and 122
Simulated Public Pipe Break No. 39

PIPE NO.	NODE NOS.		FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0	4	3230.00	.39	.00	.00	1.47	.30
9	4	8	1652.09	.37	.00	.00	2.64	1.84
13	8	12	826.04	2.27	.00	.00	2.34	2.06
17	8	12	826.04	2.27	.00	.00	2.34	2.06
21	12	20	1652.09	.37	.00	.00	2.64	1.84
23	20	24	1652.09	.37	.00	.00	4.69	7.45
25	24	28	1652.09	.37	.00	.00	2.64	1.84
29	28	32	826.04	2.27	.00	.00	2.34	2.06
33	28	32	826.04	2.27	.00	.00	2.34	2.06
37	32	36	1652.09	.18	.00	.00	2.64	1.84
LINE 39 IS CLOSED								
41	16	40	1577.92	1.30	.00	.00	4.48	6.84
45	4	16	1577.92	.26	.00	.00	1.12	.23
101	36	102	1424.39	.23	.00	.00	4.04	5.66
103	102	106	1424.39	.28	.00	31.01	5.82	13.76
105	40	138	1577.92	.33	.00	38.05	6.45	16.63
109	106	110	1424.39	2.83	.00	.00	4.04	5.66
113	110	114	1422.09	1.13	.00	.00	4.03	5.65
117	114	118	2091.53	1.15	.00	.00	5.93	11.53
121	118	122	591.53	.29	.00	.00	1.68	1.11
125	122	126	-908.47	-1.30	.00	.00	-2.58	-2.46
129	126	130	-908.47	-.84	.00	.00	-2.58	-2.46
133	130	134	669.44	.24	.00	.00	1.90	1.40
137	114	134	-669.44	-.46	.00	.00	-1.90	-1.40
141	130	138	-1577.92	-1.03	.00	.00	-4.48	-6.84

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
4	.00	673.61	533.00	60.93
8	.00	673.25	535.00	59.91
12	.00	670.98	548.00	53.29
16	.00	673.36	527.00	63.42
20	.00	670.61	544.00	54.86
24	.00	670.24	544.00	54.70
28	.00	669.87	548.00	52.81
32	.00	667.60	539.00	55.73
36	227.70	667.41	534.00	57.81
40	.00	672.06	526.00	63.29
102	.00	667.19	532.00	58.58
106	.00	635.90	532.00	45.02
110	2.30	633.07	530.00	44.66
114	.00	631.94	530.00	44.17
118	1500.00	630.79	530.00	43.68
122	1500.00	630.50	530.00	43.55
126	.00	631.80	528.00	44.98
130	.00	632.64	528.00	45.34
134	.00	632.40	528.00	45.24
138	.00	633.67	528.00	45.79

THE NET SYSTEM DEMAND = 3230.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	3230.00

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 3230.00
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = .00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE DEMANDS ARE CHANGED FROM ORIGINAL VALUES BY A FACTOR = 2.30

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
110	3500.00
32	500.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 670.0

PIPE NO.	NODE NOS.		LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
39	4	36	100.0	16.0	120.0	.00	.00
41	16	40	190.0	12.0	120.0	.00	.00
LINE 41 IS CLOSED							
103	102	106	20.0	10.0	120.0	11.00	.00
105	40	138	20.0	10.0	120.0	11.00	.00

THE RESULTS ARE OBTAINED AFTER 5 TRIALS WITH AN ACCURACY = .00035

PA61 Computer Hydraulic Analysis
Max Day Demand plus 4000 gpm Fire FLow; 3,500 gpm at Node 110 and 500 gpm at Node 32
Simulated Public Pipe Break No. 41

PIPE NO.	NODE NOS.		FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0	4	4227.70	.64	.00	.00	1.92	.49
9	4	8	557.57	.05	.00	.00	.89	.25
13	8	12	278.78	.30	.00	.00	.79	.28
17	8	12	278.78	.30	.00	.00	.79	.28
21	12	20	557.57	.05	.00	.00	.89	.25
23	20	24	557.57	.05	.00	.00	1.58	1.00
25	24	28	557.57	.05	.00	.00	.89	.25
29	28	32	278.78	.30	.00	.00	.79	.28
33	28	32	278.78	.30	.00	.00	.79	.28
37	32	36	57.57	.00	.00	.00	.09	.00
39	4	36	3670.13	.81	.00	.00	5.86	8.05
LINE 41 IS CLOSED								
45	4	16	.00	.00	.00	.00	.00	.00
101	36	102	3500.00	1.20	.00	.00	9.93	29.93
103	102	106	3500.00	1.45	.00	34.91	14.30	72.73
105	40	138	.00	.00	.00	.00	.00	.00
109	106	110	3500.00	14.97	.00	.00	9.93	29.93
113	110	114	.00	.00	.00	.00	.00	.00
117	114	118	.00	.00	.00	.00	.00	.00
121	118	122	.00	.00	.00	.00	.00	.00
125	122	126	.00	.00	.00	.00	.00	.00
129	126	130	.00	.00	.00	.00	.00	.00
133	130	134	.00	.00	.00	.00	.00	.00
137	114	134	.00	.00	.00	.00	.00	.00
141	130	138	.00	.00	.00	.00	.00	.00

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
4	.00	669.36	533.00	59.09
8	.00	669.31	535.00	58.20
12	.00	669.01	548.00	52.44
16	.00	669.36	527.00	61.69
20	.00	668.96	544.00	54.15
24	.00	668.91	544.00	54.13
28	.00	668.86	548.00	52.37
32	500.00	668.56	539.00	56.14
36	227.70	668.56	534.00	58.31
40	.00	616.03	526.00	39.01
102	.00	667.36	532.00	58.66
106	.00	631.00	532.00	42.90
110	3500.00	616.03	530.00	37.28
114	.00	616.03	530.00	37.28
118	.00	616.03	530.00	37.28
122	.00	616.03	530.00	37.28
126	.00	616.03	528.00	38.15
130	.00	616.03	528.00	38.15
134	.00	616.03	528.00	38.15
138	.00	616.03	528.00	38.15

THE NET SYSTEM DEMAND = 4227.70

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	4227.70

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 4227.70
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = .00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
110	4000.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

PIPE NO.	NODE NOS.		LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
41	16	40	190.0	12.0	120.0	.00	.00
39	4	36	100.0	16.0	120.0	.00	.00
LINE 39 IS CLOSED							
103	102	106	20.0	10.0	120.0	33.00	.00
105	40	138	20.0	10.0	120.0	33.00	.00

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00234

PA61 Computer Hydraulic Analysis
Max Day Demand plus 4000 gpm Fire FLow at Node 110
Simulated Public Pipe Break No. 39

PIPE NO.	**NODE NOS.**		**FLOWRATE**	**HEAD LOSS**	**PUMP HEAD**	**MINOR LOSS**	**VELOCITY**	**HL/1000**
1	0	4	4099.00	.60	.00	.00	1.86	.46
9	4	8	2021.07	.53	.00	.00	3.22	2.67
13	8	12	1010.53	3.30	.00	.00	2.87	3.00
17	8	12	1010.53	3.30	.00	.00	2.87	3.00
21	12	20	2021.07	.53	.00	.00	3.22	2.67
23	20	24	2021.07	.54	.00	.00	5.73	10.83
25	24	28	2021.07	.53	.00	.00	3.22	2.67
29	28	32	1010.53	3.30	.00	.00	2.87	3.00
33	28	32	1010.53	3.30	.00	.00	2.87	3.00
37	32	36	2021.07	.27	.00	.00	3.22	2.67
LINE 39 IS CLOSED								
41	16	40	2077.93	2.17	.00	.00	5.89	11.40
45	4	16	2077.93	.43	.00	.00	1.47	.39
101	36	102	1922.07	.39	.00	.00	5.45	9.86
103	102	106	1922.07	.48	.00	31.58	7.85	23.97
105	40	138	2077.93	.55	.00	36.91	8.49	27.69
109	106	110	1922.07	4.93	.00	.00	5.45	9.86
113	110	114	-2077.93	-2.28	.00	.00	-5.89	-11.40

117	114	118	-791.37	-.19	.00	.00	-2.24	-1.91
121	118	122	-791.37	-.50	.00	.00	-2.24	-1.91
125	122	126	-791.37	-1.01	.00	.00	-2.24	-1.91
129	126	130	-791.37	-.65	.00	.00	-2.24	-1.91
133	130	134	1286.56	.80	.00	.00	3.65	4.69
137	114	134	-1286.56	-1.55	.00	.00	-3.65	-4.69
141	130	138	-2077.93	-1.71	.00	.00	-5.89	-11.40

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
4	.00	669.40	533.00	59.11
8	.00	668.87	535.00	58.01
12	.00	665.57	548.00	50.95
16	.00	668.97	527.00	61.52
20	.00	665.03	544.00	52.45
24	.00	664.49	544.00	52.21
28	.00	663.96	548.00	50.25
32	.00	660.66	539.00	52.72
36	99.00	660.39	534.00	54.77
40	.00	666.80	526.00	61.02
102	.00	660.00	532.00	55.47
106	.00	627.94	532.00	41.57
110	4000.00	623.01	530.00	40.30
114	.00	625.28	530.00	41.29
118	.00	625.48	530.00	41.37
122	.00	625.97	530.00	41.59
126	.00	626.98	528.00	42.89
130	.00	627.63	528.00	43.17
134	.00	626.83	528.00	42.83
138	.00	629.34	528.00	43.91

THE NET SYSTEM DEMAND = 4099.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	4099.00

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 4099.00
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = .00

For Non-Health Hazard Applications

Job Name ______________________

Job Location ______________________

Engineer ______________________

Approval ______________________

Contractor ______________________

Approval ______________________

Contractor's P.O. No. ______________________

Representative ______________________

LEAD FREE*

MasterSeries® LF856

Double Check Detector Backflow Prevention Assemblies (Type II)

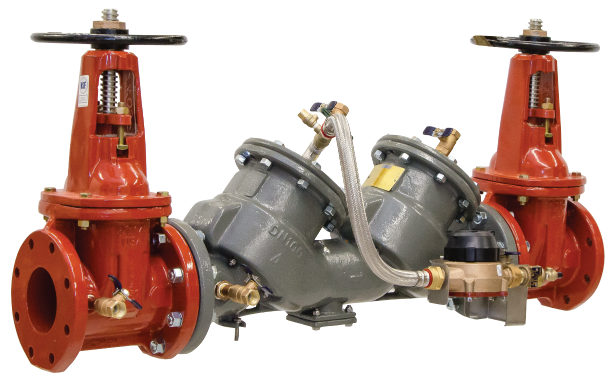
Size: 2½" - 10"

The FEBCO MasterSeries LF856 Double Check Detector Assemblies are designed to protect drinking water supplies from dangerous cross-connections in accordance with national plumbing codes and water authority requirements for non-health hazard non-potable service applications such as irrigation, fire line, or industrial processing. This Backflow Assembly is primarily used for protection of drinking water systems and fire sprinkler systems, where Local Governing Code mandates protection from non-potable quality water being pumped or siphoned back into the potable water system.

Features

Main Valve:
- Inline Serviceable Assembly
- No Special Tools Required for Servicing
- Captured Modular Spring Assembly
- Reversible & Replaceable Discs
- Field Replaceable Seats
- Ductile Iron Valve Body Design
- Stainless Steel Check Components
- Winterization feature with disc retainers and valve body drain ports
- Clapper Check Assembly
- Commonality between 1st & 2nd Check Components
- Captured O-ring Design

Auxiliary Bypass:
- Compact Bypass Design; Remains within Main Valve Assembly Profile
- Inline Serviceable ¾" Backflow Assembly
- No Special Tools Required for Servicing
- Field Replaceable Seats & Discs
- Detect Potential Underground Water Leaks
- Detect Unauthorized Water Usage



Model LF856 Double Check Detector Assembly

Sample RPDA BF

Specifications

The FEBCO MasterSeries LF856 Double Check Detector Valve Assembly shall be installed on the potable water supply and at each point of cross-connection to protect against possible backpressure and backsiphonage conditions for non-health hazard (i.e., pollutant) applications. The assembly shall consist of a main line valve body composed of two (2) independently acting approved clapper style check modules with replaceable seats and disc rubbers. Servicing of both check modules does not require any special tools and are accessed through independent top entry covers. This assembly shall be fitted with approved UL/FM inlet/outlet resilient seated shutoff valves and contain four (4) properly located resilient seated test cocks as specified by AWWA Standard C510. The auxiliary bypass line contains a ⅝"x ¾" (16 x 19mm) Water Meter that complies with ANSI/AWWA Standard C700 coupled with an approved check assembly. The bypass line is designed to detect leaks or unauthorized water usage of the water system while protecting against possible backpressure and backsiphonage conditions for non-health hazard (i.e., pollutant) application. Flow and pressure loss performance parameters shall meet the requirements of AWWA Standard C510.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

FEBCO®

A WATTS Brand

Options - Suffix

OSY:	UL/FM Approved OS&Y Gate Valves (ANSI/AWWA C515 Compliant)
CFM:	Totalizing Cubic feet/min 5/8" x 3/4" Water Meter (ANSI/AWWA C700 Compliant)
GPM:	Totalizing Gallons/min 5/8"x 3/4" Water Meter (ANSI/AWWA C700 Compliant)
LG:	Less Shutoff valves; This is NOT an APPROVED ASSEMBLY

Example Ordering Descriptions:

4" LF856-OSY-GPM - Valve Assembly fitted with OS&Y Shutoff Valves & Gallon Feet per Minute Water Meter

4" LF856-OSY-CFM - Valve Assembly fitted with OS&Y Shutoff Valves, Cubic feet per Minute Water Meter

Assembly Flow Orientation:

- Horizontal & Vertical Up (2½" – 10") - Approved by FCCCHR-USC, ASSE, cULus, FM, IAPMO

Materials

Below is a general material list of the Model LF856. All assemblies' size 2½" through 10" is similar in materials and construction. Please contact your local FEBCO Representative if you require further information.

Main Valve Body:	Ductile iron Grade 65-45-12
Coating:	Fusion epoxy coated internal and external AWWA C550
Shutoff Valves:	OS&Y resilient wedge gate valves AWWA C515 (UL/FM)
Check Seats:	Stainless Steel
Disc Holder:	Stainless Steel
Elastomer Disc	Silicone
Spring:	Stainless Steel
Clamp:	AWWA C606 (10" Only)

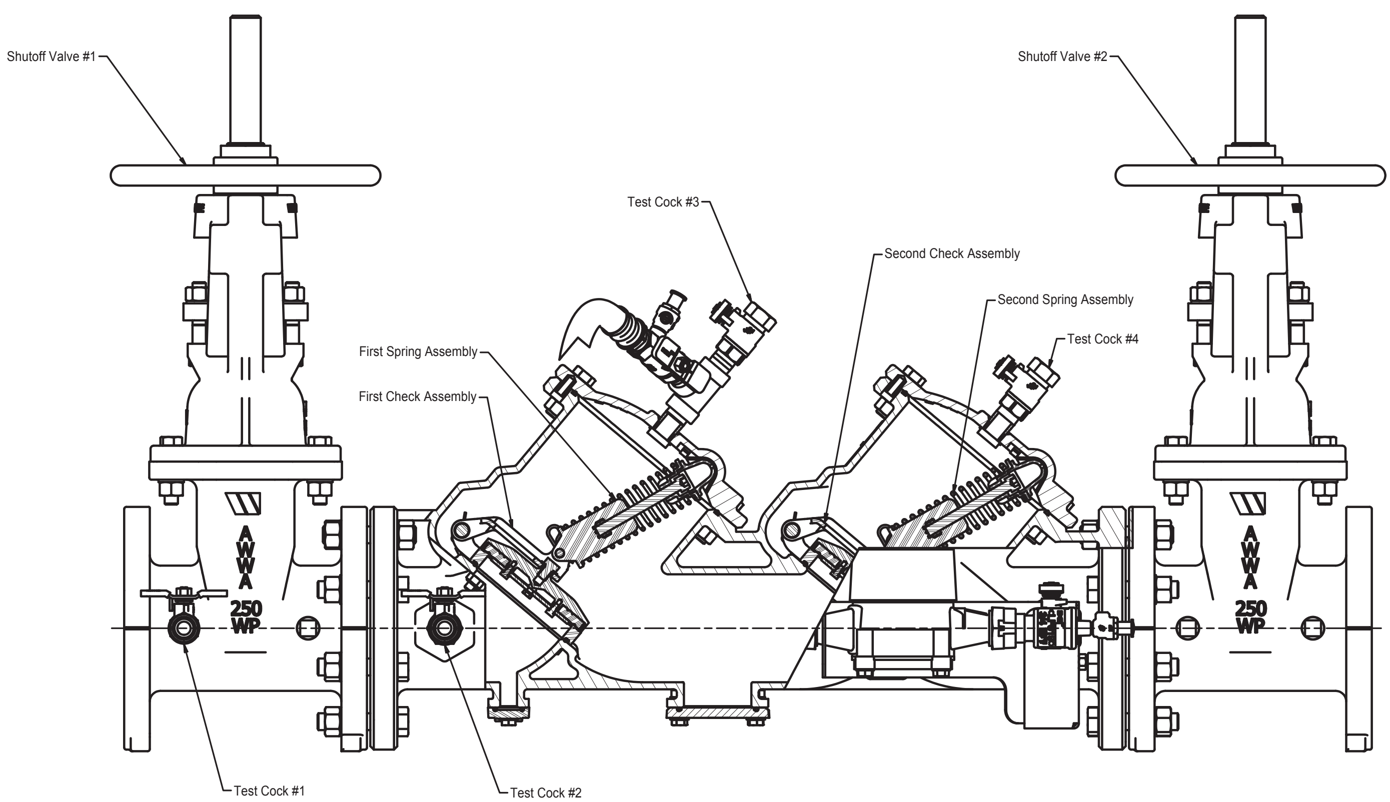
Approvals

- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at The University of Southern California (FCCCHR-USC)
- ASSE 1048 Listed
- **UL Classified (US & Canada)
- **FM Approved
- IAPMO
- AWWA Standard C510 Compliant
- End Connections: Compliant to ASME B16.1 Class 125 & AWWA Class D Flange

**Assembly configured with UL/FM Approved OS&Y RW Gate Valves. Less gate valve assemblies are not UL/FM approved configurations.

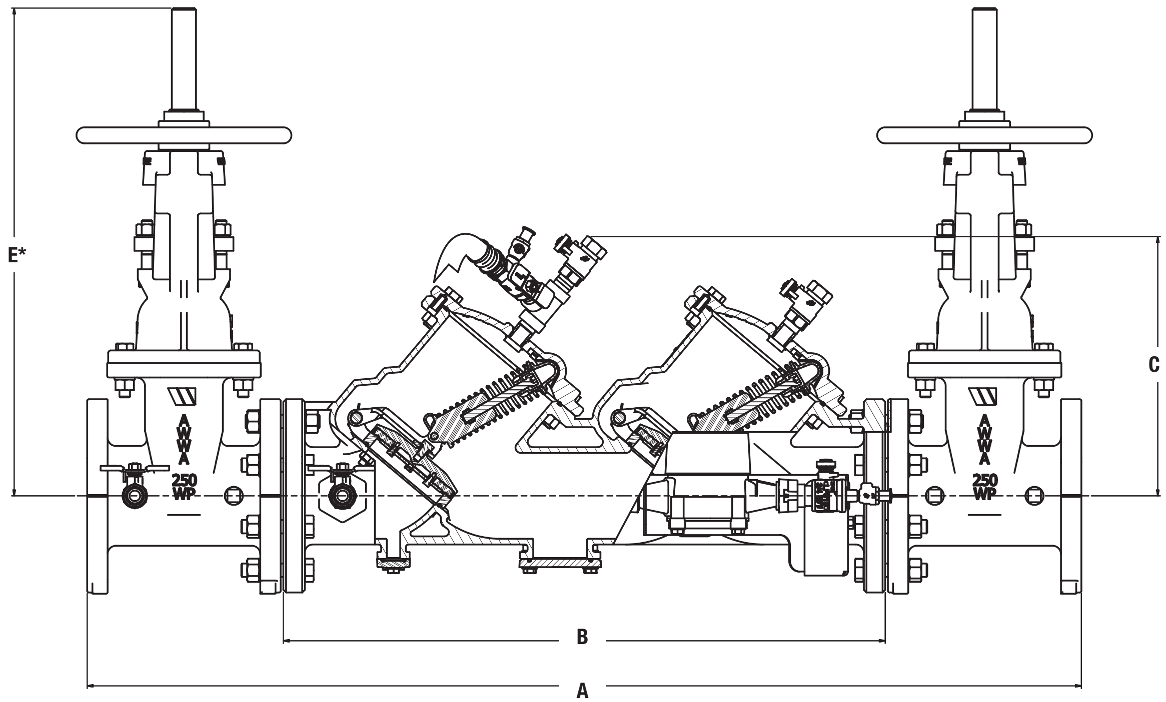
Pressure - Temperature

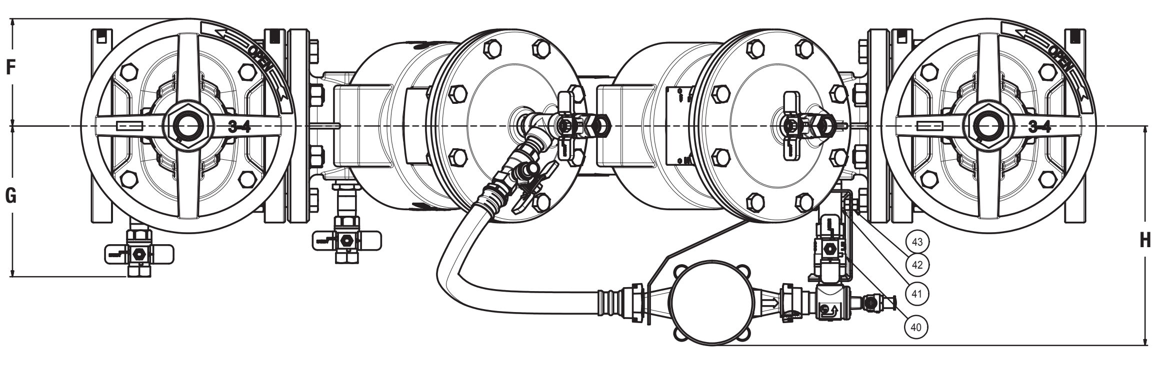
Max. Working Pressure:	175 psi (12.1 bar)
Min. Working Pressure:	10 psi (0.7 bar)
Hydrostatic Test Pressure:	350 psi (24.1 bar)
Hydrostatic Safety Pressure:	700 psi (48.3 bar)
Temperature Range:	33°F - 140°F (0.5°C- 60°C) Continuous



Dimensions & Weights

Below are the nominal dimensions and physical weights for the Model LF856 size 2½" through 10". Allowances must be made for normal manufacturing tolerances. Please visit our website to download a copy of this product's installation instructions, or contact your local FEBCO Representative for more information.





Model LF856 Assemblies

SIZE	DIMENSIONS														WEIGHT***	
	A		B		C		E**		F		G		H		OSY	
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs.*	*kg.*
2½	40¾	1035	25½	648	10	254	16⅜	416	4½	114	7⅛	181	13⅜	340	245	111
3	41⅞	1064	25⅝	651	10	254	22⅐	565	4½	114	7⅜	187	13⅜	340	271	123
4	46¼	1175	28	711	10⅛	257	23¼	591	5½	140	8⅛	206	14	356	338	153
6	56	1422	34¾	883	12¾	324	30⅛	765	6½	165	9⅞	251	15	381	515	234
8	65	1651	41¾	1061	15⅝	397	37¾	959	7	178	11⅛	283	15¾	400	826	375
10	72⅝	1845	46⅜	1178	15⅝	397	48	1219	9	229	12⅜	314	15¾	400	1234	560

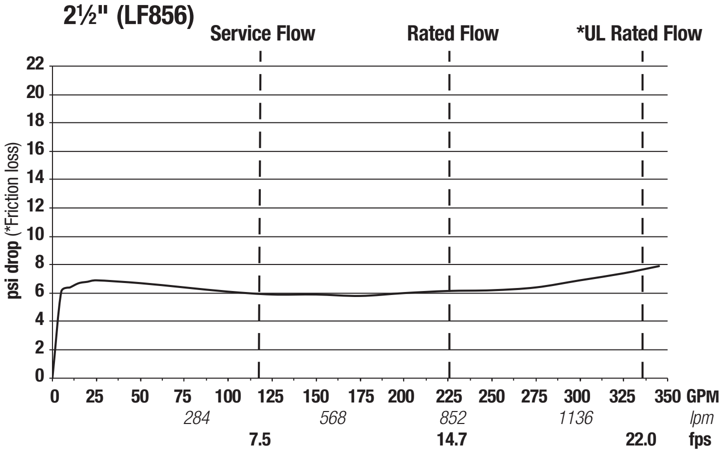
** Indicates nominal dimensions with OSY Gate Valves (Full Open Position)
*** Indicates weight of complete Backflow Assemblies with specified Gate Valves

Performance

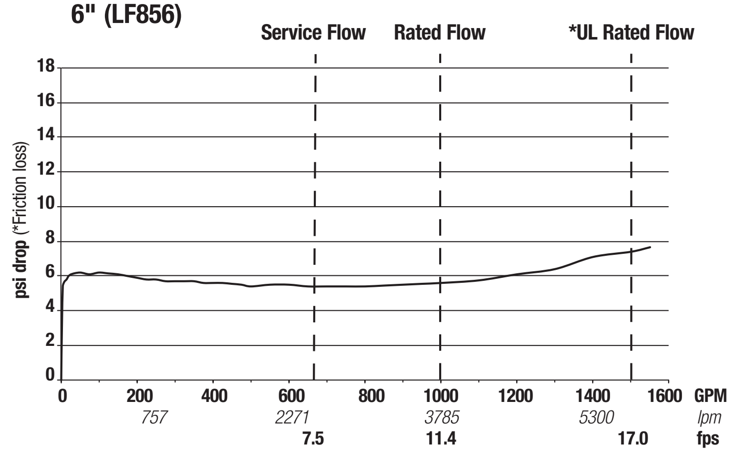
Flow capacity chart identifies valve performance based upon rated water Velocity up to 20fps.

- Maximum service flow rate is determined by maximum rated Velocity of 7.5fps.
- AWWA Manual M-22 (Appendix C) recommends that the maximum water Velocity in the services be not more than 10fps.
- UL flow rate is determined by typically rated Velocity of 15 feet/sec.

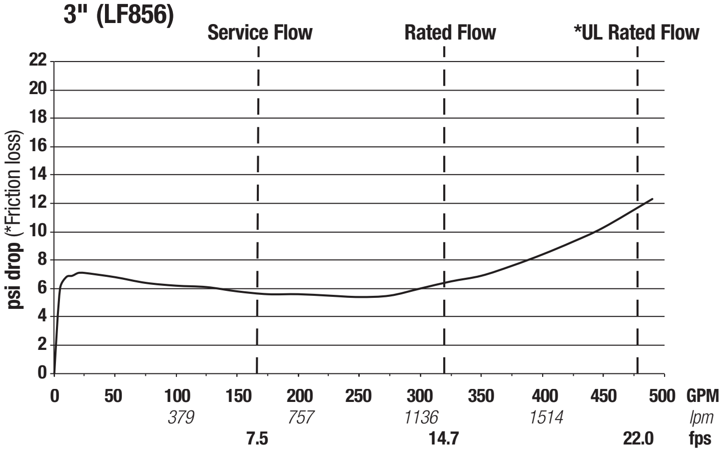
2½" (LF856)



6" (LF856)



3" (LF856)



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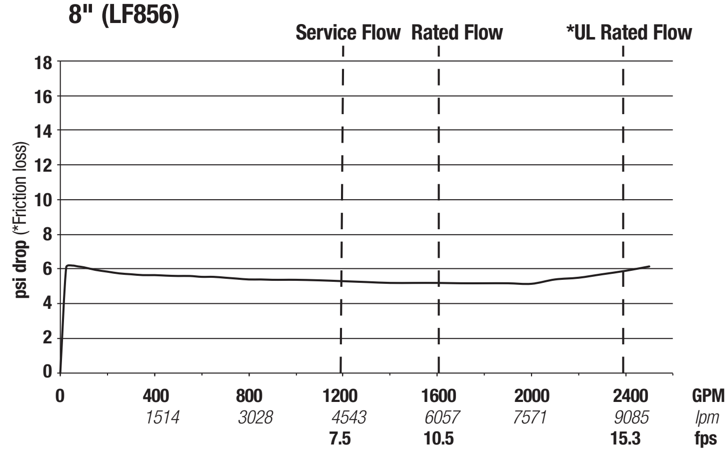
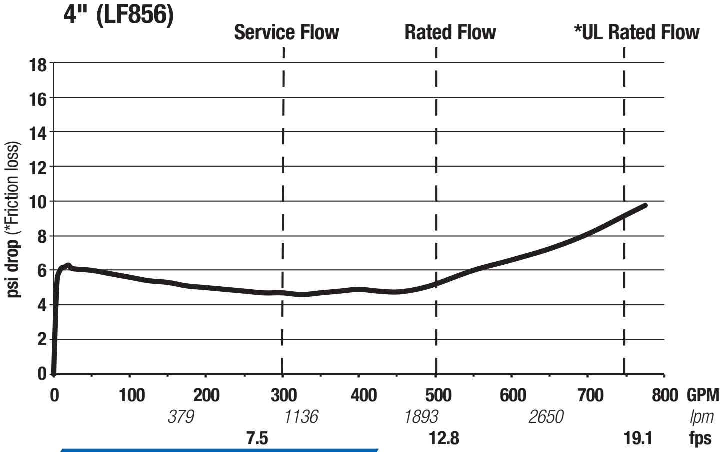
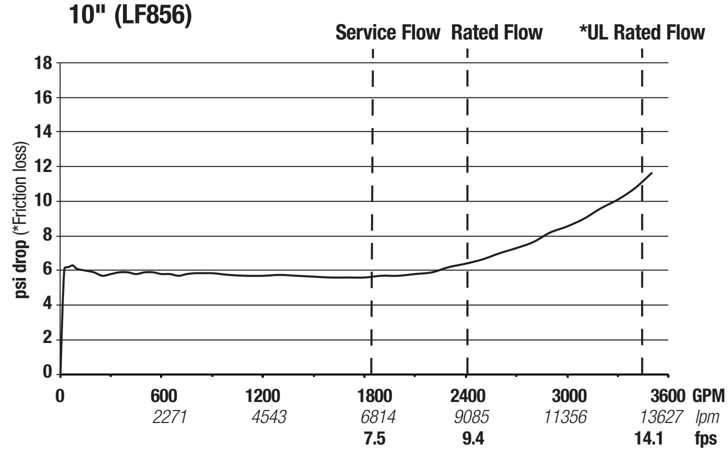


4" (LF856)



10" (LF856)



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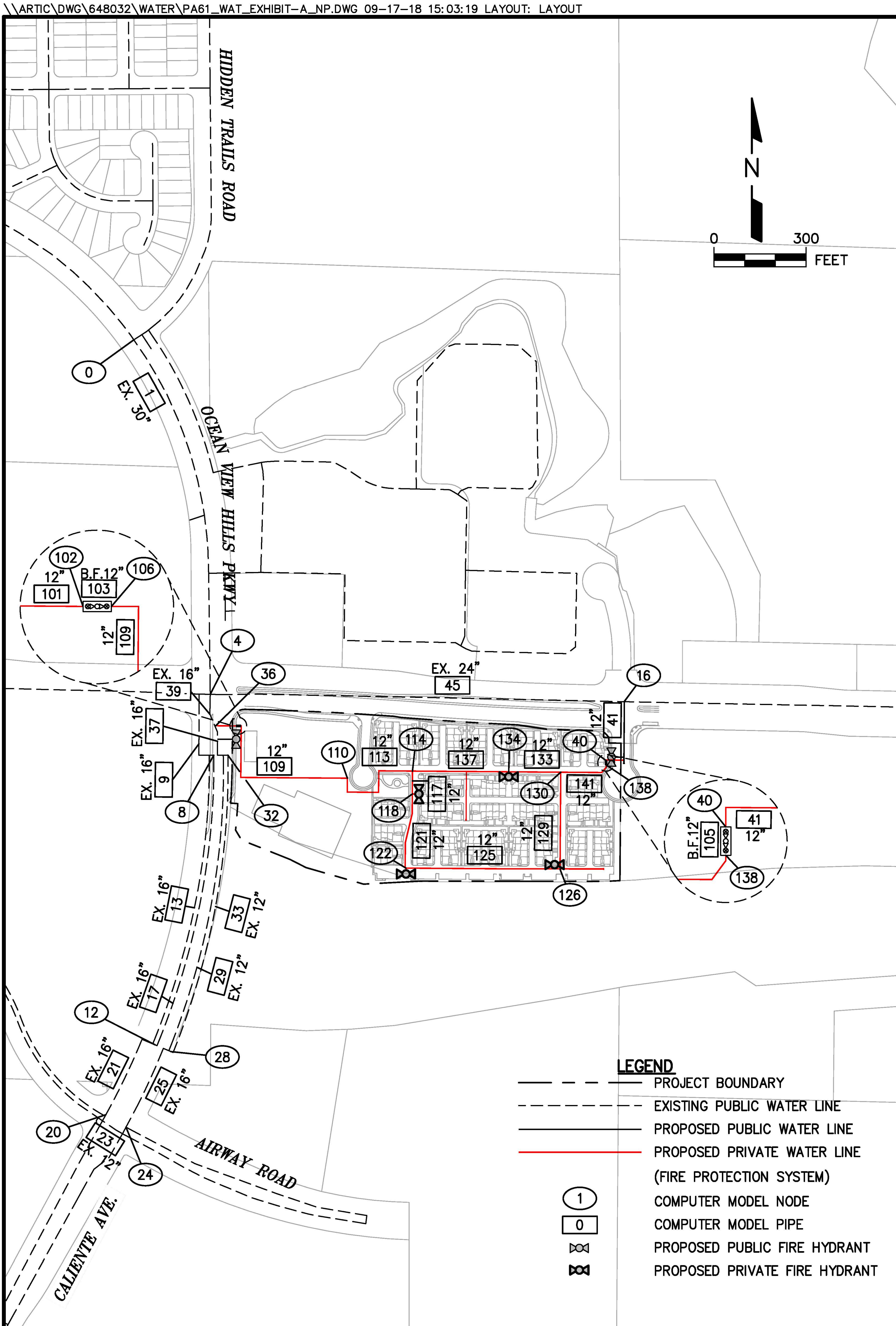

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

EXHIBIT A

NODE AND PIPE DIAGRAM

PA61

RECON

An Employee-Owned Company

July 9, 2018

Mr. Jimmy Ayala
Division President
Pardee Homes
13400 Sabre Springs Parkway, Suite 200
San Diego, CA 92128

Reference: Western Burrowing Owl Non- Breeding Survey Results at the PA-61 Project Survey Area (RECON Number 4135-1)

Dear Mr. Ayala:

This letter summarizes the results of the 2017-2018 non-breeding season surveys for the western burrowing owl (*Athene cunicularia hypugaea*) conducted within the PA-61 Project Area (project site). The project site is located in the city of San Diego, south of Otay Mesa Road, north of State Route 905 (SR-905), and east of the Caliente Avenue (Figures 1 to 4). The project site is found in Section 35, Township 18 South, Range 1 West, of the U.S. Geological Survey 7.5-minute topographic map, Otay Mesa quadrangle (see Figure 2; USGS 1996), and City of San Diego, Engineering and Development, City 800' scale map, Number 146-1761 (see Figure 3). It lies on assessor's parcel number 645-080-16-00, as shown on Figure 4.

RECON Environmental, Inc. biologists conducted non-breeding season western burrowing owl protocol surveys within suitable habitat in accordance with the guidelines developed by the California Department of Fish and Wildlife (CDFW; 2012). Non-breeding season surveys were conducted to determine the presence or absence of the species within the project site and a 150-meter buffer, and no burrowing owls were detected. A discussion of the results of the conducted surveys is provided below.

Western Burrowing Owl

The western burrowing owl is a CDFW species of special concern. This species is primarily restricted to the western United States and Mexico. A year-round resident in San Diego County, breeding western burrowing owls remain in five primary areas in San Diego County: Otay Mesa, Imperial Beach, Naval Air Station North Island, Warner Valley, and Borrego Valley (Unitt 2004). Habitat for the western burrowing owl includes dry, open, short-grass areas with level to gentle topography and well-drained soils (CDFW 2012). These areas are also often associated with burrowing mammals (Haug et al. 1993). Western burrowing owls are known to use multiple burrows, called "satellite" burrows, in addition to their nesting burrows. These non-nesting burrows are used to seek protection from predators and for roosting during the non-breeding season (CDFW 2012).

The western burrowing owl is diurnal and typically perches during daylight at the entrance to its burrow or on adjacent structures, such as low posts. Nesting occurs from March through August. Western burrowing owls form a pair bond for more than one year and exhibit high site fidelity, reusing the same burrow year after year (Haug et al. 1993). The female remains inside the burrow during most of the egg laying and incubation period and is fed by the male throughout brooding. Western burrowing owls are opportunistic feeders, consuming a diet that includes arthropods, small mammals, and birds, and occasionally amphibians and reptiles (Haug et al. 1993).

Urbanization has greatly reduced the amount of suitable habitat for this species. Other contributions to the decline of this species include the poisoning of fossorial mammals, road and ditch maintenance, and collisions with automobiles (CDFW 2012).

Survey Methods

RECON biologists Mandy Weston and Jamie Sue McBee conducted western burrowing owl non-breeding season surveys in accordance with the guidelines developed by the CDFW (CDFW 2012). Wildlife databases, including California Natural Diversity Database (CNDDB) and San Diego Biological Information and Observation System (SanBIOS), were consulted and available information of known western burrowing owl observations was gathered and compared to the parcel location. No previous records were found for the project site within the wildlife databases.

The current surveys included four non-breeding season western burrowing owl surveys. For the purposes of this report, the "survey area" includes the project's proposed ground disturbance footprint (project site) and a 150-meter buffer (see Figure 4). Meandering transects were walked through all suitable habitat identified within the project site. The 150-meter buffer was surveyed using binoculars, as access onto private property was not granted. All wildlife species observed during the surveys were noted. Survey dates, times, and weather conditions are provided in Table 1.

Vegetation community classifications in this report follow Oberbauer et.al. (2008), which is based on Holland (1986). It should be noted that vegetation community classifications should follow Sawyer et al. (2009) per the CDFW guidelines; however, Sawyer et al. (2009) does not contain a vegetation classification equivalent for disturbed land, an on-site land cover type.

Table 1
Survey Information

Date	Survey Type	Surveyors	Beginning Conditions	Ending Conditions
11/20/2017	Western Burrowing Owl Survey #1	M. Weston	7:15 a.m.; 50°F; 0–2 mph; 10% cc	10:00 a.m.; 68°F; 0–2 mph; 10% cc
12/12/2017	Western Burrowing Owl Survey #2	M. Weston, J. McBee	7:30 a.m.; 56°F; 0–2 mph; 0% cc	9:30 a.m.; 77°F; 0–2 mph; 0% cc
1/10/2018	Western Burrowing Owl Survey #3	M. Weston, J. McBee	3:00 p.m.; 59°F; 1–4 mph; 60% cc	4:10 p.m.; 59°F; 1–3 mph; 25% cc
1/31/2018	Western Burrowing Owl Survey #4	M. Weston, J. McBee	7:30 a.m.; 60°F; 0–3 mph; 0% cc	9:00 a.m.; 68°F; 1–3 mph; 0% cc

°F = degrees Fahrenheit; mph = miles per hour; % = percent; cc = cloud cover.

Existing Conditions

The project site consists of an undeveloped lot surrounded by State Route 905 to the south, Otay Mesa Road to the north, Caliente Avenue to the west, and undeveloped, private land to the east (see Figure 4). The 47.29-acre project site consists of a previously graded area and detention basin, and is highly disturbed. There are no records for observation of burrowing owl within the project site. One recent nesting burrowing owl observation occurred in 2017 approximately 2.5 miles east of the project site (State of California 2018).

Four soil types occur within the project area: Olivenhain cobbly loam, 2 to 9 percent slopes; Olivenhain cobbly loam, 30 to 50 percent slopes; Olivenhain cobbly loam, 9 to 30 percent slopes; and Stockpen gravelly clay loam, 2 to 5 percent slopes (USDA 1973). No sign of recent disking was observed within the project site.

The project site is entirely fenced with chain link and is relatively flat with earthen berms around the eastern and southern perimeters. The project site supports one land cover type: disturbed land (Figure 5). The disturbed land is dominated by Russian thistle (*Salsola tragus*), and other species present include red brome (*Bromus madritensis*), Australian saltbush (*Atriplex semibaccata*), crystalline iceplant (*Mesembryanthemum crystallinum*), and stinkwort (*Dittrichia graveolens*; Photographs 1 and 2). The majority of the site is comprised of a dense layer of Russian thistle, which ranges from one foot to three feet in height. In patches where the land is more open, red brome is dominant and the structure is approximately six to 12 inches in height.

The 150-meter buffer surrounding the project site is comprised of disturbed land and urban/developed land. Disturbed land dominated by Russian thistle, red brome, and Australian saltbush occurs adjacent to the project site to the east, and the structure is similar to that of the project site. Otay Mesa Road occurs to the north of the project site, and a developed area with multi-family residences occurs beyond Otay Mesa Road. An empty lot comprised of bare ground and disturbed land dominated by sow-thistle species (*Sonchus* sp.) and Russian thistle occurs to the northwest of the project site. Caliente Avenue occurs to the west of the project site, and a private lot comprised of disturbed land dominated by Russian thistle, red brome, and Australian saltbush occurs beyond Caliente Avenue. SR-905 occurs to the south of the project site, and a small patch of disturbed land dominated by Russian thistle and red brome occurs beyond SR-905 to the southeast of the project site.

Non-Breeding Season Western Burrowing Owl Surveys Results

Non-breeding season western burrowing owl surveys were conducted on four separate dates: November 20, 2017; December 12, 2017; January 10, 2018; and January 31, 2018. Three of the surveys were conducted between morning civil twilight and 10:00, and one survey was conducted between two hours prior to sunset and evening civil twilight. Meandering transects were walked through all suitable habitat identified within the project area. The 150-meter buffer was surveyed using binoculars. No burrowing owls were detected during the surveys. A burrow complex comprised of seven burrows was observed within the eastern portion of the site during the first survey on November 20 (see Figure 5); however, on the second and subsequent surveys, these burrows appeared to have been dug out and/or collapsed by predators. During the third and fourth surveys, several newly excavated burrows were observed within the same area, indicating that fossorial mammals are present within the project site. At the time of the surveys, no burrowing owl sign (e.g., cast pellets, prey remains, molted feathers, excrement at burrow entrances, etc.) was detected within or near the burrows.

Conclusion and Mitigation Requirements

Although western burrowing owls were not detected within the project site during these focused non-breeding season surveys, there is a moderate potential for this species to occur within the western portion of the project site, as the habitat is less dense and suitable burrows are present. Within the rest of the project site, there is low potential for burrowing owl to occur due the density and height of the Russian thistle. The disturbed land within the buffer to the west and to the east of the project site also has a moderate potential for this species. The closest recent observation of nesting burrowing owls occurred in 2017 approximately 2.5 miles east of the project site. Per the 2012 CDFW protocol guidelines, "Visits to the site in more than one year increases the likelihood of detection and failure to locate burrowing owls during one field season does not constitute evidence that the site is no longer active." As this project site is located within Otay Mesa, an area known to support burrowing owl, the City of San Diego may require pre-construction take avoidance surveys within 14 days prior to initiating ground disturbance activities. If construction activities do not commence before the 2019 burrowing owl breeding season of February 1 through August 31, additional surveys may be required, preferably during the peak breeding season of February 15 through July 15 (CDFW 2012). No additional mitigation is required at this time.

If you have any questions concerning the contents of this letter, please contact me (mweston@reconenvironmental.com; 619-308-9333 extension 153) or Lori Spar (lspar@reconenvironmental.com; 619-308-9333 extension 110).

Sincerely,

A. Weston

Mandy Weston
Biologist

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Project Location

FIGURE 1

Regional Location of the Planning Area 61 Survey Area

RECON

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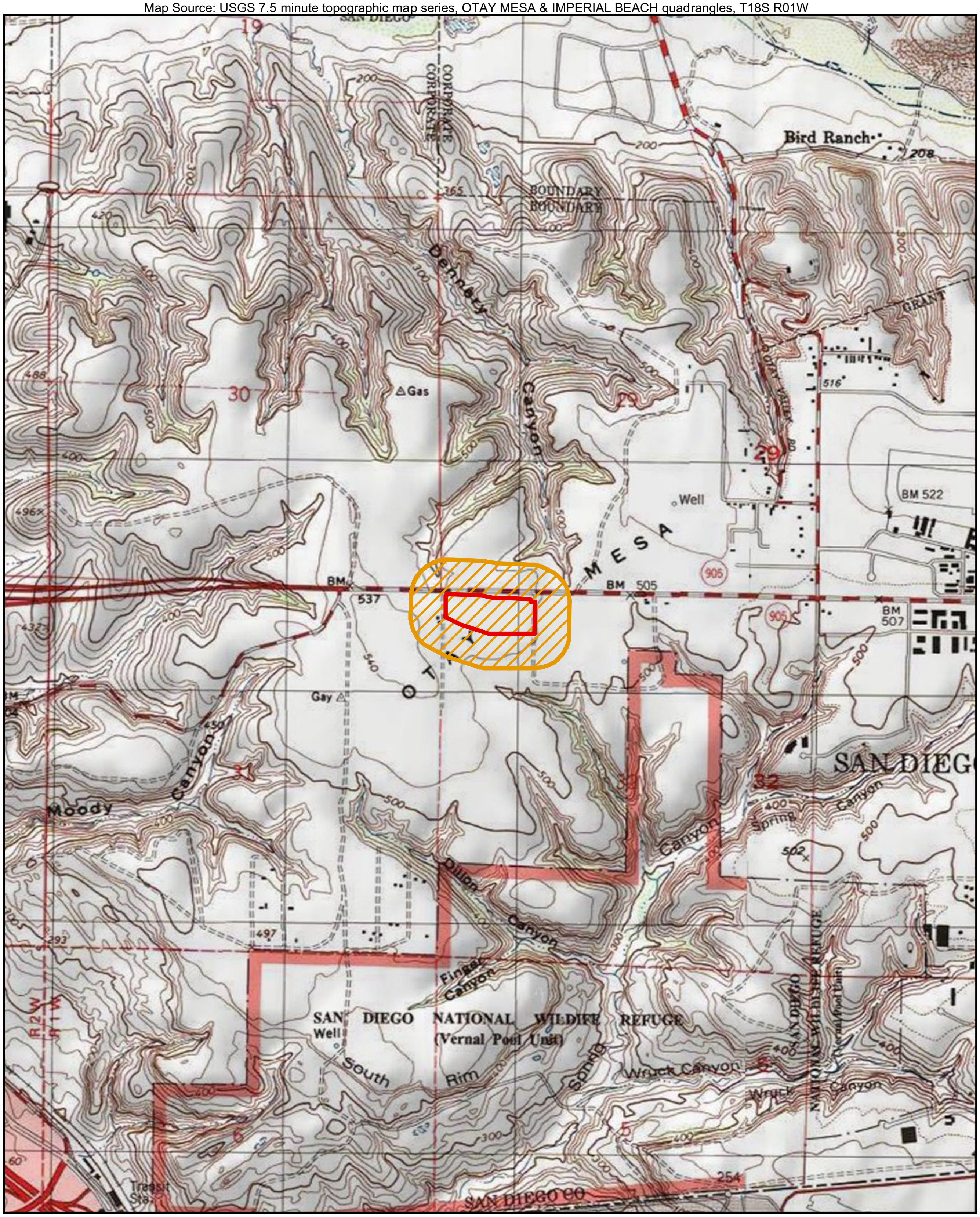
Map Source: USGS 7.5 minute topographic map series, OTAY MESA & IMPERIAL BEACH quadrangles, T18S R01W



Planning Area 61

Survey Area

FIGURE 2

Planning Area 61 Survey Area on USGS Map

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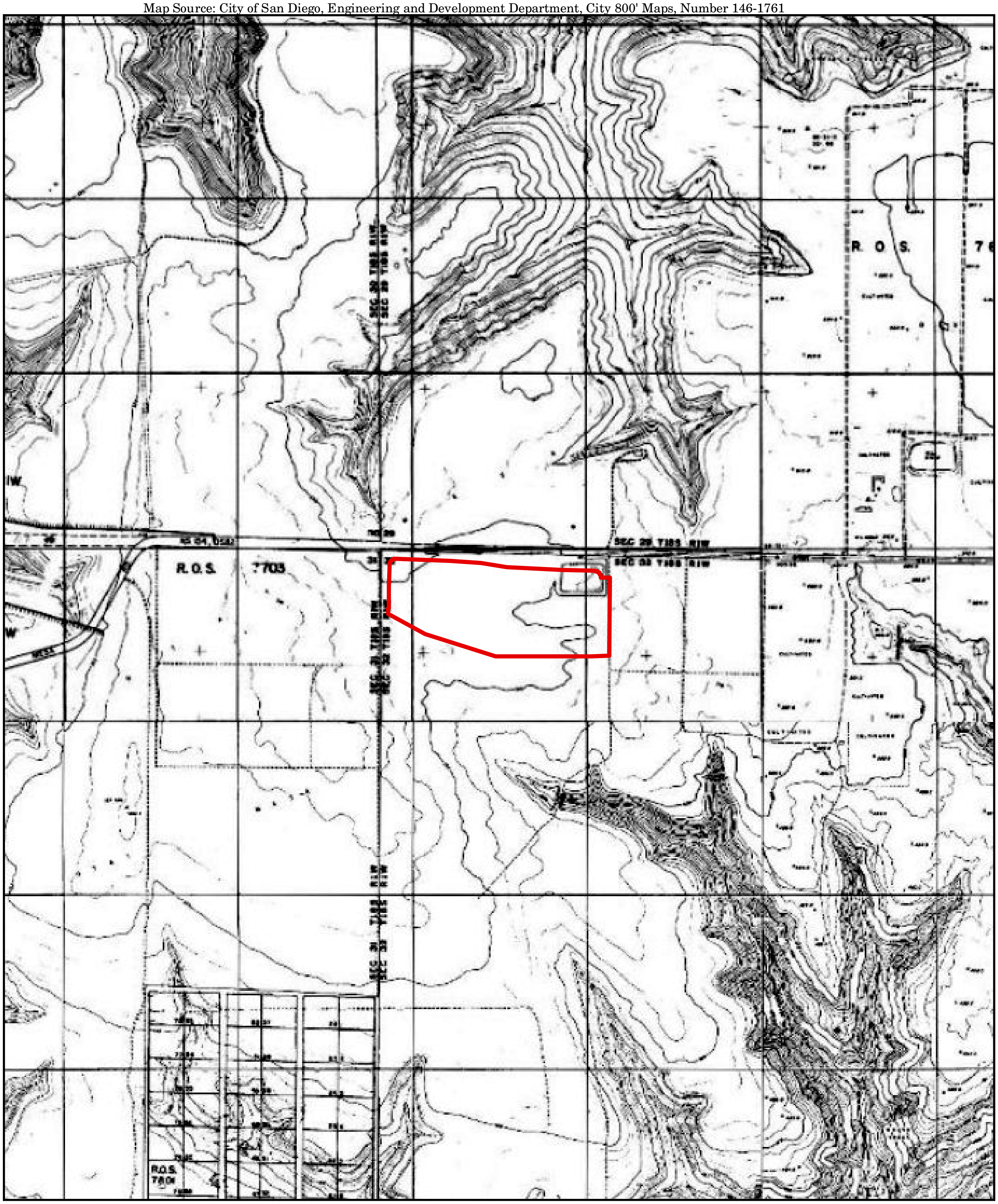
Map Source: City of San Diego, Engineering and Development Department, City 800' Maps, Number 146-1761



0 Feet 800

Planning Area 61

FIGURE 3

Planning Area 61 Survey
Area on City 800' Scale Map

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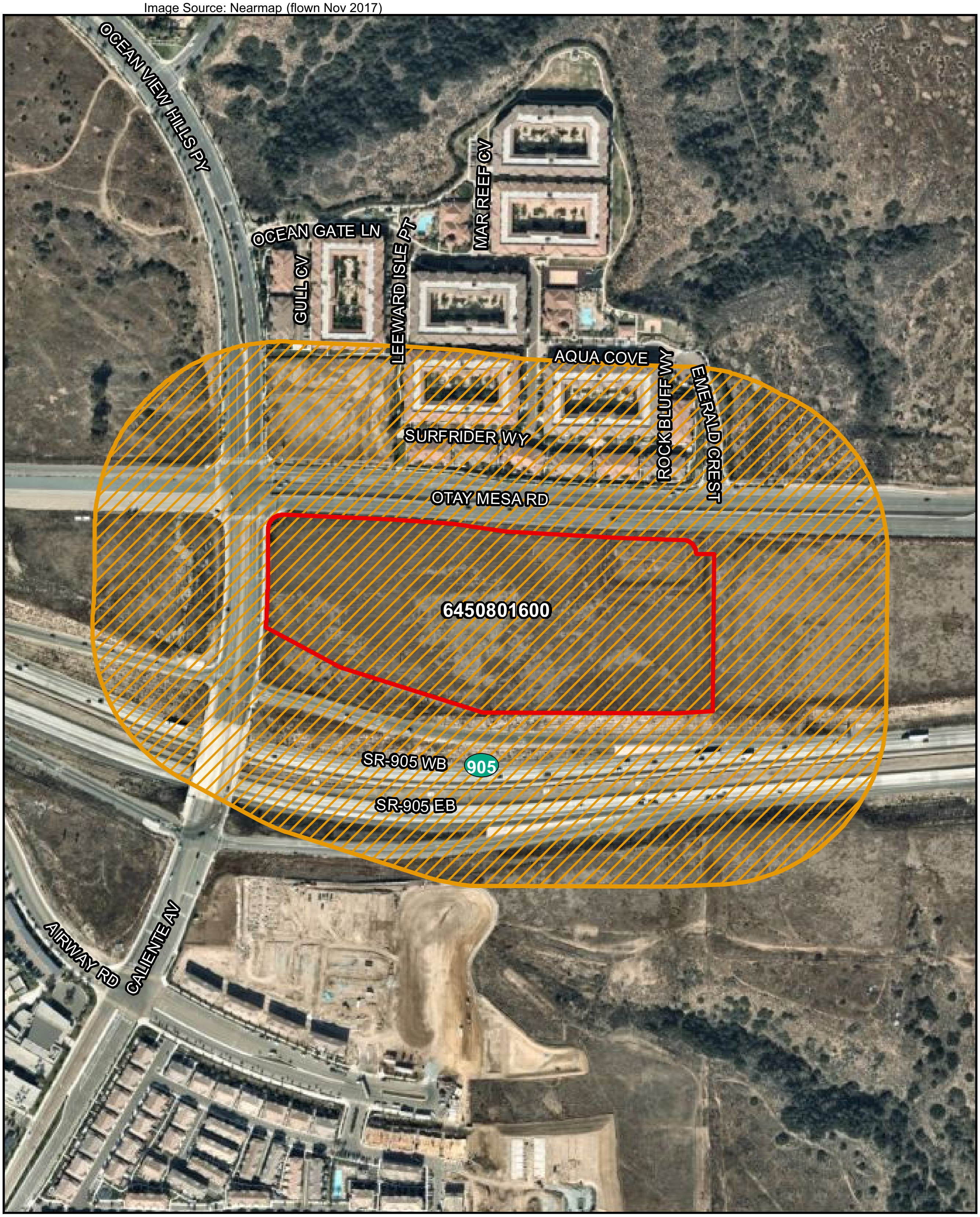
Image Source: Nearmap (flown Nov 2017)



0 Feet 400

Planning Area 61

Survey Area

FIGURE 4

Planning Area 61 Survey Area on Aerial Photograph

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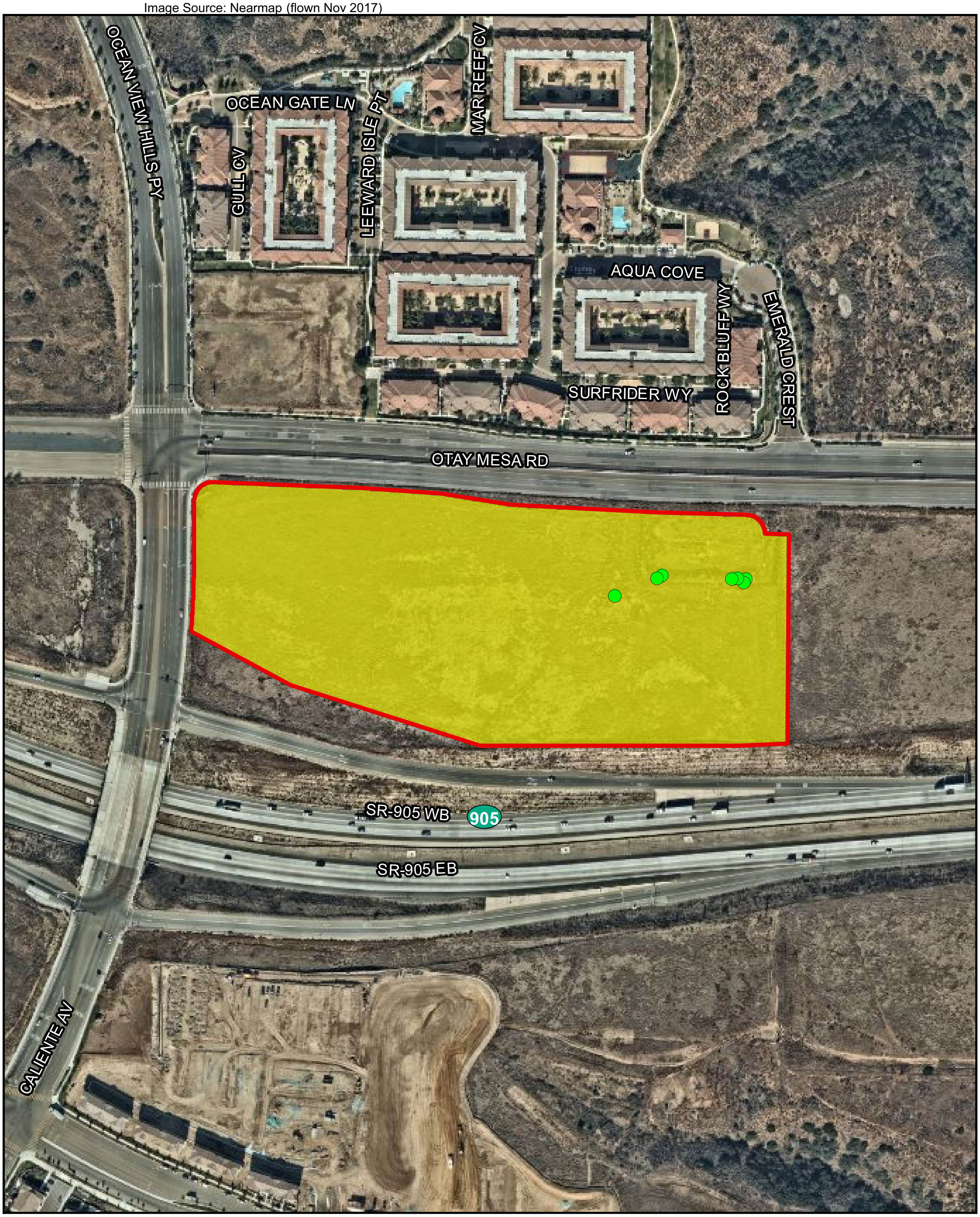
Image Source: Nearmap (flown Nov 2017)



Planning Area 61

Disturbed Land

Burrows

0 Feet 300

FIGURE 5

Vegetation Communities within the Planning Area 61 Parcel

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PHOTOGRAPH 1
View of Project Site Looking East
Photo Taken December 12, 2017

PHOTOGRAPH 2
View of Project Site Looking West
Photo Taken December 12, 2017

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